



TAGORE MEDICAL COLLEGE & HOSPITAL

Rathinamangalam, Melakkottaiyur Post, Chennai - 600127.

Phone : 044-30101111, Fax : 044-222 5555, Email: tagoremch@gmail.com



(Affiliated to the Tamil Nadu Dr.MGR Medical University & Recognized by the Ministry of Health & Family welfare. Govt. of India New Delhi)

Year	Name of the Department (UG)	Lab Postings (Practicals)
I	Anatomy	Anatomy Lab
	Physiology	Physiology Lab
	Bio chemistry	Bio chemistry Lab
II	Pathology	Pathology Lab
	Pharmacology	Pharmacology Lab, Animal house and Herbal garden
	Microbiology	Microbiology Lab
III	ENT	Skill Lab
	Community Medicine	Community Medicine practical lab/ Clinical postings
	Obstetrics & Gynaecology	Skill lab & Bedside clinics
	General Surgery	Skill lab & Bedside clinics
	Anesthesia	Skill lab & Bedside clinics
	Orthopaedics	Bedside clinics
	Paediatrics	Bedside clinics
	General Medicine	Bedside clinics
CRMI		Microbiology, Virology, pathology and Biochemistry labs (Elective postings)

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S.No	Department Name (PG)	Practicals
1	M.D. Anaesthesia	Lab posting/Skills lab
2	M.D Community Medicine	Hospital postings
3	M.D Pathology	Lab posting
4	M.D Radiodiagnosis	Lab posting/Elective posting
5	M.S Orthopaedics	Laboratory work/ Clinical postings
6	M.S General Surgery	Skill lab/ Practical posting Clinical postings
7	M.S OBG	Clinical postings
8	M.S Ophthamology	Clinical postings
9	M.S ENT	Clinical postings

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CHENNAI-600 127.

**THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY,
CHENNAI – 600 032.**

**M.B.B.S. DEGREE COURSE
REVISED REGULATIONS - 2016**


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
CHENNAI-600 127.

**THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY
CHENNAI**

REVISED REGULATIONS FOR THE M.B.B.S DEGREE COURSE- 2016

In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr. M.G.R. Medical University, Chennai, Act, 1987 (Tamil Nadu Act 37 of 1987), the Standing Academic Board of the Tamil Nadu Dr. M.G.R. Medical University hereby makes the following regulations:

SHORT TITLE AND COMMENCEMENT:

These regulations shall be called "THE REVISED REGULATIONS FOR THE M.B.B.S. DEGREE COURSE- 2016 OF THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI".

These regulations are applicable to the students who are admitted to the course from the academic year 2016-17 onwards.

The regulations framed are subject to modification by the Standing Academic Board from time to time.

1 GENERAL CONSIDERATIONS AND TEACHING APPROACH

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.

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

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1.3 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.

1.4 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.

1.5 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.

1.6 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.

1.7 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.

1.8 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.

1.9 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.

1.10 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.

1.11 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.

1.12 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.

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

1.14 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.

1.15 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.

1.16 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.

1.17 Faculty member should aware 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.

1.18 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 1/2 years Bachelor of Medicine and Bachelor of Surgery (MBBS) Course.

1.19 In order to implement the revised curriculum in toto, respective authorities must ensure that adequate financial and technical inputs are provided.

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

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

1.22 Integration of ICT in learning process will be implemented.

2. ADMISSION TO THE MEDICAL COURSE - ELIGIBILITY CRITERIA :

No Candidate shall be allowed to be admitted to the Medical Curriculum proper of first Bachelor of Medicine and Bachelor of Surgery (MBBS) Course until:

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

2.2 HE/SHE HAS PASSED QUALIFYING EXAMINATION AS UNDER :-

(a) The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of Physics, Chemistry, Biology/Bio-technology and Mathematics or any other elective subjects with English at a level not

less than core course of English as prescribed by the National Council of Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education;

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

Or

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

Or

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

Or

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

Or

(e) B.Sc. examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects Physics,

Chemistry, Biology (Botany,Zoology)/Bio-technology and further that he/she has passed the earlier qualifying examination with the following subjects – Physics, Chemistry, Biology and English.

Or

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

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

2.3 There shall be a uniform National Eligibility-cum-Entrance Test for admission to the Under-graduate courses in each academic year conducted in the manner, as prescribed by the National Board of Examination or any other authority appointed by the Central Government on their behalf. The overall superintendence, direction and control of the National Eligibility-cum-Entrance Test shall vest with the Central Council.

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

3. ELIGIBILITY CERTIFICATE:

Candidates who have passed any qualifying examination other than the Higher Secondary course examination conducted by the Government of Tamil Nadu shall obtain an eligibility certificate from the University by remitting the prescribed fee along with the application form before seeking admission to any one of the affiliated Medical Institutions. The application form and the details for obtaining Eligibility Certificate may be downloaded from the University website: www.tnmgrmu.ac.in.

4. REGISTRATION OF CANDIDATES:

A candidate admitted in M.B.B.S. degree course in any of the affiliated Institution of this University shall register his / her name by submitting the prescribed application form for Registration duly filled along with the prescribed fee and a declaration in the format to the Controller of Examination of this University through the Head of the affiliated Institutions within 30 days from the cut-off date prescribed for M.B.B.S. course for admission.

The University shall not register any candidate admitted beyond the cut-off date of 31st of August of respective academic year.

5. TRAINING PERIOD AND TIME DISTRIBUTION:

5.1. Training Period and Time Distribution (1) Every student shall undergo a period of certified study extending over 4 ½ academic years divided into 9 semesters,(i.e. of 6 months each) from the date of commencement of his study for the subjects comprising the medical curriculum to the date of completion of the examination and

followed by one year compulsory rotating internship. Each semester will consist of approximately 120 teaching days of 8 hours each college working time, including one hour of lunch.

5.2. The period of 4 ½ years is divided into three phases as follows :-

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

b) Phase-II (3 semesters) - consisting of para-clinical/ clinical subjects. During this phase teaching of para-clinical and clinical subjects shall be done concurrently. The para-clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine.

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

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

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

The clinical subjects to be taught during Phase II & III are Medicine and its allied specialties, Surgery and its allied specialties, Obstetrics and Gynaecology and Community Medicine. Besides clinical posting as per schedule mentioned herewith, rest of the teaching hours be divided for didactic lectures, demonstrations, seminars, group discussions etc. in various subjects. The time distribution shall be

as per guidelines of Medical Council of India.

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

5.3. The first 2 semester (approximately 240 teaching days) shall be occupied in the Phase I (Pre-clinical) subjects and introduction to a broader understanding of the perspectives of medical education leading to delivery of health care. No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he has passed in all the Phase I (Pre-clinical subjects).

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

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

5.5 Didactic lectures should not exceed one third of the time schedule; two third schedule should include practicals, clinicals or/and group discussions.

Learning process should include live experiences, problem oriented approach, case studies and community health care activities.

5.6 The admission process in such a way that teaching in first semester starts by 1st of August each year. For this purpose, they shall follow the time schedule as per guidelines of Medical Council of India. There shall be no admission of students in

respect of any academic session beyond 31st August under any circumstances. The University shall not register any student admitted beyond the said date. Any student identified as having obtained admission after the last date for closure of admission be discharged from the course of study.

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

6. CURRICULUM AND SYLLABUS

The curriculum and the syllabi for the course shall be as specified in these regulations.

7. COMMENCEMENT OF THE COURSE:

From 1st August of the Academic year.

8. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examinations.

9. UNIVERSITY EXAMINATIONS:

9.1 COMMENCEMENT OF EXAMINATION:

- a) August 1st/February 1st.
- b) Theory examinations not to be held on Saturdays and Sundays. If the date of commencement of the examination falls on a public holiday, the next working day will be the date of commencement of examination.

9.2 ESSENTIALITIES FOR QUALIFYING TO APPEAR IN PROFESSIONAL EXAMINATIONS:

9.2.1 ATTENDANCE

- A) No candidate shall be permitted to anyone of the parts of MBBS examinations unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognised by this University and produces the necessary attendance and progress from the Head of the Institution.
- B) 75% attendance in a subject for appearing in the examination is compulsory inclusive of attendance in non-lecture teaching i.e. seminars, group discussions, tutorials, demonstrations, practicals, hospital (Tertiary Secondary, Primary) posting and bed side clinics etc.
- C) Attendance earned by the student should be displayed on the Notice Board of the College at the end of every 3 months and a copy of the same should be sent to the University and parents of the student concerned.

9.2.2 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.
- (iii) Day to day records should be given importance during internal assessment :
- (iv) Weightage for the internal assessment shall be 20% of the total marks in each subject :

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

Note:

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

Some of the 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). Proficiency in carrying out a practical or a skill in small research project.
- (v) Multiple choice questions (MCQ) test after completion of a system/teaching.
- (vi) Each item tested shall be objectively assessed and recorded. Some of the items can be assigned as Home work/Vacation work.

9.2.3 Practical/clinical exercises 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.

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

9.2.5 The examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary 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.

9.2.6 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. University 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, Pharmacology and Forensic Medicine.

Third Professional:-

Part 1- in the Seventh Semester of Phase III, in the subjects of Ophthalmology, Otorhynolaryngology and Community Medicine.

Third Professional :-

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

8. Phase Distribution and Timing of Examinations:-

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

Note:

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

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

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

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

TABLE

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

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

This posting includes training in Radiodiagnosis and Radiotherapy where existant.

This posting includes exposure to Rehabilitation and Physiotherapy.

This posting includes exposure to laboratory medicine and infectious diseases.

his 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.

10. RE-ADMISSION AFTER BREAK OF STUDY:

As per the procedure laid down in a common Regulation for the Under-Graduate courses of this University.

11. MIGRATION:

11.1 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.

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

11.3 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.

11.4 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 which that college is affiliated. He/She shall submit his application for migration within a period of 1 month of passing (Declaration of result of the 1st Professional MBBS examination) alongwith the above

cited four “No Objection Certificates” to: (a) the Director of Medical Education of the State, if migration is sought from one college to another within the same State

(or)

(b) the Medical Council of India, if the migration is sought from one college to another located outside the State

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

12. CUT-OFF DATES FOR ADMISSION :

The candidates admitted upto 31st August shall be registered to take up their First year examination during August of the next year and the next examination.

All kinds of admissions shall be completed on or before 31st August of the academic year. There shall not be any admissions after 31st August even if seats are vacant.

13, INTERNSHIP

13.1 General

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

(2) SPECIFICE OBJECTIVES

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

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

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

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

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

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

COMPULSORY

Community Medicine	2 months

Medicine including 15 days of Psychiatry	2 months

Surgery including 15 days Anaesthesia	2 months

Obst./Gynae. including Family	

Welfare Planning	2 months

Paediatrics	1 month

Orthopaedics including PMR	1 month

ENT	15 days
Ophthalmology	15 days
Casualty	15 days
Elective Posting (1x15 days)	15 days

Subjects for Elective posting will be as follows:

- i) Dermatology and Sexually Transmitted Diseases.
- ii) Tuberculosis and Respiratory Diseases.
- iii) Radio-Diagnosis
- iv) Forensic Medicine
- v) Blood Bank
- vi) Psychiatry

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

(5) OTHER DETAILS:

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

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

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

iv) The State Medical Council will grant provisional registration to the candidate on production of the provisional MBBS pass certificate. The provisional registration will be for a period of one year. In the event of the shortage or unsatisfactory work,

the period of provisional registration and the compulsory rotating internship may be suitably extended by the appropriate authorities.

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

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

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

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

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

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

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

x) Out of one year, 6 months shall be devoted to learning tertiary care being rendered in teaching hospital/district hospital suitably staffed with well qualified staff,

3 months of secondary care in a small District or Taluka Hospital/Community Health Centre and 3 months in Primary Health care out of which 2 months should be in Primary Health Programme at the Community level. One month of primary care training may be in the form of preceptorship with a practicing family physician or voluntary agency or other primary health care provider.

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

(6) ASSESSMENT OF INTERNSHIP:

i) The intern shall maintain a record of work which is to be verified and certified by the medical officer under whom he works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training. Based on the record of work and date of evaluation, the Dean/Principal shall issue certificate of satisfactory 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, b) of having assisted in procedures, c) of having observed. SCORE 0-5

(3) Responsibility, punctuality, work up of case, involvement in treatment, follow-up reports. SCORE 0-5

(4) Capacity to work in a team (Behaviour with colleagues, nursing staff and relationship with paramedicals). SCORE 0-5

(5) Initiative, participation in discussions, research aptitude. SCORE 0-5

Poor / Fair / below average / average / above average / excellent

0 1 2 3 4 5

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

(7) Full registration shall only be given by the State Medical Council/Medical Council of India on the award of the MBBS degree by the university or 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:

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

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

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

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

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

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

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

(a) gain full expertise in immunization against infectious disease;

(b) participate in programmes in prevention and control of locally prevalent endemic diseases including nutritional disorders;

(c) learn skills first hand in family welfare planning procedures;

(d) learn the management of National Health Programmes;

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

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

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

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

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

(II) TALUQA HOSPITAL

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

(1) effectively participate with other members of the health team with qualities of leadership;

(2) make a community diagnosis in specific situations such as epidemics and institute relevant control measures for communicable diseases;

(3) develop capability for analysis of hospital based morbidity and mortality statistics.

(4) Use essential drugs in the community with the awareness of availability, cost and side effects;

(5) Provide health education to an individual/community on :

- a) tuberculosis;
- b) small family, spacing, use of appropriate contraceptives;
- c) applied nutrition and care of mothers and children;
- d) immunization;
- e) participation in school health programme.

(III) PRIMARY HEALTH CENTRE

(1) Initiate or participate in family composite health care (birth to death), Inventory of events;

(2) Participation in all of the modules on field practice for community health e.g. safe motherhood, nutrition surveillance and rehabilitation, diarrhea disorders etc.

(3) Acquire competence in diagnosis and management of common ailments e.g. malaria, tuberculosis, enteric fever, congestive heart failure, hepatitis, meningitis acute renal failure etc.;

(4) Acquire proficiency for Family Welfare Programmes (ante natal care, normal delivery, contraception care etc.)

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

(ii) GENERAL MEDICINE

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

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

(2) this would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and system illnesses . (II) The intern shall have assisted as a care team in intensive care of cardiac, respirator, hepatic, neurological and metabolic emergencies.

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

(a) Blood: (Routine haematology smear and blood groups);

(b) Urine: (Routine chemical and microscopic);

(c) Stool: (for ova/cyst and occult blood);

(d) Sputum and throat swab for gram stain or acid fast stain and

(e) Cerebro Spinal Fluid (CSF) for smear.

(IV) Conduct following diagnostic procedures:

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

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

(V) Biopsy Procedures:

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

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

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

(VIII) Other competencies as indicated in general objectives.

(iii) PAEDIATRICS:

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

The intern shall be able to:

(1) diagnose and manage common childhood disorders including neonatal

disorders and acute emergencies(enquiry from parents of sick children), examining sick child making a record of information;

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

(a) diagnostic techniques: blood (including from femoral vein and umbilical cord), abscess, 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) earsyringing 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:

- (1) Subconjunctival injection;
- (2) Ocular bandaging;
- (3) Removal of concretions;
- (4) Epilation and electrolysis;
- (5) Corneal foreign body removal;
- (6) Cauterization of corneal ulcers;
- (7) Chalazion removal;
- (8) Entropion correction;
- (9) Suturing conjunctival tears;
- (10) Lids repair
- (11) Glaucoma surgery (assisted);
- (12) 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, acute osteomyelitis, acute poliomyelitis and common congenital deformities such as congenital talipes equinovarus (CTEV) and dislocation of hip (CDH).

(A) THERAPEUTIC- An intern must know:

(a) Splinting (plaster slab) for the purpose of emergency splintage, definitive splintage and post operative splintage and application of Thomas splint;

(b) Manual reduction of common fractures – phalangeal, metacarpal, metatarsal and Colles's fracture;

(c) Manual reduction of common dislocations – interphalangeal, metacarpophalangeal, elbow and shoulder dislocations;

(d) Plaster cast application for undisplaced fractures of arm, forearm, leg and ankle;

(e) Emergency care of a multiple injury patient;

(f) Precautions about transport and bed care of spinal cord injury patients.

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

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

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

(1) drainage for acute osteomyelitis;

(2) sequestrectomy in chronic osteomyelitis;

(3) application of external fixation;

(4) internal fixation of fractures of long bones.

(x) DERMATOLOGY AND SEXUALLY TRANSMITTED DISEASES

An intern must be able to: -

(1) conduct proper clinical examination; elicit and interpret physical findings, and diagnose common disorders and emergencies.

(2) Perform simple, routine investigative procedures for making bedside diagnosis, specially the examination of scraping for fungus, preparation of slit smears and staining for AFB for leprosy patient and for STD cases;

(3) Take a skin biopsy for diagnostic purpose; (4) Manage common diseases recognizing the need for referral for specialized care in case of inappropriateness of

therapeutic response.

(xi) PSYCHIATRY :

An Intern must be able to:

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

(xii) TUBERCULOSIS AND RESPIRATORY DISEASES :

An intern after training must be able to: -

(1) conducting proper clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;

(2) perform simple, routine investigative procedures required for making bed side diagnosis, specially sputum collection, examination for etiological organism like AFB, interpretation of chest X-rays and respiratory function tests;

(3) Interpret and manage various blood gases and pH abnormalities in various respiratory diseases;

(4) Manage common diseases recognizing need for referral for specialized care in case of inappropriateness of therapeutic response;

(5) Perform common procedures like laryngoscopy, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage aspiration.

(xiii) ANAESTHESIA :

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

(1) perform pre-anaesthetic check up and prescribe pre-anaesthetic medications;

(2) perform venepuncture and set up intravenous drip;

(3) perform laryngoscopy and endotracheal intubation;

(4) perform lumbar puncture, spinal anaesthesia and simple nerve blocks;

(5) conduct simple general anaesthetic procedures under supervision;

- (6) monitor patients during anaesthesia and post operative period;
- (7) recognise and manage problems associated with emergency anaesthesia;
- (8) maintain anaesthetic records;
- (9) recognise and treat complication in post operative period;
- (10) perform cardio-pulmonary brain resuscitation (C.P.B.R.) 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.

(xvii) BLOOD BANK AND TRANSFUSION DEPARTMENT

During the two weeks of elective posting the intern shall learn

- (1) Blood grouping in OAB and Rh systems – typing, cross matching
- (2) Selection of blood donors; screening for diseases
- (3) Collection of blood; separation of blood components
- (4) Storage of blood and blood components – changes during storage
- (5) Transfusion of blood and blood components
- (6) Transfusion reactions – management
- (7) Infections spread by transfusion.


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**NATIONAL MEDICAL COMMISSION
UNDERGRADUATE MEDICAL EDUCATION BOARD**

22th April 2021

DRAFT REGULATIONS FOR COMPULSORY ROTATING INTERNSHIP, 2021

No. NMC_____ In exercise of the powers conferred by Section 57 of the National Medical Commission Act, 2019 (30 of 2019), the National Medical Commission through the Undergraduate Medical Education Board under the provisions of Section 24 of the National Medical Commission Act 2019 hereby makes the following regulations namely:

**CHAPTER I
PRELIMINARY**

1. GENERAL

1.1 Short title:

These regulations may be called the *Compulsory Rotating Internship Regulations, 2021*.

1.2 Commencement:

These Regulations shall come into force from the date of publication in the Official Gazette.

1.3 Jurisdiction:

These regulations shall apply to all the medical colleges/institutions/universities conducting undergraduate medical courses (hereinafter referred to as the Medical College) in accordance with the provisions of the NMC Act 2019 in India

2. DEFINITIONS

- 2.1 "Competencies" in these Regulations mean the ability to do specific tasks related to the practice of medicine well and efficiently ensuring quality.
- 2.2 "Curriculum" means a statement of the intended aims and objectives, content, assessment, experiences, outcomes and processes of an educational programme, including a description of the structure and expected methods of learning, teaching, feedback and supervision. The curriculum should set out the knowledge, skills and professional qualities the trainee is to achieve. *This is distinguished from a syllabus which is a statement of content to be taught and learnt.*
- 2.3 "Foreign Medical Graduate" or "FMG" is a person who has graduated with a Primary Medical Qualification outside India having fulfilled the applicable requirements in accordance with the *Screening Test Regulations, 2002* and the *Eligibility Requirement for taking admission in an undergraduate medical course in a Foreign Medical Institution Regulations, 2002* of the erstwhile Medical Council of India with amendments duly recognized by the NMC under Section 61(2) of the NMC Act, 2019 superseded by the *Foreign Medical Graduates Regulations 2021* of the NMC whenever this regulation comes into force and is equivalent to *International Medical Graduates* terminology used elsewhere.
- 2.4 "Indian Medical Graduate" or "IMG" is a person who has graduated with a Primary Medical Qualification in India having fulfilled the applicable requirements as recognized by the NMC in


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accordance with the “*Graduate Medical Education, 1997*” and “*Regulations on Graduate Medical Education (Amendment), 2019*” with subsequent amendments, if any, duly recognized by the National Medical Commission under Section 61(2) of the NMC Act, 2019.

- 2.5 “Intern” means a medical graduate who is undergoing a period of training, “Compulsory Rotating Internship” or “Internship” as provided in these Regulations.
- 2.6 “Log book” in these Regulations mean an official document chronicling the performance of an Intern over time and is a record of the work done, procedures performed and competencies achieved.
- 2.7 “MBBS” means the degree of Bachelor of Medicine and Bachelor of Surgery of a university or an approved institution from India in accordance with the “*Graduate Medical Education, 1997*” and “*Regulations on Graduate Medical Education (Amendment), 2019*” with subsequent amendments, if any, duly recognized by the National Medical Commission under Section 61(2) of the NMC Act.
- 2.8 “Medical institution” or “Medical college” or “Institution” or “College” in this regulation means any institution within or outside India which grants degrees, diplomas or licenses in medicine and include affiliated colleges and deemed to be Universities.
- 2.9 “Medicine” means modern scientific system of medicine or allopathy in all its branches and includes surgery and obstetrics, but does not include veterinary medicine and surgery.
- 2.10 “National Medical Commission” or “NMC”: means a Commission, known as the National Medical Commission, constituted by the Central Government to exercise the powers conferred upon, and to perform the functions assigned to it, as under Section 3 (1) of the National Medical Commission Act, 2019.
- 2.11 “NMC Act” or “Act” means the National Medical Commission Act 2019 of the Parliament that has received the assent of the President of India and duly published in The Gazette of India on 8th August 2019.
- 2.12 “Notification” means notification published in the Official Gazette and the expression “notify” shall be construed accordingly.
- 2.13 “Permanent Registration” is the registration of eligible persons with a duly recognized primary medical qualification as regulated under Chapter VI of the National Medical Commission Act 2019, that permits or provides license to the individual to independently practice modern scientific system of medicine / allopathy in India, as regulated under the Permanent Medical Regulations, 2021 of the NMC.
- 2.14 “Prescribed” means prescribed by rules made under the NMC Act, 2019 and these Regulations.
- 2.15 “Primary Medical Qualification” means a medical graduation degree such as MBBS conferred in India or an equivalent qualification of any country other than India or an erstwhile licentiate qualification of India granted, under the Indian Medical Council Act, 1956, which are in force as on the date of commencement of the NMC Act, 2019 that continues to be in force till the date of their expiry for all purposes, as if they had been issued or granted under the provisions of this Act or the rules or regulations made thereunder.
- 2.16 Provisional Registration is licence / registration for supervised practice of modern system of medicine / allopathy granted by appropriate State Medical Councils for a period limited to the period

of Compulsory Rotating Internship as applicable under the *Regulations for Compulsory Rotating Internship, 2021* to those who fulfil the necessary eligibility requirements.

- 2.17 “Recognised medical qualification” means a medical qualification recognised under Section 35 or Section 36 or Section 37 or Section 40 of the NMC Act, 2019 as the case may be.
- 2.18 “Regulations” means the regulations made by the Commission under this Regulations.
- 2.19 “Skills” or “Clinical Skills” may contain one or several different domains such as: physical examination skills, practical procedure, communication skills, and management, and consists of procedural knowledge and its performance, application of underlying basic science knowledge and clinical reasoning in the context of patient care.
- 2.20 “State Medical Council” means a medical council constituted under any law for the time being in force in any State regulating the registration of practitioners of medicine.
- 2.21 “Supervisor” or “Mentor” means an appropriately qualified and trained medical teacher, senior to the trainee, who guides the trainee’s education and/skill enhancement / research work.
- 2.22 “Undergraduate Medical Education Board” or “UGMEB”: means an autonomous board constituted under Section 16 of the National Medical Commission Act 2019.
- 2.23 “University” shall have the same meaning as assigned to it in clause (f) of section 2 of the University Grants Commission Act, 1956 and includes a Health University in India or an equivalent institution outside India that has a Medical faculty duly recognized in that country.

CHAPTER II GENERAL

3. INTERNSHIP

Internship is a phase of training wherein a medical graduate will acquire the skills and competencies for practice of medical and health care under supervision in preparation for independent, unsupervised primary care.

The learning methods and modalities have to be initiated and inculcated during the MBBS course itself with larger number of hands-on-sessions and practice on simulators preceding actual clinical training.

3.1 Goal

The goal of the internship programme is to train medical graduates to fulfill their roles as doctors of first contact in the community.

3.2 Objectives

At the end of the internship period, the medical graduate will possess all competencies required of an Indian

Medical Graduate, necessary to function as a:

- (a) Clinician who understands and independently provides safe preventive, promotive, curative, palliative and holistic care with compassion and is confident of handling common acute

emergencies.

- (b) Leader and member of the health care team and health system.
- (c) Effective communicator with patients, families, colleagues and the community.
- (d) Clinician with reliable competencies in diagnostic and therapeutic skills in different disciplines of medicine, appropriate for a primary care physician.
- (e) Lifelong learner committed to continuous improvement of skills and knowledge.
- (f) Professional who is committed to excellence and is ethical, responsive and accountable to patients, community and profession.

4. DURATION OF INTERNSHIP

4.1 Total Duration

Every candidate shall be required to undergo Compulsory Rotating internship to the satisfaction of the College authorities and University concerned after passing the final MBBS examination/ NExT whenever operational, 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) by the respective universities and Permanent Registration in accordance with the Permanent Registration Regulations 2021 of the NMC.

4.2 Period for Completion

- (a) The Internship shall be completed within 2 years of passing the Final MBBS / FMGE/ NExT Examination whenever in force.
- (b) The minimum duration of Compulsory Rotating Internship may be extended appropriately by a reasonable period on recommendation by the College/ University for reasons including but not limited to:
 - (i) Insufficient period of attendance
 - (ii) Unsatisfactory acquisition of required competence
 - (iii) Unsuccessful qualification on assessment
 - (iv) Any exigency such as disasters or unforeseen circumstances in the country as notified by the Government of India or any competent authority duly authorized to do so.
- (c) The duration of Internship may be curtailed / temporarily suspended or even withdrawn / cancelled at any time by the Institution / University according to prevailing rules/ regulations of the relevant authority provided
 - (i) The registrant due to any reason whatsoever desires not to pursue Compulsory Rotating Internship
 - (ii) The registrant is not found to have fulfilled eligibility requirements
 - (iii) There are proven acts of indiscipline
 - (iv) There are proven acts of professional misdemeanor/ misconduct
 - (v) Any other acts / actions including those violating law of the land

4.3 Time Distribution for Internship

An intern shall be posted by rotation as presented in the table below:

Sr. No.	Nature of Posting	Department / Specialty	Duration	Remarks
1	Mandatory Exclusive	Community Medicine	2 months	a. Postings should be in Community Health Centres (CHC)/ Rural Health Centre (RHC) b. Not more than 15 interns at any given time in one centre c. In the event of more than one college utilizing the same facility, at a given time interns from only one college shall be posted in the given health Centre d. As provided in the Minimum Requirements for MBBS Admissions, 2020 Section A.1.14 related to Community Medicine must be followed.
2	Mandatory Exclusive	General Medicine	1.5 months	Includes postings in Out-patient, In-patient wards & Admission Day Emergency and exposure to High Dependency Units (HDU) and Intensive Care Units (ICU)
3	Mandatory Exclusive	Psychiatry	2 weeks	Predominantly Out-patient postings with exposure to handling emergencies
4	Mandatory Exclusive	Pediatrics	1 month	Includes postings in Out-patient, In-patient wards & Admission Day Emergency postings and exposure to Neonatal/ Pediatric High Dependency and Intensive Care Units (HDU/NICU/PICU)
5	Mandatory Exclusive	General Surgery	1.5 months	Includes postings in Out-patient, In-patient wards, Admission Day Emergency and both Minor and Major Operation Theatres and exposure to High Dependency Units (HDUs) and Intensive Care Units (ICUs)
6	Mandatory Exclusive	Anesthesiology & Critical Care	2 weeks	Includes postings in Operation Theatre, Intensive Care Units and additionally Pain Clinic and Palliative Care, if available
7	Mandatory Exclusive	Obstetrics & Gynaecology including Family Welfare & Planning	1.5 months	Includes postings in Out-patient, In-patient wards, Admission Day Emergency, Labour Room and Operation Theatres and exposure to High Dependency Units (HDU) and Intensive Care Units (ICU)

8	Mandatory Exclusive & Concurrent <i>PMR with Orthopedics</i>	Orthopaedics including Physical Medicine and Rehabilitation (PM&R)	2 weeks	Includes postings in Out-patient, In-patient, Admission Day Emergency, Plaster Room and Operation Theatres Postings in Physical Medicine and Rehabilitation (PM&R) <i>may</i> run concurrent in afternoons/mornings equivalent to 4 half-days (14% of total postings)
9	Mandatory Exclusive	Emergency/ Trauma/ Casualty	2 weeks	Includes postings related to Resuscitation areas, Triage, In-patient wards and Operation Theatre as well as exposure to medico-legal procedures
10	Mandatory Exclusive	Forensic Medicine & Toxicology	1 week	Includes Autopsy postings
11	Mandatory Exclusive	Dermatology, Venereology & Leprology	1 week	Predominantly Out-patient postings with exposure to handling emergencies
12	Mandatory Concurrent	Otorhinolaryngology	2 weeks	Predominantly Out-patient postings with exposure to handling emergencies, Minor as well as Major Operation Theatres <i>Postings in Forenoon with Postings in Laboratory Sciences and Hospital Support Services in Afternoon</i>
13	Mandatory Concurrent	Ophthalmology	2 weeks	Predominantly Out-patient postings with exposure to handling emergencies, Minor as well as Major Operation Theatres <i>Postings in Forenoon with Postings in Laboratory Sciences and Hospital Support Services in Afternoon</i>
14	Mandatory Concurrent	Laboratory Sciences and Hospital Support Sciences	2 weeks	• Laboratory Medicine and Clinical Biochemistry • Histopathology & Cytopathology • Hematology, and Transfusion Medicine / Blood Bank <i>Minimum 3 half-days in each of the three above groups of specialties</i> <i>Postings in Afternoon with Postings in Otorhinolaryngology/ Ophthalmology in Forenoon</i>
			2 weeks	• Microbiology (including Virology), • Hospital Infection Control,

				Biomedical Waste Management, Central Sterile Supply Units • Medical Record Keeping • Hospital Information Services <i>Minimum 2 half-days in each of the four above groups of specialties / services</i> • Postings in Afternoon with Postings in Otorhinolaryngology/ Ophthalmology in Forenoon
15	Electives Exclusive	Broad Specialties Group	2 weeks each	At least ONE with a maximum TWO: • Tuberculosis & Respiratory Medicine • Radiodiagnosis • Nuclear Medicine • Radiotherapy • Geriatric Medicine • Physiotherapy • Other Broad Specialty recognized by NMC <i>Each posting shall be of two weeks duration</i> • It is mandatory that the chosen specialty/ discipline is available in the same College/ Institution where Internship is being done
16		Superspecialty Group	1 week each	May chose any TWO provided the chosen specialty/ discipline is available in the same College/ Institution where Internship is being done Cardiology Cardio- Thoracic Surgery Nephrology Urology Neurology. Neurosurgery Gastroenterology. Gastrointestinal Surgery Pulmonary Medicine Pediatric Surgery Medical Oncology Surgical Oncology
17	Electives Exclusive	Indian Systems of Medicine	1 week each	May chose any elective, provided the discipline is available in the same College/ Institution where

				<i>Internship is being done</i> • Ayurveda • Yoga • Unani • Siddha • Homeopathy • Sowa Rigpa

4.4 Institutions

- (a) Indian Medical Graduates shall complete their entire period of Compulsory Rotating Internship in the institution where they have pursued and completed their MBBS.
 - (i) One-year 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. The training in Community Medicine should fulfill the norms of the NMC as proposed above.
- (b) Foreign Medical Graduates who require to complete a period of Internship shall do so only in Medical Colleges/ Institutions approved for providing Compulsory Rotating Internship to Indian Medical Graduates
 - (i) Foreign Medical Graduates may be posted to different Medical Colleges/ Institutions through a counselling / seat allocation process based on the merit or by any other scheme/ method as may be notified by the National Medical Commission or any other authority as applicable
 - (ii) Medical Colleges / Institutions may admit up to 7.5 % of their permitted annual intake of MBBS seats applicable to that batch of interns to accommodate internship by Foreign Medical Graduates
- (c) The College / Institution and its affiliated hospitals and Community Health Centres shall be recognized by the National Medical Commission for the conduct of MBBS Course for that batch and also for conducting the Compulsory Rotating Internship programme.

5. ELIGIBILITY

Following requirements need to be fulfilled to be eligible for Compulsory Rotating Internship

5.1 Indian Medical Graduates

- (a) The applicant should have successfully completed the MBBS Course of any university from a college/ institution approved and recognized by the National Medical Commission and listed by the Undergraduate Medical Education Board under the provisions of Section 35 of the NMC Act, 2019
- (b) The qualifying examination for Indian Medical Graduates shall be in accordance with the applicable rules and regulations of the National Medical Commission at the time of commencement of internship
 - (i) The Final MBBS Examination of various universities / institutions of India

- (ii) The National Exit Test (NExT) held under Section 15 (1) of the NMC Act 2019 whenever this examination becomes operational
- (iii) Any other requirement as may be regulated / notified by the Government of India / National Medical Commission

5.2 Foreign Medical Graduates

- (a) Foreign Medical Graduates as regulated by the Foreign Medical Graduate Regulations 2021 of the NMC, whenever this comes into force are required to undergo Internship at par with Indian Medical Graduates *if they desire or seek Permanent Registration to practice Medicine in India.*
 - (i) All Foreign Medical Graduates, unless otherwise notified shall be required to undergo Compulsory Rotating Internship at par with Indian Medical Graduates after the National Exit Test (NExT) becomes operational.
- (b) Indian citizens (including overseas Indian citizens) who are Foreign Medical Graduates who do not fall under the purview of the Foreign Medical Graduate Regulations 2021 shall be regulated by the provisions of Section 13(3) of the Indian Medical Council Act, 1956 in accordance with the Advisory no MCI-203(1)(Gen)/2020-Regn./118239 dated 02/09/2020 and shall be required to complete Compulsory Rotating Internship in India if they have not undergone such practical training after obtaining such qualification as may be required by the rules and regulations in force in the country granting such qualification or has not undergone any practical training in that country.

5.3 Provisional Registration in a State Medical Council

It shall be mandatory to obtain Provisional Registration in a State Medical Council or any other body authorized for such registration *prior* to internship *provided*

- (a) The Registration shall be valid only for Compulsory Rotating Internship by the applicant provided the applicable rules / regulations of the registering authority are fulfilled
- (b) The Provisional Registration shall normally be valid for a period of ONE YEAR and shall stand cancelled/ withdrawn/ invalid after this period unless otherwise extended
- (c) The Provisional Registration shall be applicable only in the College/ Institution where the intern is registering for Compulsory Rotating Internship
- (d) The intern shall not be permitted for independent practice during the period of Compulsory Rotating Internship.
- (e) The intern shall *not*:
 - (i) issue any medical certificates
 - (ii) independently perform medicolegal procedures such as autopsy, or complete such records without supervision
 - (iii) perform independent surgical/interventional procedures without supervision
 - (iv) hold a teaching position in a medical college / institution
 - (v) indulge in any form of medical practice, clinical or otherwise outside the purview of the requirements of Compulsory Rotating Internship
 - (vi) do any other act as may be restricted / forbidden by the rules and regulations of the institution

university as applicable

6. ADMINISTRATION

6.1. Authority

The Dean/ Principal/ Director or any other equivalent authority shall be responsible for implementation of these Regulations.

6.2. Leave

(a) Normal Leave

- (i) Interns shall be permitted a maximum of 15 days leave with prior permission, during the entire period of internship
- (ii) The entire period of 15 days cannot be availed during any of the one week / two-week postings applicable to a single department / specialty as indicated under Section 4.3(a)

(b) Maternity Leave

- (i) Lady Interns may be permitted Maternity Leave according to prevailing rules and regulations of the Central / State Government as may be applicable

(c) Medical Leave

- (i) Medical Leave shall be included within the 15 days of Normal leave
 - (ii) Any Medical Leave beyond this period shall be recommended only by a duly constituted Medical Board
- (d) The internship shall be extended if the leave of absence of any kind exceeds beyond this period
- (i) The period of extension shall be equivalent to the period beyond permissible 15 days of leave
 - (ii) The internship shall be repeated only in the department / specialty wherein the above extension is necessary

6.3. Stipend

All interns shall be paid stipend as fixed by the appropriate fee fixation authority applicable to the institution/ university/ state.

- (i) Stipend may not be paid during any period of extension except in the case of Maternity Leave or Medical Leave as may be recommended and approved by the Medical Board. Total stipend paid for the entire internship may be for 48 weeks (12 months) only.

7. TRAINING

7.1. Internship training shall be supervised

- (a) The intern shall be entrusted with clinical responsibilities under direct supervision of a designated supervising physician / mentor in each department / supervisor who shall be a Faculty member

- (b) The supervisor shall be responsible for any ethical and legal issues related to interns being supervised by them
 - (c) The restrictions of independent practice related to patient care and other services during internship are as in Section 5.3(e)
- 7.2 Interns shall be given adequate opportunities to acquire competencies to become confident primary care physicians
- (a) The emphasis during internship shall be hands-on training applying the scientific and theoretical background gained during the undergraduate course
 - (b) Based on the progress of knowledge, skill acquisition, graded responsibility for patient care should be given
 - (b) Interns shall be trained to independently handle common acute emergencies and be aware of individual limitations and necessity of proper and timely referral of such cases to appropriate centres
- 7.3 Interns shall be mentored to acquire effective communication and other skills that are necessary for empathetic and compassionate clinical care
- 7.4 Each medical college must ensure that the intern gets learning experience in the community
- (a) These shall include community and outreach activities, collaboration with rural and urban community health centers, participation in government health programmes etc.
 - (b) 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.
 - (c) 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.
 - (d) 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.
- 7.5 The Training Programs shall be implemented as per the guidelines elaborated in Chapter III

8. ASSESSMENT

- 8.1 The intern shall maintain a record of work in a log book, which is to be verified and certified by the medical officer under whom he/she works.
- 8.2. 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.
- (a) The assessments shall predominantly test clinical/ practical skills.

- (b) Feed-back mechanisms must be in place so that progress and deficiencies are conveyed to interns such that measures for correction and improvement can be instituted early and effectively.
- (c) Based on the record of work and objective assessment at the end of each posting, the respective Head of the Unit and Head of the Department shall certify satisfactory completion of the posting.
- (d) The Dean/Principal shall issue cumulative certificate of satisfactory completion of training at the end of internship.
- (e) Interns shall have to undergo an eligibility licentiate test whenever duly notified as a requisite to granting of Permanent Registration/ license to practice.

CHAPTER III

GUIDELINES FOR THE IMPLEMENTATION OF THE TRAINING PROGRAMME

1. DISCIPLINE

(i) Community Medicine

1. **Goal:-**The aim of teaching the undergraduate student in Community Medicine is to impart such knowledge and skills that may enable him to diagnose and treat common medical illnesses and recognize the importance of community involvement. He/she shall acquire competence 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: -

2.1 District Hospital /Community Health Centre:

A. An intern must be able to do without assistance:

1. An intern must:

- a) Be able to diagnose common ailments and advise primary care;
- b) Demonstrate knowledge on 'Essential drugs' and their usage;
- c) Recognize medical emergencies, resuscitate and institute initial treatment and refer to a suitable institution/ suggest to the patient an alternative health care facility if he/she wants to know about the same.

2. An intern must be familiar with all National Health Programmes (e.g. RCH, UIP, CDD, ARI, FP, ANC, Tuberculosis, Leprosy and others), as recommended by the Ministry of Health and Family Welfare.

3. An intern must:

- a) Gain full expertise in immunization against infectious disease;
- b) Participate in programmes related to prevention and control of locally prevalent endemic diseases including nutritional disorders;
- c) Learn skills in family welfare planning procedures;

4. An intern must:

- a) Conduct programmes on health education,
- b) Gain capabilities to use Audio visual aids,
- c) Acquire capability of utilization of scientific information for promotion of community health

B. An intern must have observed or preferably assisted at the following:

- 1. An intern should be capable of establishing linkages with other agencies as water supply, food distribution and other environmental/social agencies.
- 2. An intern should acquire managerial skills including delegation of duties to and monitoring the activities of paramedical staff and other health care professionals.

2.2 Taluka Hospital/ First Referral Unit/ CHC

A. An intern must be able to do without assistance:

1. An intern shall 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.

B. An intern must be able to do with supervision:

- 1. An intern shall attend at least one school health programme with the medical officer.

2.3 Primary Health Centre / Urban Health Centre

A. An intern must be able to do without assistance the following:

- a) Participate in family composite health care (birth to death), inventory of events.
- b) Participate in use of the modules on field practice for community health e.g. safe motherhood, nutrition surveillance and rehabilitation, diarrheal disorders etc.
- c) Participate in and maintain documents related to immunization and cold chain.
- d) Acquire competence in diagnosis and management of common ailments e.g. malaria, tuberculosis, enteric fever, congestive heart failure, hepatitis, meningitis acute renal failure etc.

B. An intern must be able to do under supervision the following:

- a) Acquire proficiency in Family Welfare Programmes (antenatal care, normal delivery, contraception etc.).

- b) Undergo village attachment of atleast one week duration to understand issues of community health along with exposure to village health centres, ASHA Sub-Centres.
- c) Participate in Infectious Diseases Surveillance and Epidemic Management activities along with the medical officer.

ii. General Medicine

1. Goal:-The aim of posting of an intern in General Medicine is to impart such knowledge and skills that may enable him to diagnose and treat common medical illnesses. He/she shall acquire competence in clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management; this would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and various system illnesses.

2.1 An intern must be able to PERFORM without assistance and interpret the results of the following investigations:

- a) Blood: (Routine haematology smear and blood groups),
- b) Urine: (Routine chemical and microscopic examination),
- c) Stool: (for ova/cyst and occult blood),
- d) Sputum and throat swab for gram stain or acid-fast stain,
- e) Cerebrospinal Fluid (CSF) for proteins, sugar and smear,
- f) Electrocardiogram (ECG),
- g) Glucometer recording of blood sugar,
- h) Routine radiographs of chest, abdomen, skull etc.

2.2 An intern must perform independently the following diagnostic procedures:

- (a) Proctoscopy, Ophthalmoscopy/ Otoscopy, Indirect laryngoscopy.
- (b) Therapeutic procedures;
- (c) Urethral catheterization, Insertion of Ryle's Tube, Pleural, Ascitic fluid aspiration,
- (d) Cerebrospinal Fluid (CSF) aspiration, Air way tube installation,
- (e) Oxygen administration etc.

2.3 An intern must have observed or preferably assisted at the following operations/procedures:

- a) **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 under supervision.

(b) Skills that an intern should be able to perform under supervision:

- (i) should be familiar with life-saving procedures, including use of aspirator, respirator and defibrillator, cardiac monitor, blood gas analyser.
- (ii) should be able to advise about management and prognosis of acute & chronic illnesses like viral fever, gastroenteritis, hepatitis, pneumonias, myocardial infarction and angina, TIA and stroke, seizures, diabetes mellitus, hypertension renal and hepatic failure, thyroid disorders and hematological disorders. He should participate in counseling sessions for patients with non-communicable diseases and tuberculosis, HIV patients etc.
- (iii) should be able to confirm death and demonstrate understanding of World Health Organization cause of death reporting and data quality requirements.
- (iv) should be able to demonstrate understanding of the coordination with local and national epidemic management plans.
- (v) should be able to demonstrate prescribing skills and demonstrate awareness of pharmaco-vigilance, antibiotics policy, prescription audit and concept of essential medicines list.

Psychiatry

1. Goal:- The aim of posting of an intern in Psychiatry is to impart such knowledge and skills that may enable him/her to diagnose and treat common psychiatric illnesses. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management. He/she should also be able to recognize the behavioral manifestations of systemic illnesses and differentiate them from psychiatric disorders.

2. Therapeutic-

A. An intern must perform or assist in:

- (i) Diagnose and manage common psychiatric disorders,
- (ii) Identify and manage psychological reactions,
- (iii) Diagnose and manage behavioral disorders in medical and surgical patients.

B. An intern must have observed or preferably assisted at the following operations/procedures:

- (i) ECT administration,
- (ii) Therapeutic counseling and follow-up.

iii. Pediatrics

1. Goal:

The aim of posting of an intern in Pediatrics is to impart such knowledge and skills that may enable him/her to diagnose and treat common childhood illnesses including neonatal disorders. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management. This would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and various system illnesses.

2.1 An intern must be able to do without assistance:

- (i) An intern shall be able to diagnose and manage common childhood disorders including neonatal disorders and acute emergencies, examining sick child making a record of information.

2.2. An intern shall perform:

- (i) **Diagnostic techniques:** blood collection (including from femoral vein and umbilical cord), drainage of abscess, collection of cerebrospinal, pleural and peritoneal fluids, suprapubic aspiration of urine.
- (ii) **Techniques related to patient care:** immunization, perfusion techniques, nasogastric tube insertion, feeding procedures, tuberculin testing & breast-feeding counseling.
- (iii) **Use of equipments:** vital monitoring, temperature monitoring, resuscitation at birth and care of children receiving intensive care.
- (iv) Institute early management of common childhood disorders with special reference to pediatric dosage and oral rehydration therapy.

2.3 An intern must have observed or preferably assisted at the following operations/procedures:

- (i) Screening of newborn babies and those with risk factors for any anomalies and steps for prevention in future; detect congenital abnormalities;
- (ii) Recognise growth abnormalities; recognise anomalies of psychomotor development;
- (iii) Assess nutritional and dietary status of infants and children and organize prevention, detection and follow-up of deficiency disorders both at individual and at community levels, such as:
 - protein-energy malnutrition
 - deficiencies of vitamins especially A, B, C and D;
 - Iron deficiency

2.4. Skills that an intern should be able to perform under supervision:

- (i) An intern should be familiar with life-saving procedures, including use of aspirator, respirator, cardiac monitor, blood gas analyser.
- (ii) An intern should be able to advise about management and prognosis of acute & chronic illnesses like viral fever, gastroenteritis, hepatitis, pneumonias, congenital heart diseases, seizures, renal and hepatic diseases, thyroid disorders and hematological disorders. She/he should participate in counseling sessions with parents including HIV counseling.

iv. General Surgery

1. Goal-The aim of posting of an intern in General Surgery is to impart such knowledge and skills that may enable him to diagnose and treat common surgical ailments. He/she shall have ability to diagnose and suspect with reasonable accuracy all acute and chronic surgical illnesses.

2. Therapeutic-

A. An intern must perform or assist in:

- (i) venesection or venous access
- (ii) tracheostomy and endotracheal intubation
- (iii) catheterization of patients with acute retention or trocar cystostomy
- (iv) drainage of superficial abscesses
- (v) basic suturing of wound and wound management (including bandaging)
- (vi) biopsy of surface tumours
- (vii) perform vasectomy

B. Skills that an intern should be able to perform under supervision:

- (i) Advise about prognosis of acute and chronic surgical illnesses, head injury, trauma, burns and cancer. Counsel patients regarding the same.
- (ii) Advise about rehabilitation of patients after surgery and assist them for early recovery.
- (iii) Should be able to demonstrate understanding of World Health Organisation cause of death reporting and data quality requirements.
- (iv) Should be able to demonstrate understanding of the use of national and state/ local cause of death statistics.

C. An intern must have observed or preferably assisted at the following operations/procedures:

- (i) Resuscitation of critical patients
- (ii) Basic surgical procedures for major and minor surgical illnesses
- (iv) Wound dressings and application of splints
- (v) Laparoscopic/ Minimally Invasive surgery
- (vi) Lymph node biopsy

v. Anesthesiology

1. Goal:- The aim of posting of an intern in anaesthesia is to impart such knowledge and skills that may enable him to understand principles of anaesthesia and recognize risk and complications of anaesthesia. At the end of internship, he/she should be able to perform cardio-pulmonary resuscitation correctly, including recognition of cardiac arrest.

2. THERAPEUTIC-

A. An intern must perform or assist in:

- (i) Pre-anaesthetic checkup and prescribe pre-anaesthetic medications,
- (ii) Venepuncture and set up intravenous drip,
- (iii) Laryngoscopy and endotracheal intubation,
- (iv) Lumbar puncture, spinal anaesthesia and simple nerve blocks,
- (v) Simple general anaesthetic procedures under supervision,
- (vi) Monitor patients during anaesthesia and in the post-operative period,
- (vii) Maintain anaesthetic records,
- (viii) Perform cardio-pulmonary resuscitation correctly, including recognition of cardiac arrest.

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

- (i) Counseling and advise regarding various methods of anaesthesia,
- (ii) Recognise and manage problems associated with emergency anaesthesia,
- (iii) Recognise and assist in treating complications in the post-operative period.

C. An intern must have observed or preferably assisted at the following operations/ procedures

- (i) Anaesthesia for major and minor surgical and other procedures;

vi. Obstetrics and Gynaecology

1. **Goal**-The aim of posting of an intern in Obstetrics & Gynaecology is to impart such knowledge and skills that may enable him/ her to diagnose and manage antenatal and post natal follow up; manage labor and detect intra-partum emergencies; diagnose and treat common gynaecologic ailments.

2. THERAPEUTIC-

A. An intern must perform or assist in:

- (i) Diagnosis of early pregnancy and provision of ante-natal care; antenatal pelvic assessment and detection of cephalo-pelvic disproportion,
- (ii) Diagnosis of pathology of pregnancy related to:
 - abortion
 - ectopic pregnancy
 - tumours complicating pregnancy
 - acute abdomen in early pregnancy
 - hyperemesis gravidarum,
- (iii) Detection of high risk pregnancy cases and give suitable advice e.g. PIH, hydramanios, antepartum haemorrhage, multiple pregnancies, abnormal presentations and intra-uterine growth retardation,
- (iv) Induction of labor and amniotomy under supervision, Management of normal labor, detection of abnormalities, post-partum hemorrhage and repair of perennial tears,
- (v) Assist in forceps delivery,
- (vi) Detection and management of abnormalities of lactation,
- (vii) Evaluation and prescription oral contraceptives with counseling,
- (viii) Per speculum, per vaginum and per rectal examination for detection of common congenital, inflammatory, neoplastic and traumatic conditions of vulva, vagina, uterus and ovaries,
- (ix) Medico-legal examination in Gynecology and Obstetrics.

B. Skills that an intern should be able to perform under supervision:

- (i) Dilatation and curettage and fractional curettage,
- (ii) Endometrial biopsy,
- (iii) Endometrial aspiration,
- (iv) Pap smear collection,
- (v) Intra Uterine Contraceptive Device (IUCD) insertion,
- (vi) Mini-lap-ligation,
- (vii) Urethral catheterization,
- (viii) Suture removal in post-operative cases,
- (ix) Cervical punch biopsy.

C. An intern must have observed or preferably assisted at the following operations/procedures:

- (i) Major abdominal and vaginal surgery cases,

- (ii) Second trimester Medical Termination of Pregnancy (MTP) procedures e.g. Emcredyl Prostaglandin instillations, Caesarean section.

vii. Orthopaedics

1. Goal:- The aim of posting of an intern in Orthopaedics and Physical Medicine and Rehabilitation is to impart such knowledge and skills that may enable him to diagnose and treat common ailments. He/she shall have ability to diagnose and suspect presence of fracture, dislocation, actual osteomyelitis, acute poliomyelitis and common congenital deformities such as congenital talipes equinovarus (CTEV) and dislocation of hip (CDH).

2. THERAPEUTIC-

A. An intern must assist in:

- (i) Splinting (plaster slab) for the purpose of emergency splintage, definitive splintage and post-operative splintage and application of Thomas splint,
- (ii) Manual reduction of common fractures – phalangeal, metacarpal, metatarsal and Colles' fracture,
- (iii) Manual reduction of common dislocations – interphalangeal, metacarpo-phalangeal, elbow and shoulder dislocations,
- (iv) Plaster cast application for un-displaced fractures of arm, fore arm, leg and ankle,
- (v) Emergency care of a multiple injury patient,
- (vi) Transport and bed care of spinal cord injury patients.

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

- (i) Advise about prognosis of poliomyelitis, cerebral palsy, CTEV and CDH,
- (ii) 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:

- (i) Drainage for acute osteomyelitis,
- (ii) Sequestrectomy in chronic osteomyelitis,
- (iii) Application of external fixation,
- (iv) Internal fixation of fractures of long bones.

vii. Physical Medicine And Rehabilitation

1.Goal:-The aim of posting of an intern in Physical Medicine & Rehabilitation is to impart such knowledge and skills that may enable him/ her to diagnose and treat common rheumatologic, orthopedic and neurologic illnesses requiring physical treatment. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management.

2. THERAPEUTIC-

A. An intern must perform or assist in:-

- (i) Diagnosing and managing with competence clinical diagnosis and management based on detailed history and assessment of common disabling conditions like poliomyelitis, cerebral palsy, hemiplegia, paraplegia, amputations etc.
- (ii) Participation as a team member in total rehabilitation including appropriate follow up of common disabling conditions,
- (iii) Procedures of fabrication and repair of artificial limbs and appliances.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- (i) Use of self-help devices and splints and mobility aids
- (ii) Accessibility problems and home-making for disabled
- (iii) Simple exercise therapy in common conditions like prevention of deformity in polio, stump exercise in an amputee etc.
- (iv) Therapeutic counselling and follow-up

viii. Otorhinolaryngology (ENT)-

1. Goal:- The aim of posting of an intern in ENT is to impart such knowledge and skills that may enable him to diagnose and treat common otorhinolaryngological conditions such as ear pain, foreign bodies and acquire ability for a comprehensive diagnosis of common Ear, Nose and Throat (ENT) diseases including emergencies and malignant neoplasms of the head and neck.

2. THERAPEUTIC

A. An intern must perform or assist in:

- (i) Ear syringing, antrum puncture and packing of the nose for epistaxis,
- (ii) Nasal douching and packing of the external canal,
- (iii) Removing foreign bodies from nose and ear,
- (iv) Observing or assisting in various endoscopic procedures and tracheostomy.

B. Skill that an intern should be able to perform under supervision-

- (i) Intern shall have participated as a team member in the diagnosis of various ENT- related diseases and

be aware of National programme on prevention of deafness,

(ii) Intern shall acquire knowledge of various ENT related rehabilitative programmes.

C. An intern must have observed or preferably assisted at the following operations/ procedures:

(i) Intern 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.

ix. Ophthalmology

1.Goal:- The aim of posting of an intern in ophthalmology is to impart such knowledge and skills that may enable him to diagnose and treat 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. THERAPEUTIC-

A. An intern must perform or assist in:

- (i) Sub-conjunctival injection
- (ii) Ocular bandaging
- (iii) Removal of concretions
- (iv) Epilation and electrolysis
- (v) Corneal foreign body removal
- (vi) Cauterization of corneal ulcers
- (vii) Chalazion removal
- (viii) Entropion correction
- (ix) Suturing conjunctival tears
- (x) Lids repair
- (xi) Glaucoma surgery (assisted)
- (xii) Enucleation of eye in cadaver.

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

(i) Advise regarding methods for rehabilitation of the blind.

C. An intern must have observed or preferably assisted at the following operations/procedures:

(i) Assessment of refractive errors and advise its correction,

- (ii) Diagnose ocular changes in common systemic disorders,
- (iii) Perform investigative procedures such as tonometry, syringing,
- (iv) direct ophthalmoscopy, subjective refraction and fluorescein staining of cornea.

(x) Forensic Medicine and Toxicology

1.Goal:- The aim of posting of an intern in Forensic Medicine and Toxicology is to impart such knowledge and skills that may enable him to identify and

2. An intern must perform or assist in:

- (i) Documentation and certification of trauma
- (ii) Diagnosis and certification of death
- (iii) Legal documentation related to emergency cases
- (iv) Certification of medical-legal cases e.g. Age estimation, sexual assault etc.
- (v) Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc

B. An intern must have observed a medico-legal autopsy/ post-mortem.

(xi) Lab services consisting of Clinical Pathology, Laboratory Medicine, Biochemistry and Hematology services along with Blood Banking

An intern must be able to PERFORM without assistance and interpret the results of the following laboratory investigations:

- Blood: Complete blood count including Platelet count, peripheral blood smear preparation and examination including malarial parasites
- Urine: (Routine chemical and microscopic examination)
- Stool: (for ova/cyst and occult blood)
- Blood Banking: Blood grouping (manual), saline cross-matching
- Sputum and throat swab for Gram stain and acid-fast stain,
- Cerebrospinal Fluid (CSF) for proteins and smear,
- Performing blood sugar test by glucometer,
- Pleural and ascitic fluid for routine chemistry and microscopy
- Draw blood by venepuncture independently and collect samples in appropriate bottles in proper order
- Correctly collect and transport samples and specimens for blood tests, culture, histopathology and cytopathology investigations
- Fill requisition forms appropriately

xii. Casualty services/ Emergency Medicine

1. Goal:-The aim of posting of an intern in casualty is to impart such knowledge and skills that may enable him/her to diagnose and treat common acute surgical /medical ailments. He/she shall have ability to diagnose and suspect, with reasonable accuracy, acute surgical illnesses including emergencies, resuscitate critically injured patient and a severely burned patient, control surface bleeding and manage open wounds and monitor and institute first-line management of patients of head, spine, chest, abdominal and pelvic injury as well as acute abdomen.

2. THERAPEUTIC-

A. An intern must perform or assist in:

- (i) Identification of acute emergencies in various disciplines of medical practice,
- (ii) Management of acute anaphylactic shock,
- (iii) Management of peripheral-vascular failure and shock,
- (iv) Management of acute pulmonary edema and Left Ventricular Failure (LVF),
- (v) Emergency management of drowning, poisoning and seizure,
- (vi) Emergency management of bronchial asthma and status asthmaticus,
- (vii) Emergency management of hyperpyrexia,
- (viii) Emergency management of comatose patients regarding airways, positioning, prevention of aspiration and injuries,
- (ix) Assessment and administering emergency management of burns,
- (x) Assessing and implementing emergency management of various trauma victims,
- (xi) Identification of medico-legal cases and learn filling up of forms as well as complete other medico-legal formalities in cases of injury, poisoning, sexual offenses, intoxication and other unnatural conditions.

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

- (i) Advise about prognosis of acute surgical illnesses, head injury, trauma and burns. Counsel patients regarding the same.

C. An intern must have observed or preferably assisted at the following operations/ procedures:

- (i) Resuscitation of critical patients
- (ii) documentation medico legal cases
- (iii) management of bleeding and application of splints;

xi. Dermatology, Venereology & Leprosy

Goal:-The aim of posting of an intern in Dermatology, Venereology & Leprosy is to impart such

knowledge and skills that may enable him to diagnose and treat common dermatological infections and leprosy. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management; this would include diseases common in tropics (parasitic, bacterial or viral infections, and cutaneous manifestations of systemic illnesses).

2. THERAPEUTIC-

A. At the end of internship an intern must be able to:

- (i) Conduct proper clinical examination; elicit and interpret physical findings, and diagnose common disorders and emergencies,
- (ii) 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,
- (iii) Manage common diseases recognizing the need for referral for specialized care in case of inappropriateness of therapeutic response.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- (i) Skin biopsy for diagnostic purpose

xii. Respiratory Medicine-

Goal:-The aim of posting of an intern in Respiratory Medicine is to impart such knowledge and skills that may enable him/her to diagnose and treat common respiratory illnesses. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management.

2. THERAPEUTIC –

A. An intern must perform or assist in:

- (i) Diagnosing and managing common respiratory disorders and emergencies,
- (ii) Simple, routine investigative procedures required for making bed side diagnosis, especially sputum collection, examination for etiological organism like AFB, interpretation of chest X-rays and respiratory function tests,

(iii) Interpreting and managing various blood gases and pH abnormalities in various illnesses.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

(i) Laryngoscopy,

(ii) Pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage aspiration,

(iv) Therapeutic counseling and follow up.

xiii. Radio-Diagnosis

1. Goal:-The aim of posting of an intern in radio-diagnosis is to impart such knowledge and skills that may enable him/ her to understand principles of imageology and recognize risk and complications of radiologic procedures and the need for protective techniques. At the end of internship, he/she should be able to counsel and prepare patients for various radiologic procedures.

A. An intern must acquire competency in:

(i) Identifying and diagnosing acute abdominal conditions clinically and choose appropriate imaging modality for diagnosis,

(ii) Identifying and diagnosing acute traumatic conditions in bones and skull using X rays / CT Scans with emphasis on fractures and head injuries,

(iii) Recognising basic hazards and precautions in radio-diagnostic practices specially related to pregnancy,

(iv) Demonstrating awareness of the various laws like PC PNDT Act.

xiv. Forensic Medicine And Toxicology

1. Goal:- The aim of posting of an intern in Forensic Medicine is to impart such knowledge and skills that may enable him to manage common medico-legal problems in day to day practice. He/she shall acquire competence for post-mortem diagnosis based on history, physical examination and relevant observations during autopsy.

A. An intern must perform or assist in:

- (i) Identifying and documenting medico-legal problems in a hospital and general practice,
- (ii) Identifying the medico-legal responsibilities of a medical man in various hospital situations,
- (iii) Diagnosing and managing with competence basic poisoning conditions in the community,
- (iv) Diagnosing and managing with competence and documentation in cases of sexual assault,
- (v) Preparing medico-legal reports in various medico-legal situations.

A. An intern must have observed or preferably assisted at the following operations/ procedures:

- (i) Various medico legal / post-mortem procedures and formalities during their performance by police.

ANNEXURE 1 Certifiable Procedural Skills

A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate that should be included in log books

Specialty	Procedure
General Medicine	• Venipuncture (I) • Intramuscular injection (I) • Intradermal injection (D) • Subcutaneous injection (I) • Intra Venous (IV) injection(I) • Setting up IV infusion and calculating drip rate (I) • Blood transfusion (O) • Urinary catheterization (D) • Basic life support (D) • Oxygen therapy (I) • Aerosol therapy / nebulization (I) • Ryle's tube insertion (D) • Lumbar puncture (O) • Pleural and ascitic aspiration (O) • Cardiac resuscitation (D) • Peripheral blood smear interpretation (I) • Bedside urine analysis (D)
General Surgery	• Basic suturing (I) • Basic wound care (I) • Basic bandaging(I) • Incision and drainage of superficial abscess(I) • Early management of trauma (I) and trauma life support(D)
Orthopedics	• Application of basic splints and slings(I) • Basic fracture and dislocation management (O) • Compression bandage (I)

Obstetrics	• Obstetric examination(I) • Episiotomy(I) • Normal labor and delivery (including partogram) (I)
Gynecology	• Per Speculum (PS) and Per Vaginal (PV) examination(I) • Visual Inspection of Cervix with Acetic Acid (VIA) (O) • Pap Smear sample collection & interpretation (I) • Intra- Uterine Contraceptive Device (IUCD) insertion & removal(I)
Pediatrics	• Neonatal resuscitation(D) • Setting up Pediatric IV infusion and calculating drip rate (I) • Setting up Pediatric Intraosseous line (O)
Forensic Medicine	• Documentation and certification of trauma (I) • Diagnosis and certification of death(D) • Legal documentation related to emergency cases (D) • Certification of medical-legal cases e.g. Age estimation, sexual assault etc.(D) • Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc (D)

Otorhinolaryngology	• Anterior nasal packing (D) • Otoscopy (I)
Ophthalmology	• Visual acuity testing (I) • Digital tonometry(D) • Indirect ophthalmoscopy (O) • Epilation (O) • Eye irrigation(I) • Instillation of eye medication (I) • Ocular bandaging(I)
Dermatology	• Slit skin smear for leprosy(O) • Skin biopsy(O) • Gram's stained smear interpretation (I) • KOH examination of scrapings for fungus (D) • Dark ground illumination (O) • Tissue smear (O) • Cautery - Chemical and electrical (O)
Pathology and Blood Banking	• Peripheral blood smear preparation, staining and interpretation (I) • Urine routine and microscopy examination (I) • Manual blood sugar estimation (I) • CSF examination (I) • Blood grouping (I) • Saline cross match method (I)
Microbiology	• Gram's stained smear interpretation (I) • KOH examination of scrapings for fungus (I) • Dark ground illumination (O) • ZN stained smear interpretation (I) • Wet mount examination of stool for ova and cysts (I) • Identification of blood parasites on PBS (I)
Pharmacology	• Writing a prescription (D) • Audit of a given prescription (D) • Recognize an adverse drug reaction (I) • Be able to prepare a list of essential drugs for a healthcare facility
Applied Anatomy	• Identification of structures on X-rays/ ultrasound
Applied Physiology	• Perform, analyze, and interpret pulmonary function (eg FVC, MVV) (O) • Perform, analyze, and interpret measurements of cardiac and vascular function (eg HR, BP, ECG) (D) • Interpret blood parameters (eg hematocrit/red blood cell count, lactate, glucose) (I) • Perform, analyze, and interpret CNS function (eg nerve conduction velocity, EMG, cranial nerve examination) (D)

shift patients									
Prepare for emergency surgery / procedures									
Monitor patients requiring oxygen									
Appropriately use mask, Non invasive ventilation									
Monitor sick patients in HDU									

Note:

- These are only incomplete sample skills
- Every institution can prepare such lists for each posting and include communication skills etc.
- Instead of numbers check boxes can be used for simplicity and to avoid cumbersome entries

Annexure #: SAMPLE INTERNSHIP ASSESSMENT AND FEED-BACK FORM

Name: _____ Student / Intern ID: _____

Supervisor: _____ Department/ Specialty: _____

Unit: _____ Dates: ____ / ____ / ____ to ____ / ____ / ____ Leaves: _____ days

RATING

PLEASE RATE ON A SCALE OF 1 TO 10 WITH
1 BEING EXCEPTIONALLY POOR AND 10 BEING EXCEPTIONALLY OUTSTANDING
[Actual marks may be given instead of a score based on the assessment]

Knowledge		1	2	3	4	5	6	7	8	9	10
Patient Care		1	2	3	4	5	6	7	8	9	10
Procedural Skills	1	2	3	4	5	6	7	8	9	10	
independent care	1	2	3	4	5	6	7	8	9	10	
Communication Skills	1	2	3	4	5	6	7	8	9	10	
System Based Practice		1	2	3	4	5	6	7	8	9	10
Professionalism	1	2	3	4	5	6	7	8	9	10	
Life-long Learning		1	2	3	4	5	6	7	8	9	10

FEED-BACK

Strengths:

Areas of Improvement needed:

Comments:

Student: _____

Date: _____

Faculty: _____

Date: _____

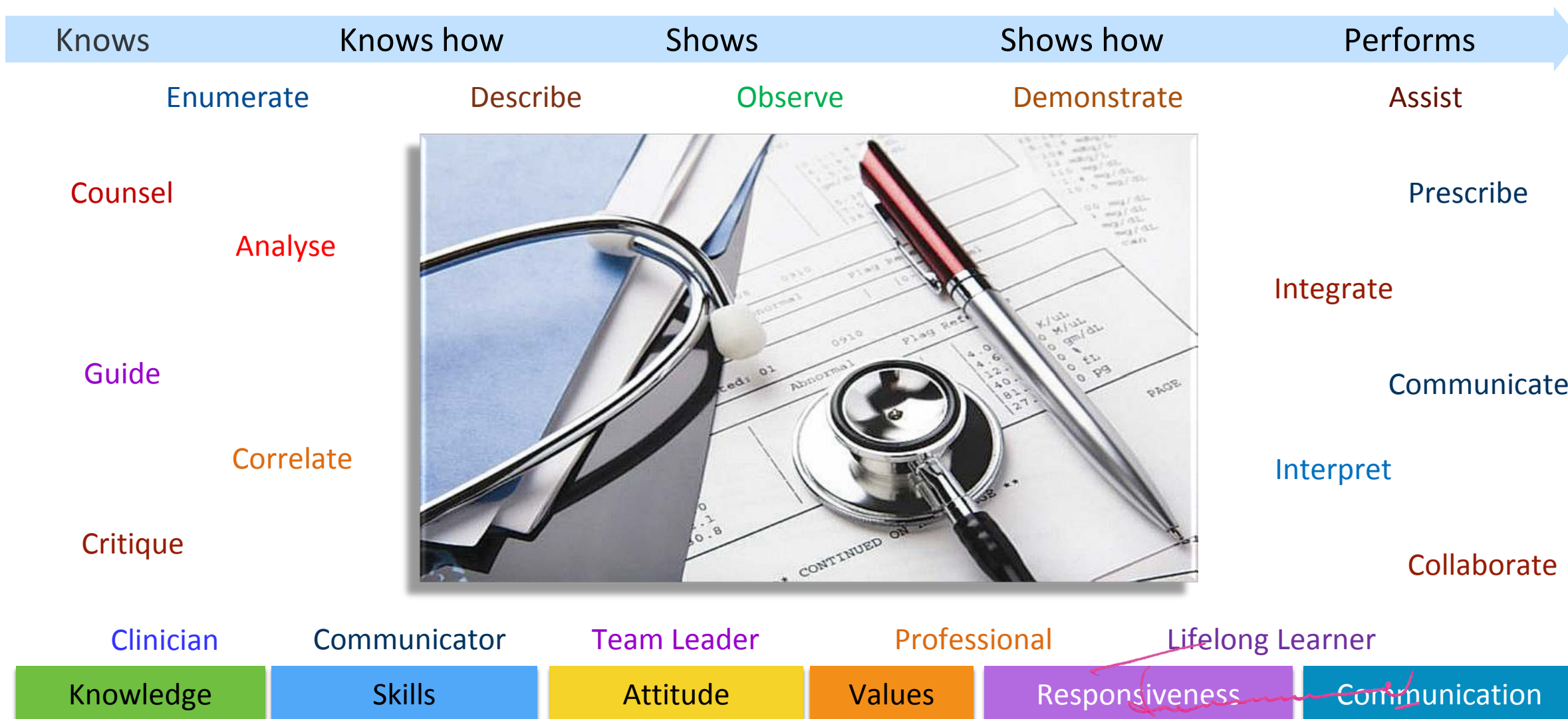
Ahanika
President (UGMEB)
07/07/2021

[Signature]
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TAGORE MEDICAL COLLEGE & HOSPITAL
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MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE



VOLUME-I (2018)

DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
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**COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE
INDIAN MEDICAL GRADUATE
2018**



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भारतीय आयुर्विज्ञान परिषद के अधिक्रमण में शासी बोर्ड

BOARD OF GOVERNORS IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

FOREWORD

The Medical Council of India, aware of its responsibilities in creation of trained health manpower, has been engaged for the past few years in updating the medical curriculum for undergraduates and postgraduates to be in consonance with the changing health needs of the country. The task of updating and reorganization of the postgraduate curriculum in nearly 50 broad specialty disciplines to the competency pattern was accomplished by the Academic Cell of the Council with the help of subject experts and members of its Reconciliation Board and have been uploaded on the Council Website for use of the medical fraternity.

The Council visualized that the Indian Medical Graduate, at the end of the undergraduate training program, should be able to recognize "health for all" as a national goal and should be able to fulfill his/her societal obligations towards the realization of this goal. To fulfill the mandate of the undergraduate medical curriculum which is to produce a clinician, who understands and is able to provide preventive, promotive, curative, palliative and holistic care to his patients, the curriculum must enunciate clearly the competencies the student must be imparted and must have learnt, with clearly defined teaching-learning strategies and effective methods of assessment. The student should be trained to effectively communicate with patients and their relatives in a manner respectful of the patient's preferences, values, beliefs, confidentiality and privacy and to this purpose, a book on Attitude, Ethics & Communication was prepared by the Medical Council of India; the teaching faculty of medical colleges have been receiving training on this module since 2015.

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भारतीय आयुर्विज्ञान परिषद के अधिक्रमण में शासी बोर्ड
BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

-2-

Competency based Medical Education provides an effective outcome-based strategy where various domains of teaching including teaching learning methods and assessment form the framework of competencies. Keeping this objective as the core ingredient, the Medical Council of India with the help of panel of experts drawn from across the country, laid the basic framework for the revised undergraduate medical curriculum. Over the past four years, a group of highly committed medical professionals working as Members of the MCI Reconciliation Board developed this information into a document incorporating appropriate teaching-learning strategies, tools and techniques of teaching, and modes of assessment which have culminated in the current competency based undergraduate curriculum. We understand that maximum efforts were made to encourage integrated teaching between traditional subject areas using a problem-based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both the understanding and resolution of the problem. All efforts have been made to de-emphasize compartmentalisation of disciplines so as to achieve both horizontal and vertical integration in different phases. We are proud of their work accomplishment and congratulate them in the onerous task accomplished.

It gives us great satisfaction to state that the '**competency based undergraduate curriculum**' that has been prepared by the Medical Council of India would definitely serve the cause of medical education and in creating a competent Indian Medical Graduate to serve the community.

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COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

More than twenty years have passed since the existing Regulations on Graduate Medical Education, 1997 was notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2018 will reveal that the 2018 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender-sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

A significant attempt has been made in the outcome driven undergraduate curriculum to provide the orientation and the skills necessary for life-long learning to enable proper care of the patient. In particular, the curriculum provides for early clinical exposure, electives and longitudinal care. Skill acquisition is an indispensable component of the learning process in medicine. The curriculum reinforces this aspect by necessitating certification of certain essential skills. The experts and the writing group have factored in patient availability, access, consent, number of students in a class etc. in suggesting skill acquisition and assessment methods; use of skills labs, simulated and guided environments are encouraged. In the pre-internship years,- the highest level of skill acquisition is a show how (SH) in a simulated or guided environment; few skills require independent performance and certification - these are marked with P (for performance). Opportunity to ‘perform’ these skills will be available during internship.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

In addition to the above, an attempt has been made to allow students from diverse educational streams and backgrounds to transition appropriately through a Foundation Course. Dedicated time has been allotted for self directed learning and co-curricular activities.

Formative and internal assessments have been streamlined to achieve the objectives of the curriculum. Minor tweaks to the summative assessment have been made to reflect evolving thought and regulatory requirements. Curricular governance and support have been strengthened, increasing the involvement of Curriculum Committee and Medical Education Departments/Units.

The curriculum document in conjunction with the new Graduate Medical Education Regulations (GMR), when notified, must be seen as a “living document” that should evolve as stakeholder requirements and aspirations change. We hope that the current GMR does just that. The Medical Council of India is

grateful to all the teachers, subject experts, process experts, patients, students and trainees who have contributed through invaluable inputs, intellectual feedbacks and valuable time spent to make this possible. This document would not have been possible without the dedicated and unstinting intellectual, mental and time-consuming efforts of the members of the Reconciliation Board of the Council and the Academic Cell of MCI.

How to use the Manual

This Manual is intended for curriculum planners in an institution to design learning and assessment experiences for the MBBS student. Contents created by subject experts have been curated to provide guidance for the curriculum planners, leaders and teachers in medical schools. They must be used with reference to and in the context of the Regulations.

Section 1

Competencies for the Indian Medical Graduate

Section 1 - provides the global competencies extracted from the Graduate Medical Education Regulations, 2018. The global competencies identified as defining the roles of the **Indian Medical Graduate** are the broad competencies that the learner has to aspire to achieve; teachers and curriculum planners must ensure that the learning experiences are aligned to this Manual.

Extract from the Graduate Medical Education Regulations, 2018

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed:-

2.1. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- (a) recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.
- (b) learn every aspect of National policies on health and devote herself/himself to its practical implementation.
- (c) achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- (d) develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- (e) become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2.2. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

- (a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- (b) be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.
- (c) appreciate rationale for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects.
- (d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

- (e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.
- (f) be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
 - (i) Family Welfare and Maternal and Child Health (MCH);
 - (ii) Sanitation and water supply;
 - (iii) Prevention and control of communicable and non-communicable diseases;
 - (iv) Immunization;
 - (v) Health Education;
 - (vi) Indian Public Health Standards (IPHS) at various level of service delivery;
 - (vii) Bio-medical waste disposal; and
 - (viii) Organizational and or institutional arrangements.
- (g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal inventory skills and counseling.
- (h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.
- (i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- (j) be competent to work in a variety of health care settings.
- (k) have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate, as given in the Graduate Medical Education Regulations, 2018

2. 3. Goals for the Learner

In order to fulfil this goal, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

- 2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- 2.3.2. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.
- 2.3.3. Communicator with patients, families, colleagues and community.
- 2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.
- 2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. *Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion*

- 3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- 3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.
- 3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.

- 3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- 3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- 3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- 3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- 3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.
- 3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- 3.1.12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:
 - i) Disease prevention,
 - ii) Health promotion and cure,
 - iii) Pain and distress alleviation, and
 - iv) Rehabilitation and palliation.

- 3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.
- 3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- 3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.2. *Leader and member of the health care team and system*

- 3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- 3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- 3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
- 3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- 3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- 3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

3.3. *Communicator with patients, families, colleagues and community*

- 3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- 3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- 3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

3.4. Lifelong learner committed to continuous improvement of skills and knowledge

3.4.1. Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2. Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3. Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4. Demonstrate ability to search (including through electronic means), and critically reevaluate the medical literature and apply the information in the care of the patient.

3.4.5. Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5. *Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession*

3.5.1. Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2. Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3. Demonstrate ability to recognize and manage ethical and professional conflicts.

3.5.4. Abide by prescribed ethical and legal codes of conduct and practice.

3.5.5. Demonstrate a commitment to the growth of the medical profession as a whole.

Section 2

Subject-wise outcomes

Section 2 contains subject-wise outcomes so called “sub-competencies” that must be achieved at the end of instruction in that subject. These are organised in tables and have two parts. The core subject outcomes are in first part. The second part in the same document (titled Integration) contains outcomes/competencies in other subjects which have been identified by experts in those subjects as requiring alignment or integration with the core subject.

Outcomes (competencies) in each subject are grouped according to topics number-wise. It is important to review the individual outcomes (competencies) in the light of the topic outcomes as a whole. For each competency outlined - the learning domains (Knowledge, Skill, Attitude, Communication) are identified. The expected level of achievement in that subject is identified as – [knows (K), knows how (KH), shows how (SH), perform (P)]. As a rule, ‘perform’ indicates independent performance without supervision and is required rarely in the pre-internship period. The outcome is a core (Y - must achieve) or a non-core (N - desirable) outcome. Suggested learning and assessment methods (these are suggestions) and explanation of the terms used are given under the section “definitions used in this document”. The suggested number of times a skill must be performed independently for certification in the learner’s log book is also given. Last two columns indicate subjects within the same phase and other phases with which the topic can be taught - together - aligned (temporal coordination), shared, correlated or nested.

The number of topics and competencies in each subject are given below:

Topics & outcomes in Pre-clinical & Para-clinical subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	Human Anatomy	82	409
2.	Physiology	11	137
3.	Biochemistry	11	89
4.	Pharmacology	05	85
5.	Pathology	36	182
6.	Microbiology	08	54
7.	Forensic Medicine & Toxicology	14	162
	Total	167	1118

Topics & outcomes in Medicine and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	Community Medicine	20	107
2.	General Medicine	26	506
3.	Respiratory Medicine	02	47
4.	Pediatrics	35	406
5.	Psychiatry	19	117
6.	Dermatology, Venereology & Leprosy	18	73
7.	Physical Medicine & Rehabilitation	09	43
	Total	129	1299

Topics & outcomes in Surgery and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	General Surgery	30	133
2.	Ophthalmology	09	60
3.	Otorhinolaryngology	04	76
4.	Obstetrics & Gynaecology	38	126
5.	Orthopedics	14	39
6.	Anesthesiology	10	46
7.	Radiodiagnosis	01	13
8.	Radiotherapy	05	16
9.	Dentistry	05	23
	Total	116	532

Section 3

Sample topics used for alignment & integration

Section 3 contains a sample selection of topics that run across the phases which can be used for alignment and integration. These are suggestions and institutions can select their own set of topics which can run across phases.

It is important to design the curriculum with a view to ensure with several broad outcomes in mind: a) achievement of the broad competencies by the learner at the end of the MBBS program, b) retain the subject - wise character of learning and assessment and ensure that phase-wise subject outcomes are met and assessed, c) teaching topics that are similar together thereby reducing redundancy and allowing the learner to integrate the concept as the most important step in integration (alignment or temporal coordination) (see document on integration), and d) align learning and assessment experiences to the outcome and the level of achievement specified.

Understanding the competencies table

Understanding the competencies table

A	B	C	D	E	F	G	H	I	J
No.	Competencies	Domain	K/KH/SH/P	Core	Suggested Teaching Learning Method	Suggested Assessment method	No. required to certify (P)	Vertical Integration	Horizontal Integration
Physiology									
Summary Name of Topic: General Physiology Number of Competencies: (08)									
PY1.1	Describe the structure and functions of a	K	KH	Y	Lectures, Small group discussion	Written/Viva			Biochemistry
IM25.4	Elicit <i>document</i> and present a medical history that helps delineate the	S	SH	Y	Bed Side clinic, DOAP	Skill assessment		Community Medicine	

Unique number of the competency. First two alphabets represent the subject (see list); number following alphabet reflects topic number, following period is a running number.

Description of competency

Identifies the domain or domains addressed
 K - Knowledge
 S - Skill
 A - Attitude
 C - Communication

Identifies the level of competency required based on the Miller's pyramid
 K - Knows
 KH - Knows How
 S - Skill
 SH - Show How
 P - Perform independently

Identifies if the competency is core or desirable.
 Y indicates Core;
 N-non-core

Identifies the suggested learning method.
 DOAP - Demonstrate (by Student) Observe, Assist Perform)

Identifies the suggested assessment method
 Skill assessment - Clinics, Skills lab, Practicals etc.

no of times a skill needs to be done independently to be certified for independent performance;
 Rarely used in UG

Subject (s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding

Subject (s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding

***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning objectives from competencies

Deriving learning objectives from competencies

K	Knows	A knowledge attribute – Usually enumerates or describes
KH	Knows how	A higher level of knowledge – is able to discuss or analyse
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret / demonstrate a complex procedure requiring thought, knowledge and behaviour
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y

PA42.1*	At the end of the session the phase II student must be able to enumerate the most common causes of meningitis correctly
PA42.2*	At the end of the session the phase II student must be able to enumerate the components of CSF analysis correctly
PA42.3*	At the end of the session the phase II student must be able to describe the CSF features for a given etiology of meningitis accurately
PA42.4*	At the end of the session the phase II student must be able to identify the aetiology of meningitis correctly from a given set of CSF parameters

Audience - who will do the behavior

Behavior - What should the learner be able to do?

Condition - Under what conditions should the learner be able to do it?

Degree – How well must it be done

Objective: Statement of what a learner should be able to do at the end of a specific learning experience
***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning methods from competencies

Deriving learning methods from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the Phase II student must be able to enumerate the most common causes of meningitis correctly	Lecture	small group discussion
PA42.2*	At the end of the session the Phase II student must be able to enumerate the components of a CSF analysis correctly	Related objectives can be combined into one teaching session	
PA42.3*	At the end of the session the Phase II student must be able to describe the CSF features for a given etiologic of meningitis accurately		
PA42.4*	At the end of the session the Phase II student must the able to identify the aetiology of meningitis correctly from a given set of CSF parameters	small group discussion, practical session	

*Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents

Deriving assessment methods from competencies

Deriving assessment methods from competencies-1

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

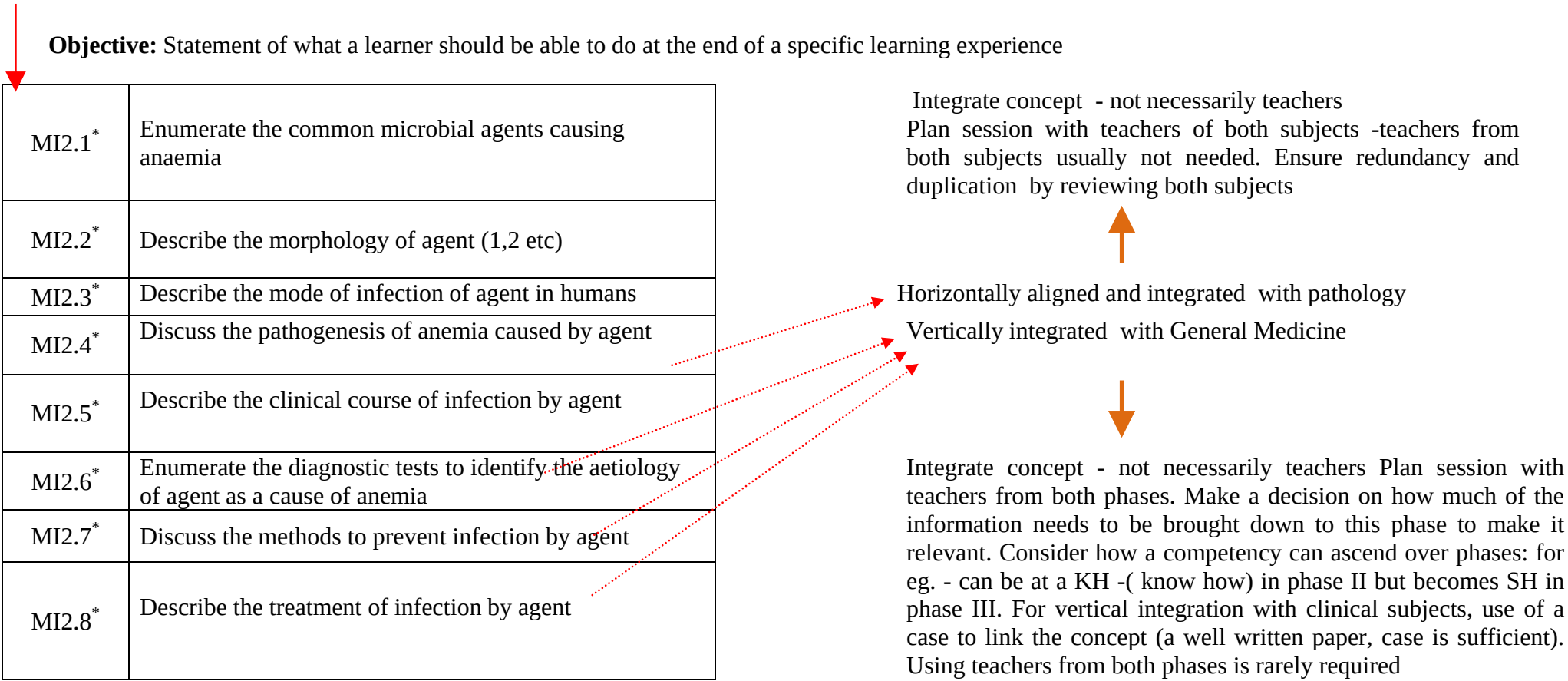
PA42.1*	At the end of the session the ~~Phase II student~~ must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.2*	At the end of the session the Phase II student must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA42.3*	At the end of the session the Phase II student must be able to describe the CSF features for a given aetiology of meningitis accurately	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA42.4*	At the end of the session the Phase II student must the able to identify the aetiology of meningitis correctly from a given set of CSF parameters	Short note / part of the structured essay/ Skill station/ Viva voce Review the CSF findings in the following patient and identify (write or vocalise) the most likely etiology

* Numbers given are for illustrative purposes only and should not be compared with numbers in the curriculum document

Deriving assessment methods from competencies-2

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

MI2.4*	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group discussion	Written/ Viva voce	Medicine	Pathology



The concept of integration

Concept of integration used in the Manual

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMR 2018 applies these principles to the extent that will retain the strengths of silo - based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind, the Regulations recommend temporal coordination as described by Harden (called alignment in this document) as the major method to be followed allowing similar topics in different subjects to be thought separately but during the same time frame (Figure 1a).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to Share (Figure 1b) topics or Correlate (Figure 1c) topics by using an integration session. The integration session most preferred will be a case based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed. Care must be taken to ensure that achievement phase - based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasized that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not it in its delivery unless deemed necessary.

As much as possible the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - Nesting (Figure 1d) (Harden). Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year.

Assessment will continue to be subject based. However, efforts must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalized and integrated the concept and its application.

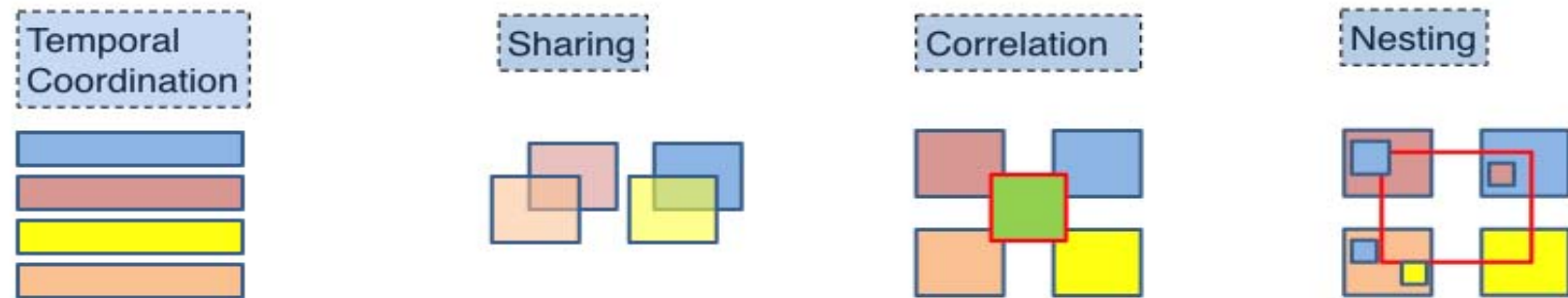


Figure 1 : Integration concepts framed in the GMR. Coloured boxes represent subjects. 1 a. Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. b. Sharing: Two disciplines may agree to plan and jointly implement a teaching program c. Correlation: the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border) d. Nesting: the teacher targets, within a subject-based course, skills relating to other subjects. Adapted from Harden R Med Edu 2000. 34; 551

Definitions used in the Manual

1. **Goal:** A projected state of affairs that a person or system plans to achieve.

In other words: Where do you want to go? or What do you want to become?
2. **Competency:** The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.

In other words: What should you have? or What should have changed?
3. **Objective:** Statement of what a learner should be able to do at the end of a specific learning experience.

In other words: What the Indian Medical Graduate should know, do, or behave.

Action Verbs used in this manual

Knowledge	Skill	Attitude/communicate
Enumerate	Identify	Counsel
List	Demonstrate	Inform
Describe	Perform under supervision	Demonstrate understanding of
Discuss	Perform independently	
Differentiate	Document	
Define	Present	
Classify	Record	
Choose	Interpret	
Elicit		
Report		

Note:

1. Specified essential competencies only will be required to be performed independently at the end of the final year MBBS.
2. The word ‘perform’ or ‘do’ is used ONLY if the task has to be done on patients or in laboratory practical in the pre/para- clinical phases.
3. Most tasks that require performance during undergraduate years will be performed under supervision.
4. If a certification to perform independently has been done, then the number of times the task has to be performed under supervision will be indicated in the last column.

Explanation of terms used in this manual

Lecture	Any instructional large group method including traditional lecture and interactive lecture
Small group discussion	Any instructional method involving small groups of students in an appropriate learning context
DOAP (Demonstration- Observation - Assistance - Performance)	A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently
Skill assessment	A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands
Core	A competency that is necessary in order to complete the requirements of the subject (traditional must know)
Non-Core	A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know)
National Guidelines	Health programs as relevant to the competency that are part of the National Health Program

Domains of learning

K	Knowledge
S	Skill
A	Attitude
C	Communication

Levels of competency

K	Knows	A knowledge attribute - Usually enumerates or describes
KH	Knows how	A higher level of knowledge - is able to discuss or analyze
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret/ demonstrate a complex procedure requiring thought, knowledge and behavior
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Note:

In the table of competency - the highest level of competency acquired is specified and implies that the lower levels have been acquired already. Therefore, when a student is able to SH - Show how - an informed consent is obtained - it is presumed that the preceding steps - the knowledge, the analytical skills, the skill of communicating have all been obtained.

It may also be noted that attainment of the highest level of competency may be obtained through steps spread over several subjects or phases and not necessarily in the subject or the phase in which the competency has been identified.

Volume I

Competency based Undergraduate Curriculum

in

Pre-clinical and Para-clinical subjects

HUMAN ANATOMY (CODE: AN)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Human Anatomy									
Topic: Anatomical terminology		Number of competencies: (2)			Number of procedures for certification: (NIL)				
AN1.1	Demonstrate normal anatomical position, various planes, relation, comparison, laterality & movement in our body	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/skills assessment			
AN1.2	Describe composition of bone and bone marrow	K	KH	Y	Lecture	Written/ Viva voce			
Topic: General features of bones & Joints		Number of competencies: (6)			Number of procedures for certification: (NIL)				
AN2.1	Describe parts, blood and nerve supply of a long bone	K	KH	Y	Lecture, DOAP session	Written/ Viva voce			
AN2.2	Enumerate laws of ossification	K	KH	N	Lecture	Written			
AN2.3	Enumerate special features of a sesamoid bone	K	KH	N	Lecture	Written			
AN2.4	Describe various types of cartilage with its structure & distribution in body	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
AN2.5	Describe various joints with subtypes and examples	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
AN2.6	Explain the concept of nerve supply of joints & Hilton's law	K	KH	Y	Lecture	Written/ Viva voce			
Topic: General features of Muscle		Number of competencies: (3)			Number of procedures for certification: (NIL)				
AN3.1	Classify muscle tissue according to structure & action	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN3.2	Enumerate parts of skeletal muscle and differentiate between tendons and aponeuroses with examples	K	KH	Y	Lecture	Written/ Viva voce			
AN3.3	Explain Shunt and spurt muscles	K	KH	N	Lecture	Written			
Topic: General features of skin and fascia		Number of competencies: (5)			Number of procedures for certification: (NIL)				
AN4.1	Describe different types of skin & dermatomes in body	K	KH	N	Lecture, DOAP session	Written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN4.2	Describe structure & function of skin with its appendages	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.3	Describe superficial fascia along with fat distribution in body	K	KH	Y	Lecture, DOAP session	Written/ Viva voce			
AN4.4	Describe modifications of deep fascia with its functions	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.5	Explain principles of skin incisions	K	KH	N	Lecture	Written		Dermatology, Venereology & Leprosy	
Topic: General features of the cardiovascular system Number of competencies: (8) Number of procedures for certification: (NIL)									
AN5.1	Differentiate between blood vascular and lymphatic system	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.2	Differentiate between pulmonary and systemic circulation	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.3	List general differences between arteries & veins	K	KH	Y	Lecture	Written/ Viva voce			
AN5.4	Explain functional difference between elastic, muscular arteries and arterioles	K	KH	Y	Lecture	Written/ Viva voce			
AN5.5	Describe portal system giving examples	K	KH	Y	Lecture	Written/ Viva voce			
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN5.7	Explain function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses	K	KH	N	Lecture	Written			Physiology
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology
Topic: General Features of lymphatic system Number of competencies: (3) Number of procedures for certification: (NIL)									
AN6.1	List the components and functions of the lymphatic system	K	KH	N	Lecture	Written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN6.2	Describe structure of lymph capillaries & mechanism of lymph circulation	K	KH	N	Lecture	Written			
AN6.3	Explain the concept of lymphoedema and spread of tumors via lymphatics and venous system	K	KH	N	Lecture	Written		General Surgery	
Topic: Introduction to the nervous system Number of competencies: (8) Number of procedures for certification: (NIL)									
AN7.1	Describe general plan of nervous system with components of central, peripheral & autonomic nervous systems	K	KH	Y	Lecture	Written			
AN7.2	List components of nervous tissue and their functions	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.3	Describe parts of a neuron and classify them based on number of neurites, size & function	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.4	Describe structure of a typical spinal nerve	K	KH	Y	Lecture	Written/ Viva voce			
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.6	Describe concept of loss of innervation of a muscle with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
AN7.7	Describe various type of synapse	K	KH	N	Lecture	Written			Physiology
AN7.8	Describe differences between sympathetic and spinal ganglia	K	KH	N	Lecture	Written			
Topic: Features of individual bones (Upper Limb) Number of competencies: (6) Number of procedures for certification: (NIL)									
AN8.1	Identify the given bone, its side, important features & keep it in anatomical position	K/S	SH	Y	DOAP session	Viva voce/ Practicals/ OSPE			
AN8.2	Identify & describe joints formed by the given bone	K/S	SH	Y	Lecture, DOAP session	Viva voce			
AN8.3	Enumerate peculiarities of clavicle	K	KH	Y	Lecture, DOAP session	Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN8.4	Demonstrate important muscle attachment on the given bone	K/S	SH	Y	Practical DOAP session, Small group teaching	Viva voce Practicals		Orthopedics	
AN8.5	Identify and name various bones in articulated hand, Specify the parts of metacarpals and phalanges and enumerate the peculiarities of pisiform	K/S	SH	Y	Practical, F91 DOAP session, Small group teaching	Viva voce Practicals			
AN8.6	Describe scaphoid fracture and explain the anatomical basis of avascular necrosis	K	KH	N	DOAP session	Viva voce		Orthopedics	
Topic: Pectoral region Number of competencies: (3) Number of procedures for certification: (NIL)									
AN9.1	Describe attachment, nerve supply & action of pectoralis major and pectoralis minor	K	KH	Y	Lecture, Practical	Written			
AN9.2	Breast: Describe the location, extent, deep relations, structure, age changes, blood supply, lymphatic drainage, microanatomy and applied anatomy of breast	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN9.3	Describe development of breast	K	KH	N	Lecture	Written			
Topic: Axilla, Shoulder and Scapular region Number of competencies: (13) Number of procedures for certification: (NIL)									
AN10.1	Identify & describe boundaries and contents of axilla	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.2	Identify, describe and demonstrate the origin, extent, course, parts, relations and branches of axillary artery & tributaries of vein	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.3	Describe, identify and demonstrate formation, branches, relations, area of supply of branches, course and relations of terminal branches of brachial plexus	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN10.4	Describe the anatomical groups of axillary lymph nodes and specify their areas of drainage	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN10.5	Explain variations in formation of brachial plexus	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN10.6	Explain the anatomical basis of clinical features of Erb's palsy and Klumpke's paralysis	K	KH	N	Lecture	Written		General Surgery	
AN10.7	Explain anatomical basis of enlarged axillary lymph nodes	K	KH	N	Lecture	Written		General Surgery	
AN10.8	Describe, identify and demonstrate the position, attachment, nerve supply and actions of trapezius and latissimus dorsi	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.9	Describe the arterial anastomosis around the scapula and mention the boundaries of triangle of auscultation	K	KH	N	Lecture	Written			
AN10.10	Describe and identify the deltoid and rotator cuff muscles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.11	Describe & demonstrate attachment of serratus anterior with its action	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.12	Describe and demonstrate shoulder joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Orthopedics	
AN10.13	Explain anatomical basis of Injury to axillary nerve during intramuscular injections	K	KH	N	Lecture	Viva voce			
Topic: Arm & Cubital fossa Number of competencies: (6) Number of procedures for certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN11.1	Describe and demonstrate muscle groups of upper arm with emphasis on biceps and triceps brachii	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.2	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels in arm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.3	Describe the anatomical basis of Venepuncture of cubital veins	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN11.4	Describe the anatomical basis of Saturday night paralysis	K	KH	Y	Practical, Lecture	Written/ Viva voce		Orthopedics	
AN11.5	Identify & describe boundaries and contents of cubital fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.6	Describe the anastomosis around the elbow joint	K	KH	N	Lecture	Written			
Topic: Forearm & hand Number of competencies: (15) Number of procedures for certification: (NIL)									
AN12.1	Describe and demonstrate important muscle groups of ventral forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.2	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.3	Identify & describe flexor retinaculum with its attachments	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN12.4	Explain anatomical basis of carpal tunnel syndrome	K	KH	Y	Lecture	Written/ Viva voce			
AN12.5	Identify & describe small muscles of hand. Also describe movements of thumb and muscles involved	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.6	Describe & demonstrate movements of thumb and muscles involved	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.7	Identify & describe course and branches of important blood vessels and nerves in hand	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.8	Describe anatomical basis of Claw hand	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN12.9	Identify & describe fibrous flexor sheaths, ulnar bursa, radial bursa and digital synovial sheaths	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.10	Explain infection of fascial spaces of palm	K	KH	N	Lecture	Written		General Surgery	
AN12.11	Identify, describe and demonstrate important muscle groups of dorsal forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.12	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.13	Describe the anatomical basis of Wrist drop	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN12.14	Identify & describe compartments deep to extensor retinaculum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.15	Identify & describe extensor expansion formation	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: General Features, Joints, radiographs & surface marking Number of competencies: (8) Number of procedures for certification: (NIL)									
AN13.1	Describe and explain Fascia of upper limb and compartments, veins of upper limb and its lymphatic drainage	K	KH	Y	Lecture	Written/ Viva voce			
AN13.2	Describe dermatomes of upper limb	K	KH	N	Lecture	Written/ Viva voce			
AN13.3	Identify & describe the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, blood and nerve supply of elbow joint, proximal and distal radio-ulnar joints, wrist joint & first carpometacarpal joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN13.4	Describe Sternoclavicular joint, Acromioclavicular joint, Carpometacarpal joints & Metacarpophalangeal joint	K	KH	N	Lecture	Written			
AN13.5	Identify the bones and joints of upper limb seen in anteroposterior and lateral view radiographs of shoulder region, arm, elbow, forearm and hand	K/S	SH	Y	Practical, Small group discussion, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	
AN13.6	Identify & demonstrate important bony landmarks of upper limb: Jugular notch, sternal angle, acromial angle, spine of the scapula, vertebral level of the medial end, Inferior angle of the scapula	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			
AN13.7	Identify & demonstrate surface projection of: Cephalic and basilic vein, Palpation of Brachial artery, Radial artery, Testing of muscles: Trapezius, pectoralis major, serratus anterior, latissimus dorsi, deltoid, biceps brachii, Brachioradialis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN13.8	Describe development of upper limb	K	KH	N	Lecture	Written			
Features of individual bones (Lower Limb) Number of competencies: (4) Number of procedures for certification: (NIL)									
AN14.1	Identify the given bone, its side, important features & keep it in anatomical position	K/S	SH	Y	DOAP session	Viva voce			
AN14.2	Identify & describe joints formed by the given bone	K/S	SH	Y	Lecture, DOAP session	Viva voce			
AN14.3	Describe the importance of ossification of lower end of femur & upper end of tibia	K	KH	Y	Lecture	Viva voce/ Practicals		Forensic Medicine & Toxicology	
AN14.4	Identify and name various bones in the articulated foot with individual muscle attachment	K/S	SH	N	Practical, DOAP session, Small group teaching	Viva voce/ Practicals			
Topic: Front & Medial side of thigh Number of competencies: (5) ♂ Number of procedures for certification: (NIL)									
AN15.1	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior thigh	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN15.2	Describe and demonstrate major muscles with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN15.3	Describe and demonstrate boundaries, floor, roof and contents of femoral triangle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN15.4	Explain anatomical basis of Psoas abscess & Femoral hernia	K	KH	N	Lecture, DOAP session	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN15.5	Describe and demonstrate adductor canal with its content	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: Gluteal region & back of thigh Number of competencies: (6) Number of procedures for certification: (NIL)									
AN16.1	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of gluteal region	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.2	Describe anatomical basis of sciatic nerve injury during gluteal intramuscular injections	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.3	Explain the anatomical basis of Trendelenburg sign	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.4	Describe and demonstrate the hamstrings group of muscles with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.5	Describe and demonstrate the origin, course, relations, branches (or tributaries), termination of important nerves and vessels on the back of thigh	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.6	Describe and demonstrate the boundaries, roof, floor, contents and relations of popliteal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: Hip Joint Number of competencies: (3) Number of procedures for certification: (NIL)									
AN17.1	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the hip joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN17.2	Describe anatomical basis of complications of fracture neck of femur	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN17.3	Describe dislocation of hip joint and surgical hip replacement	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: Knee joint, Anterolateral compartment of leg & dorsum of foot Number of competencies: (7) ♂ Number of procedures for certification: (NIL)									
AN18.1	Describe and demonstrate major muscles of anterolateral compartment of leg with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.2	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior compartment of leg	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.3	Explain the anatomical basis of foot drop	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN18.4	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the knee joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.5	Explain the anatomical basis of locking and unlocking of the knee joint	K	KH	Y	Small group teaching	Written/ Viva voce			
AN18.6	Describe knee joint injuries with its applied anatomy	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN18.7	Explain anatomical basis of Osteoarthritis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: Back of Leg & Sole Number of competencies: (7) Number of procedures for certification: (NIL)									
AN19.1	Describe and demonstrate the major muscles of back of leg with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN19.2	Describe and demonstrate the origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of leg	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN19.3	Explain the concept of "Peripheral heart"	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN19.4	Explain the anatomical basis of rupture of calcaneal tendon	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.5	Describe factors maintaining importance arches of the foot with its importance	K	KH	Y	Lecture	Written/ Viva voce			
AN19.6	Explain the anatomical basis of Flat foot & Club foot	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.7	Explain the anatomical basis of Metatarsalgia & Plantar fasciitis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: General Features, Joints, radiographs & surface marking Number of competencies: (10) Number of procedures for certification: (NIL)									
AN20.1	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply of tibiofibular and ankle joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN20.2	Describe the subtalar and transverse tarsal joints	K	KH	N	Lecture, DOAP session	Written/ Viva voce			
AN20.3	Describe and demonstrate Fascia lata, Venous drainage, Lymphatic drainage, Retinacula & Dermatomes of lower limb	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN20.4	Explain anatomical basis of enlarged inguinal lymph nodes	K	KH	N	Lecture	Written/ Viva voce		General Surgery	
AN20.5	Explain anatomical basis of varicose veins and deep vein thrombosis	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN20.6	Identify the bones and joints of lower limb seen in anteroposterior and lateral view radiographs of various regions of lower limb	K/S	SH	Y	Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN20.7	Identify & demonstrate important bony landmarks of lower limb: -Vertebral levels of highest point of iliac crest, posterior superior iliac spines, iliac tubercle, pubic tubercle, ischial tuberosity, adductor tubercle, -Tibial tuberosity, head of fibula, -Medial and lateral malleoli, Condyles of femur and tibia, sustentaculum tali, tuberosity of fifth metatarsal, tuberosity of the navicular	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			
AN20.8	Identify & demonstrate palpation of femoral, popliteal, post tibial, anti tibial & dorsalis pedis blood vessels in a simulated environment	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Medicine	
AN20.9	Identify & demonstrate Palpation of vessels (femoral, popliteal, dorsalis pedis, post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, Great and small saphenous veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Medicine, General Surgery	
AN20.10	Describe basic concept of development of lower limb	K	KH	N	Lecture	Viva voce			
Topic: Thoracic cage Number of competencies: (11) Number of procedures for certification: (NIL)									
AN21.1	Identify and describe the salient features of sternum, typical rib, 1 st rib and typical thoracic vertebra	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN21.2	Identify & describe the features of 2 nd , 11 th and 12 th ribs, 1 st , 11 th and 12 th thoracic vertebrae	K/S	SH	N	Lecture, DOAP session	Viva voce/ skill assessment			
AN21.3	Describe & demonstrate the boundaries of thoracic inlet, cavity and outlet	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.4	Describe & demonstrate extent, attachments, direction of fibres, nerve supply and actions of intercostal muscles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN21.5	Describe & demonstrate origin, course, relations and branches of a typical intercostal nerve	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.6	Mention origin, course and branches/ tributaries of: 1) anterior & posterior intercostal vessels 2) internal thoracic vessels	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN21.7	Mention the origin, course, relations and branches of 1) atypical intercostal nerve 2) superior intercostal artery, subcostal artery	K	KH	N	Lecture	Written			
AN21.8	Describe & demonstrate type, articular surfaces & movements of manubriosternal, costovertebral, costotransverse and xiphisternal joints	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.9	Describe & demonstrate mechanics and types of respiration	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN21.10	Describe costochondral and interchondral joints	K	KH	N	Lecture	Written			
AN21.11	Mention boundaries and contents of the superior, anterior, middle and posterior mediastinum	K	KH	Y	Practical, Lecture	Written/ Viva voce			
Topic: Heart & Pericardium Number of competencies: (7) Number of procedures for certification: (NIL)									
AN22.1	Describe & demonstrate subdivisions, sinuses in pericardium, blood supply and nerve supply of pericardium	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN22.2	Describe & demonstrate external and internal features of each chamber of heart	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN22.3	Describe & demonstrate origin, course and branches of coronary arteries	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN22.4	Describe anatomical basis of ischaemic heart disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN22.5	Describe & demonstrate the formation, course, tributaries and termination of coronary sinus	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN22.6	Describe the fibrous skeleton of heart	K	KH	Y	Lecture	Written			
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
Topic: Mediastinum Number of competencies: (7) Number of procedures for certification: (NIL)									
AN23.1	Describe & demonstrate the external appearance, relations, blood supply, nerve supply, lymphatic drainage and applied anatomy of oesophagus	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN23.2	Describe & demonstrate the extent, relations tributaries of thoracic duct and enumerate its applied anatomy	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN23.3	Describe & demonstrate origin, course, relations, tributaries and termination of superior venacava, azygos, hemiazygos and accessory hemiazygos veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN23.4	Mention the extent, branches and relations of arch of aorta & descending thoracic aorta	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN23.5	Identify & Mention the location and extent of thoracic sympathetic chain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN23.6	Describe the splanchnic nerves	K	KH	N	Lecture	Written			
AN23.7	Mention the extent, relations and applied anatomy of lymphatic duct	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Lungs & Trachea Number of competencies: (6) Number of procedures for certification: (NIL)									
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.4	Identify phrenic nerve & describe its formation & distribution	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
AN24.5	Mention the blood supply, lymphatic drainage and nerve supply of lungs	K	KH	Y	Lecture	Written/ Viva voce			
AN24.6	Describe the extent, length, relations, blood supply, lymphatic drainage and nerve supply of trachea	K	KH	N	Lecture	Written			
Topic: Thorax Number of competencies: (9) Number of procedures for certification: (01)									
AN25.1	Identify, draw and label a slide of trachea and lung	K/S	SH	Y	Lecture, Practical	Written/ skill assessment	1		
AN25.2	Describe development of pleura, lung & heart	K	KH	Y	Lecture	Written			
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.6	Mention development of aortic arch arteries, SVC, IVC and coronary sinus	K	KH	N	Lecture	Written/ Viva voce			
AN25.7	Identify structures seen on a plain x-ray chest (PA view)	K/S	SH	Y	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.8	Identify and describe in brief a barium swallow	K/S	SH	N	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.9	Demonstrate surface marking of lines of pleural reflection, lung borders and fissures, trachea, heart borders, apex beat & surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
Topic: Skull osteology Number of competencies: (7) Number of procedures for certification: (NIL)									
AN26.1	Demonstrate anatomical position of skull, Identify and locate individual skull bones in skull	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.2	Describe the features of norma frontalis, verticalis, occipitalis, lateralis and basalis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.3	Describe cranial cavity, its subdivisions, foramina and structures passing through them	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.4	Describe morphological features of mandible	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.5	Describe features of typical and atypical cervical vertebrae (atlas and axis)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.6	Explain the concept of bones that ossify in membrane	K	KH	N	Lecture	Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN26.7	Describe the features of the 7 th cervical vertebra	K/S	SH	N	DOAP session	Viva voce			
Topic: Scalp Number of competencies: (2) Number of procedures for certification: (NIL)									
AN27.1	Describe the layers of scalp, its blood supply, its nerve supply and surgical importance	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN27.2	Describe emissary veins with its role in spread of infection from extracranial route to intracranial venous sinuses	K	KH	Y	Lecture	Written			
Topic: Face & parotid region Number of competencies: (10) Number of procedures for certification: (NIL)									
AN28.1	Describe & demonstrate muscles of facial expression and their nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.2	Describe sensory innervation of face	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN28.3	Describe & demonstrate origin /formation, course, branches /tributaries of facial vessels	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.4	Describe & demonstrate branches of facial nerve with distribution	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.5	Describe cervical lymph nodes and lymphatic drainage of head, face and neck	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN28.6	Identify superficial muscles of face, their nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.7	Explain the anatomical basis of facial nerve palsy	K	KH	Y	Lecture	Written		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN28.8	Explain surgical importance of deep facial vein	K	KH	Y	Lecture	Written		General Surgery	
AN28.9	Describe & demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN28.10	Explain the anatomical basis of Frey's syndrome	K	KH	N	Lecture	Written		General Surgery	
Topic: Posterior triangle of neck Number of competencies: (4) Number of procedures for certification: (NIL)									
AN29.1	Describe & demonstrate attachments, nerve supply, relations and actions of sternocleidomastoid	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN29.2	Explain anatomical basis of Erb's & Klumpke's palsy	K	KH	Y	Lecture	Written		General Surgery	
AN29.3	Explain anatomical basis of wry neck	K	KH	N	Lecture	Written		General Surgery	
AN29.4	Describe & demonstrate attachments of 1) inferior belly of omohyoid, 2)scalenus anterior, 3) scalenus medius & 4) levator scapulae	K/S	SH	N	Lecture, Practical	Written/ Viva voce			
Topic: Cranial cavity Number of competencies: (5) Number of procedures for certification: (NIL)									
AN30.1	Describe the cranial fossae & identify related structures	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN30.2	Describe & identify major foramina with structures passing through them	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN30.3	Describe & identify dural folds & dural venous sinuses	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN30.4	Describe clinical importance of dural venous sinuses	K	KH	Y	Lecture	Written			
AN30.5	Explain effect of pituitary tumours on visual pathway	K	KH	N	Lecture	Written		Ophthalmology	
Topic: Orbit Number of competencies: (5) Number of procedures for certification: (NIL)									
AN31.1	Describe & identify extra ocular muscles of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN31.2	Describe & demonstrate nerves and vessels in the orbit	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN31.3	Describe anatomical basis of Horner's syndrome	K	KH	N	Lecture	Written		Ophthalmology	
AN31.4	Enumerate components of lacrimal apparatus	K	KH	Y	Lecture	Written			
AN31.5	Explain the anatomical basis of oculomotor, trochlear and abducent nerve palsies along with strabismus	K	KH	Y	Lecture	Written		Ophthalmology	
Topic: Anterior Triangle Number of competencies: (2) Number of procedures for certification: (NIL)									
AN32.1	Describe boundaries and subdivisions of anterior triangle	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN32.2	Describe & demonstrate boundaries and contents of muscular, carotid, digastric and submental triangles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: Temporal and Infratemporal regions Number of competencies: (5) Number of procedures for certification: (NIL)									
AN33.1	Describe & demonstrate extent, boundaries and contents of temporal and infratemporal fossae	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN33.2	Describe & demonstrate attachments, direction of fibres, nerve supply and actions of muscles of mastication	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN33.3	Describe & demonstrate articulating surface, type & movements of temporomandibular joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN33.4	Explain the clinical significance of pterygoid venous plexus	K	KH	Y	Lecture	Written		General Surgery	
AN33.5	Describe the features of dislocation of temporomandibular joint	K	KH	N	Lecture	Written		General Surgery	
Topic: Submandibular region Number of competencies: (2) Number of procedures for certification: (NIL)									
AN34.1	Describe & demonstrate the morphology, relations and nerve supply of submandibular salivary gland & submandibular ganglion	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN34.2	Describe the basis of formation of submandibular stones	K	KH	N	Lecture	Written		General Surgery	
Topic: Deep structures in the neck Number of competencies: (10) Number of procedures for certification: (NIL)									
AN35.1	Describe the parts, extent, attachments, modifications of deep cervical fascia	K	KH	Y	Lecture	Written			
AN35.2	Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN35.3	Demonstrate & describe the origin, parts, course & branches subclavian artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN35.4	Describe & demonstrate origin, course, relations, tributaries and termination of internal jugular & brachiocephalic veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN35.5	Describe and demonstrate extent, drainage & applied anatomy of cervical lymph nodes	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN35.6	Describe and demonstrate the extent, formation, relation & branches of cervical sympathetic chain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN35.7	Describe the course and branches of IX, X, XI & XII nerve in the neck	K	KH	Y	Lecture	Written			
AN35.8	Describe the anatomically relevant clinical features of Thyroid swellings	K	KH	N	Lecture	Written		General Surgery	
AN35.9	Describe the clinical features of compression of subclavian artery and lower trunk of brachial plexus by cervical rib	K	KH	N	Lecture	Written		General Surgery	
AN35.10	Describe the fascial spaces of neck	K	KH	N	Lecture	Written			
Topic: Mouth, Pharynx & Palate Number of competencies: (5) Number of procedures for certification: (NIL)									
AN36.1	Describe the 1) morphology, relations, blood supply and applied anatomy of palatine tonsil 2) composition of soft palate	K	KH	Y	Lecture	Written		ENT	
AN36.2	Describe the components and functions of Waldeyer's lymphatic ring	K	KH	Y	Lecture	Written		ENT	
AN36.3	Describe the boundaries and clinical significance of pyriform fossa	K	KH	N	Lecture	Written		ENT	
AN36.4	Describe the anatomical basis of tonsillitis, tonsillectomy, adenoids and peri-tonsillar abscess	K	KH	N	Lecture	Written		ENT	
AN36.5	Describe the clinical significance of Killian's dehiscence	K	KH	N	Lecture	Written		ENT	
Topic: Cavity of Nose Number of competencies: (3) Number of procedures for certification: (NIL)									
AN37.1	Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN37.2	Describe location and functional anatomy of paranasal sinuses	K	KH	Y	Lecture	Written		ENT	
AN37.3	Describe anatomical basis of sinusitis & maxillary sinus tumours	K	KH	N	Lecture	Written		ENT	
Topic: Larynx Number of competencies: (3) Number of procedures for certification: (NIL)									
AN38.1	Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN38.2	Describe the anatomical aspects of laryngitis	K	KH	N	Lecture	Written		ENT	
AN38.3	Describe anatomical basis of recurrent laryngeal nerve injury	K	KH	N	Lecture	Written		ENT	
Topic: Tongue Number of competencies: (2) Number of procedures for certification: (NIL)									
AN39.1	Describe & demonstrate the morphology, nerve supply, embryological basis of nerve supply, blood supply, lymphatic drainage and actions of extrinsic and intrinsic muscles of tongue	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN39.2	Explain the anatomical basis of hypoglossal nerve palsy	K	KH	N	Lecture	Written		ENT	
Topic: Organs of hearing and equilibrium Number of competencies: (5) Number of procedures for certification: (NIL)									
AN40.1	Describe & identify the parts, blood supply and nerve supply of external ear	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.2	Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.3	Describe the features of internal ear	K	KH	N	Lecture	Written		ENT	
AN40.4	Explain anatomical basis of otitis externa and otitis media	K	KH	N	Lecture	Written		ENT	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN40.5	Explain anatomical basis of myringotomy	K	KH	N	Lecture	Written		ENT	
Topic: Eyeball Number of competencies: (3) Number of procedures for certification: (NIL)									
AN41.1	Describe & demonstrate parts and layers of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Ophthalmology	
AN41.2	Describe the anatomical aspects of cataract, glaucoma & central retinal artery occlusion	K	KH	N	Lecture	Written		Ophthalmology	
AN41.3	Describe the position, nerve supply and actions of intraocular muscles	K	KH	N	Lecture	Written		Ophthalmology	
Topic: Back Region Number of competencies: (3) Number of procedures for certification: (NIL)									
AN42.1	Describe the contents of the vertebral canal	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN42.2	Describe & demonstrate the boundaries and contents of Suboccipital triangle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN42.3	Describe the position, direction of fibres, relations, nerve supply, actions of semispinalis capitis and splenius capitis	K	KH	N	Lecture	Written			
Topic: Head & neck Joints, Histology, Development, Radiography & Surface marking Number of competencies: (9) Number of procedures for certification: (NIL)									
AN43.1	Describe & demonstrate the movements with muscles producing the movements of atlantooccipital joint & atlantoaxial joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN43.2	Identify, describe and draw the microanatomy of pituitary gland, thyroid, parathyroid gland, tongue, salivary glands, tonsil, epiglottis, cornea, retina	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN43.3	Identify, describe and draw microanatomy of olfactory epithelium, eyelid, lip, sclero-corneal junction, optic nerve, cochlea- organ of corti, pineal gland	K/S	SH	N	Lecture, Practical	Written/ skill assessment			
AN43.4	Describe the development and developmental basis of congenital anomalies of face, palate, tongue, branchial apparatus, pituitary gland, thyroid gland & eye	K	KH	Y	Lecture	Written/ Viva voce			
AN43.5	Demonstrate- 1) Testing of muscles of facial expression, extraocular muscles, muscles of mastication, 2) Palpation of carotid arteries, facial artery, superficial temporal artery, 3) Location of internal and external jugular veins, 4) Location of hyoid bone, thyroid cartilage and cricoid cartilage with their vertebral levels	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Surgery	
AN43.6	Demonstrate surface projection of- Thyroid gland, Parotid gland and duct, Pterion, Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & accessory nerve	K/S	SH	N	Practical	Viva voce/ skill assessment		General Surgery	
AN43.7	Identify the anatomical structures in 1) Plain x-ray skull, 2) AP view and lateral view 3) Plain x-ray cervical spine-AP and lateral view 4) Plain x-ray of paranasal sinuses	K/S	SH	Y	Practical	Viva voce/ skill assessment		Radiodiagnosis	
AN43.8	Describe the anatomical route used for carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ skill assessment		Radiodiagnosis	
AN43.9	Identify anatomical structures in carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ skill assessment		Radiodiagnosis	
Topic: Anterior abdominal wall Number of competencies: (7) Number of procedures for certification: (NIL)									
AN44.1	Describe & demonstrate the Planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.2	Describe & identify the Fascia, nerves & blood vessels of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN44.3	Describe the formation of rectus sheath and its contents	K	KH	Y	Lecture	Written/ Viva voce			
AN44.4	Describe & demonstrate extent, boundaries, contents of Inguinal canal including Hesselbach's triangle.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.5	Explain the anatomical basis of inguinal hernia.	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN44.6	Describe & demonstrate attachments of muscles of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.7	Enumerate common Abdominal incisions	K	KH	N	Lecture	Written		General Surgery	
Topic: Posterior abdominal wall Number of competencies: (3) Number of procedures for certification: (NIL)									
AN45.1	Describe Thoracolumbar fascia	K	KH	Y	Lecture	Written			
AN45.2	Describe & demonstrate Lumbar plexus for its root value, formation & branches	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN45.3	Mention the major subgroups of back muscles, nerve supply and action	K	KH	N	Lecture	Written			
Topic: Male external genitalia Number of competencies: (5) Number of procedures for certification: (NIL)									
AN46.1	Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN46.2	Describe parts of Epididymis	K	KH	Y	Lecture, Practical	Written/ Viva voce			
AN46.3	Describe Penis under following headings: (parts, components, blood supply and lymphatic drainage)	K	KH	Y	Lecture, Practical	Written/ Viva voce			
AN46.4	Explain the anatomical basis of Varicocoele	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN46.5	Explain the anatomical basis of Phimosis & Circumcision	K	KH	N	Lecture	Written		General Surgery	
Topic: Abdominal cavity Number of competencies: (14) Number of procedures for certification: (NIL)									
AN47.1	Describe & identify boundaries and recesses of Lesser & Greater sac	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.2	Name & identify various peritoneal folds & pouches with its explanation	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.3	Explain anatomical basis of Ascites & Peritonitis	K	KH	N	Lecture	Written		General Surgery	
AN47.4	Explain anatomical basis of Subphrenic abscess	K	KH	N	Lecture	Written		General Surgery	
AN47.5	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.6	Explain the anatomical basis of Splenic notch, Accessory spleens, Kehr's sign, Different types of vagotomy, Liver biopsy (site of needle puncture), Referred pain in cholecystitis, Obstructive jaundice, Referred pain around umbilicus, Radiating pain of kidney to groin & Lymphatic spread in carcinoma stomach	K	KH	N	Lecture	Written		General Surgery	
AN47.7	Mention the clinical importance of Calot's triangle	K	KH	N	Lecture	Written		General Surgery	
AN47.8	Describe & identify the formation, course relations and tributaries of Portal vein, Inferior vena cava & Renal vein	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.9	Describe & identify the origin, course, important relations and branches of Abdominal aorta, Coeliac trunk, Superior mesenteric, Inferior mesenteric & Common iliac artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN47.10	Enumerate the sites of portosystemic anastomosis	K	KH	Y	Lecture	Written		General Surgery	
AN47.11	Explain the anatomic basis of hematemesis& caput medusae in portal hypertension	K	KH	Y	Lecture,	Written/ Viva voce		General Surgery	
AN47.12	Describe important nerve plexuses of posterior abdominal wall	K	KH	N	Lecture	Written			
AN47.13	Describe & demonstrate the attachments, openings, nerve supply & action of the thoracoabdominal diaphragm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.14	Describe the abnormal openings of thoracoabdominal diaphragm and diaphragmatic hernia	K	KH	N	Lecture	Written		General Surgery	
Topic: Pelvic wall and viscera Number of competencies: (8) Number of procedures for certification: (NIL)									
AN48.1	Describe & identify the muscles of Pelvic diaphragm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.2	Describe & demonstrate the (position, features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of) important male & female pelvic viscera	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.3	Describe & demonstrate the origin, course, important relations and branches of internal iliac artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.4	Describe the branches of sacral plexus	K	KH	Y	Lecture	Written			
AN48.5	Explain the anatomical basis of suprapubic cystostomy, Urinary obstruction in benign prostatic hypertrophy, Retroverted uterus, Prolapse uterus, Internal and external haemorrhoids, Anal fistula, Vasectomy, Tubal pregnancy & Tubal ligation	K	KH	N	Lecture	Written		General Surgery	
AN48.6	Describe the neurological basis of Automatic bladder	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN48.7	Mention the lobes involved in benign prostatic hypertrophy & prostatic cancer	K	KH	N	Lecture	Written		General Surgery	
AN48.8	Mention the structures palpable during vaginal & rectal examination	K	KH	N	Lecture	Written		Obstetrics & Gynaecology General Surgery	
Topic: Perineum Number of competencies: (5) Number of procedures for certification: (NIL)									
AN49.1	Describe & demonstrate the superficial & deep perineal pouch (boundaries and contents)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.2	Describe & identify Perineal body	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.3	Describe & demonstrate Perineal membrane in male & female	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN49.4	Describe & demonstrate boundaries, content & applied anatomy of Ischiorectal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN49.5	Explain the anatomical basis of Perineal tear, Episiotomy, Perianal abscess and Anal fissure	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: Vertebral column Number of competencies: (4) Number of procedures for certification: (NIL)									
AN50.1	Describe the curvatures of the vertebral column	K	KH	Y	Lecture	Written/ Viva voce			
AN50.2	Describe & demonstrate the type, articular ends, ligaments and movements of Intervertebral joints, Sacroiliac joints & Pubic symphysis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN50.3	Describe lumbar puncture (site, direction of the needle, structures pierced during the lumbar puncture)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
AN50.4	Explain the anatomical basis of Scoliosis, Lordosis, Prolapsed disc, Spondylolisthesis & Spina bifida	K	KH	N	Lecture	Written		Orthopedics	
Topic: Sectional Anatomy Number of competencies: (2) Number of procedures for certification: (NIL)									
AN51.1	Describe & identify the cross-section at the level of T8, T10 and L1 (transpyloric plane)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Radiodiagnosis	
AN51.2	Describe & identify the midsagittal section of male and female pelvis	K	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Radiodiagnosis	
Topic: Histology & Embryology Number of competencies: (8) Number of procedures for certification: (NIL)									
AN52.1	Describe & identify the microanatomical features of Gastro-intestinal system: Oesophagus, Fundus of stomach, Pylorus of stomach, Duodenum, Jejunum, Ileum, Large intestine, Appendix, Liver, Gall bladder, Pancreas & Suprarenal gland	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN52.2	Describe & identify the microanatomical features of: Urinary system: Kidney, Ureter & Urinary bladder Male Reproductive System: Testis, Epididymis, Vas deferens, Prostate & penis Female reproductive system: Ovary, Uterus, Uterine tube, Cervix, Placenta & Umbilical cord	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN52.3	Describe & identify the microanatomical features of Cardiooesophageal junction, Corpus luteum	K/S	SH	N	Lecture, Practical	Written/ skill assessment			
AN52.4	Describe the development of anterior abdominal wall	K	KH	N	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN52.5	Describe the development and congenital anomalies of Diaphragm	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.6	Describe the development and congenital anomalies of: Foregut, Midgut & Hindgut	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.7	Describe the development of Urinary system	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.8	Describe the development of male & female reproductive system	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
Topic: Osteology Number of competencies: (4) Number of procedures for certification: (NIL)									
AN53.1	Identify & hold the bone in the anatomical position, Describe the salient features, articulations & demonstrate the attachments of muscle groups	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		General Surgery, Obstetrics & Gynaecology	
AN53.2	Demonstrate the anatomical position of bony pelvis & show boundaries of pelvic inlet, pelvic cavity, pelvic outlet	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.3	Define true pelvis and false pelvis and demonstrate sex determination in male & female bony pelvis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.4	Explain and demonstrate clinical importance of bones of abdominopelvic region (sacralization of lumbar vertebra, Lumbarization of 1st sacral vertebra, types of bony pelvis & Coccyx)	K/S	SH	N	Lecture, DOAP session	Viva voce/ skill assessment			
Topic: Radiodiagnosis Number of competencies: (3) Number of procedures for certification: (NIL)									
AN54.1	Describe & identify features of plain X ray abdomen	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	
AN54.2	Describe & identify the special radiographs of abdominopelvic region (contrast X ray Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography & Hysterosalpingography)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN54.3	Describe role of ERCP, CT abdomen, MRI, Arteriography in radiodiagnosis of abdomen	K	KH	N	Lecture	Viva voce		Radiodiagnosis	
Topic: Surface marking Number of competencies: (2) Number of procedures for certification: (NIL)									
AN55.1	Demonstrate the surface marking of; Regions and planes of abdomen, Superficial inguinal ring, Deep inguinal ring , McBurney's point, Renal Angle & Murphy's point	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Surgery	
AN55.2	Demonstrate the surface projections of: Stomach, Liver, Fundus of gall bladder, Spleen, Duodenum, Pancreas, Ileocaecal junction, Kidneys & Root of mesentery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Surgery	
Topic: Meninges & CSF Number of competencies: (2) Number of procedures for certification: (NIL)									
AN56.1	Describe & identify various layers of meninges with its extent & modifications	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
Topic: Spinal Cord Number of competencies: (5) Number of procedures for certification: (NIL)									
AN57.1	Identify external features of spinal cord	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN57.2	Describe extent of spinal cord in child & adult with its clinical implication	K	KH	Y	Lecture	Written/ Viva voce			
AN57.3	Draw & label transverse section of spinal cord at mid-cervical & mid-thoracic level	K	KH	Y	Lecture	Written/ Viva voce			
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Medulla Oblongata Number of competencies: (4) Number of procedures for certification: (NIL)									
AN58.1	Identify external features of medulla oblongata	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			
AN58.2	Describe transverse section of medulla oblongata at the level of 1) pyramidal decussation, 2) sensory decussation 3) ION	K	KH	Y	Lecture	Written/ Viva voce			
AN58.3	Enumerate cranial nerve nuclei in medulla oblongata with their functional group	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Pons Number of competencies: (3) Number of procedures for certification: (NIL)									
AN59.1	Identify external features of pons	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN59.2	Draw & label transverse section of pons at the upper and lower level	K	KH	Y	Lecture	Written/ Viva voce			
AN59.3	Enumerate cranial nerve nuclei in pons with their functional group	K	KH	Y	Lecture	Written/ Viva voce			
Topic: Cerebellum Number of competencies: (3) Number of procedures for certification: (NIL)									
AN60.1	Describe & demonstrate external & internal features of cerebellum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN60.2	Describe connections of cerebellar cortex and intracerebellar nuclei	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Midbrain Number of competencies: (3) Number of procedures for certification: (NIL)									
AN61.1	Identify external & internal features of midbrain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN61.2	Describe internal features of midbrain at the level of superior & inferior colliculus	K	KH	Y	Lecture	Written/ Viva voce			
AN61.3	Describe anatomical basis & effects of Benedikt's and Weber's syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Cranial nerve nuclei & Cerebral hemispheres Number of competencies: (6) Number of procedures for certification: (NIL)									
AN62.1	Enumerate cranial nerve nuclei with its functional component	K	KH	Y	Lecture	Written/ Viva voce			
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.4	Enumerate parts & major connections of basal ganglia & limbic lobe	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Ventricular System Number of competencies: (2) Number of procedures for certification: (NIL)									
AN63.1	Describe & demonstrate parts, boundaries & features of IIIrd, IVth & lateral ventricle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	Lecture	Written		Pediatrics	Physiology
Topic: Histology & Embryology Number of competencies: (3) Number of procedures for certification: (NIL)									
AN64.1	Describe & identify the microanatomical features of Spinal cord, Cerebellum & Cerebrum	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN64.2	Describe the development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere & cerebellum	K	KH	Y	Lecture	Written/ Viva voce			
AN64.3	Describe various types of open neural tube defects with its embryological basis	K	KH	N	Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
Topic: Epithelium histology Number of competencies: (2) Number of competencies for certification: (01)									
AN65.1	Identify epithelium under the microscope & describe the various types that correlate to its function	K/S	P	Y	Lecture, Practical	Written/ skill assessment	1		
AN65.2	Describe the ultrastructure of epithelium	K	KH	N	Lecture, Practical	Written			
Topic: Connective tissue histology Number of competencies: (2) Number of procedures for certification: (NIL)									
AN66.1	Describe & identify various types of connective tissue with functional correlation	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			Physiology
AN66.2	Describe the ultrastructure of connective tissue	K	KH	N	Lecture, Practical	Written		Pathology	
Topic: Muscle histology Number of competencies: (3) Number of procedures for certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN67.1	Describe & identify various types of muscle under the microscope	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN67.2	Classify muscle and describe the structure-function correlation of the same	K	KH	Y	Lecture, Practical	Written			Physiology
AN67.3	Describe the ultrastructure of muscular tissue	K	KH	N	Lecture, Practical	Written			
Topic: Nervous tissue histology Number of competencies: (3) Number of procedures for certification: (NIL)									
AN68.1	Describe & Identify multipolar & unipolar neuron, ganglia, peripheral nerve	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN68.2	Describe the structure-function correlation of neuron	K	KH	Y	Lecture, Practical	Written			Physiology
AN68.3	Describe the ultrastructure of nervous tissue	K	KH	N	Lecture, Practical	Written			
Topic: Blood Vessels Number of competencies: (3) Number of procedures for certification: (NIL)									
AN69.1	Identify elastic & muscular blood vessels, capillaries under the microscope	K/S	SH	Y	Lecture, Practical	Skill assessment			
AN69.2	Describe the various types and structure-function correlation of blood vessel	K	KH	Y	Lecture, Practical	Written			Physiology
AN69.3	Describe the ultrastructure of blood vessels	K	KH	Y	Lecture, Practical	Written			
Topic: Glands & Lymphoid tissue Number of competencies: (2) Number of procedures for certification: (NIL)									
AN70.1	Identify exocrine gland under the microscope & distinguish between serous, mucous and mixed acini	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph node, spleen, thymus, tonsil and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Topic: Bone & Cartilage Number of competencies: (2) Number of procedures for certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN71.1	Identify bone under the microscope; classify various types and describe the structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN71.2	Identify cartilage under the microscope & describe various types and structure- function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Topic: Integumentary System Number of competencies: (1) Number of procedures for certification: (NIL)									
AN72.1	Identify the skin and its appendages under the microscope and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
Topic: Chromosomes Number of competencies: (3) Number of procedures for certification: (NIL)									
AN73.1	Describe the structure of chromosomes with classification	K	KH	Y	Lecture	Written			
AN73.2	Describe technique of karyotyping with its applications	K	KH	Y	Lecture	Written			
AN73.3	Describe the Lyon's hypothesis	K	KH	Y	Lecture	Written			
Topic: Patterns of Inheritance Number of competencies: (4) Number of procedures for certification: (NIL)									
AN74.1	Describe the various modes of inheritance with examples	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.2	Draw pedigree charts for the various types of inheritance & give examples of diseases of each mode of inheritance	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.3	Describe multifactorial inheritance with examples	K	KH	Y	Lecture	Written		General Medicine	
AN74.4	Describe the genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & Sickle cell anaemia	K	KH	N	Lecture	Written		General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Principle of Genetics, Chromosomal Aberrations & Clinical Genetics Number of competencies: (5) Number of procedures for certification: (NIL)									
AN75.1	Describe the structural and numerical chromosomal aberrations	K	KH	Y	Lecture	Written		Pediatrics	
AN75.2	Explain the terms mosaics and chimeras with example	K	KH	N	Lecture	Written		Pediatrics	
AN75.3	Describe the genetic basis & clinical features of Prader Willi syndrome, Edward syndrome & Patau syndrome	K	KH	N	Lecture	Written		Pediatrics	
AN75.4	Describe genetic basis of variation: polymorphism and mutation	K	KH	Y	Lecture	Written		Pediatrics	
AN75.5	Describe the principles of genetic counselling	K	KH	Y	Lecture	Written		Pediatrics, Obstetrics & Gynaecology	
Topic: Introduction to embryology Number of competencies: (2) Number of procedures for certification: (NIL)									
AN76.1	Describe the stages of human life	K	KH	Y	Lecture	Written			
AN76.2	Explain the terms- phylogeny, ontogeny, trimester, viability	K	KH	Y	Lecture	written			
Topic: Gametogenesis and fertilization Number of competencies: (6) Number of procedures for certification: (NIL)									
AN77.1	Describe the uterine changes occurring during the menstrual cycle	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.2	Describe the synchrony between the ovarian and menstrual cycles	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.3	Describe spermatogenesis and oogenesis along with diagrams	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.4	Describe the stages and consequences of fertilisation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN77.5	Enumerate and describe the anatomical principles underlying contraception	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.6	Describe teratogenic influences; fertility and sterility, surrogate motherhood, social significance of “sex-ratio”.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: Second week of development Number of competencies: (5) Number of procedures for certification: (NIL)									
AN78.1	Describe cleavage and formation of blastocyst	K	KH	Y	Lecture	Written			
AN78.2	Describe the development of trophoblast	K	KH	Y	Lecture	Written			
AN78.3	Describe the process of implantation & common abnormal sites of implantation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN78.4	Describe the formation of extra-embryonic mesoderm and coelom, bilaminar disc and prochordal plate	K	KH	Y	Lecture	Written			
AN78.5	Describe in brief abortion; decidual reaction, pregnancy test	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Toic: 3rd to 8th week of development Number of competencies: (6) Number of procedures for certification: (NIL)									
AN79.1	Describe the formation & fate of the primitive streak	K	KH	Y	Lecture	Written			
AN79.2	Describe formation & fate of notochord	K	KH	Y	Lecture	Written			
AN79.3	Describe the process of neurulation	K	KH	Y	Lecture	Written			
AN79.4	Describe the development of somites and intra-embryonic coelom	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN79.5	Explain embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN79.6	Describe the diagnosis of pregnancy in first trimester and role of teratogens, alpha-fetoprotein	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Fetal membranes Number of competencies: (7) Number of procedures for certification: (NIL)									
AN80.1	Describe formation, functions & fate of-chorion: amnion; yolk sac; allantois & decidua	K	KH	Y	Lecture	Written			
AN80.2	Describe formation & structure of umbilical cord	K	KH	Y	Lecture	Written			
AN80.3	Describe formation of placenta, its physiological functions, foetomaternal circulation & placental barrier	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.4	Describe embryological basis of twinning in monozygotic & dizygotic twins	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.5	Describe role of placental hormones in uterine growth & parturition	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.6	Explain embryological basis of estimation of fetal age.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN80.7	Describe various types of umbilical cord attachments	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: Prenatal Diagnosis Number of competencies: (3) Number of procedures for certification: (NIL)									
AN81.1	Describe various methods of prenatal diagnosis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.2	Describe indications, process and disadvantages of amniocentesis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.3	Describe indications, process and disadvantages of chorion villus biopsy	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Topic: Ethics in Anatomy Number of competencies: (1) Number of procedures for certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN 82.1	Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue	S	SH	Y	Group Activity	NIL		AETCOM	
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform. Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation								
Integration									
Physiology									
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.7	Describe the different types of muscle fibres and their structure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY4.1	Describe the structure and functions of digestive system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.1	Describe the functional Anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY9.1	Describe and discuss sex determination; sex differentiation and their abnormalities and outline psychiatry and practical implication of sex determination.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.1	Describe and discuss the organization of nervous system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.3	Describe and discuss somatic sensations & sensory tracts	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.4	Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, Sensory system, motor system, reflexes, Cranial Nerves in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment / Viva voce / OSCE	1 each (total 5)		Human Anatomy
Biochemistry									
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
Pathology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	K	KH	Y	Lecture, Small group	Written/ Viva voce		Human Anatomy, General Surgery	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy Physiology, General Medicine, General Surgery	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopedics	Microbiology
Forensic Medicine & Toxicology									
FM2.28	Describe and discuss signs of intrauterine death, signs of live birth, viability of foetus, age determination of foetus, DOAP session of ossification centres, Hydrostatic test, Sudden infants death syndrome and Munchausen's syndrome by proxy.	K	KH	Y	Lectures, Small group discussion, Autopsy, DOAP session	Written/Viva voce/ OSCE		Pediatrics, Human Anatomy	
FM3.1	Identification Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones ossification centres, medico-legal aspects of age.	K	KH	Y	Lectures, Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce/skill assessment		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Anesthesiology									
AS4.2	Describe the Anatomy of the airway and its implications for general anaesthesia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.2	Describe the correlative Anatomy of the brachial plexus, subarachnoid and epidural spaces	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.3	Observe and describe the principles and steps/ techniques involved in peripheral nerve blocks	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy	
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy Physiology	
ENT									
EN1.1	Describe the Human Anatomy & physiology of ear, nose, throat, head & neck.	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/Skill assessment		Human Anatomy	
Ophthalmology									
OP2.1	Enumerate the causes, describe and discuss the aetiology, clinical presentations and diagnostic features of common conditions of the lid and adnexa including Hordeolum externum/ internum, blepharitis, preseptal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagophthalmos	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP4.1	Enumerate describe and discuss the types and causes of corneal ulceration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP6.7	Enumerate and discuss the aetiology, the clinical distinguishing features of various glaucomas associated with shallow and deep anterior chamber. Choose appropriate investigations and treatment for patients with above conditions.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Human Anatomy	
OP8.1	Discuss the aetiology, pathology, clinical features and management of vascular occlusions of the retina	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Pathology	
Dentistry									
DE1.1	Enumerate the parts of the tooth	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	
DE5.1	Enumerate the parts of the tooth and supporting structures	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	
General Medicine									
IM3.1	Define discuss describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture, Small Group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM13.9	Demonstrate in a mannequin the correct technique for performing breast exam, rectal examination and cervical examination and pap smear	S	K	Y	Bedside clinic	Skill assessment/ short case		Human Anatomy	General Surgery
IM17.1	Define and classify headache and describe the presenting features, precipitating factors, aggravating and relieving factors of various kinds of headache	K	KH	Y	Lecture, Small group discussion	short note/ Viva voce		Human Anatomy	
IM18.1	Describe the functional and the vascular anatomy of the brain	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Human Anatomy	
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Human Anatomy, Physiology	
Obstetrics & Gynaecology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OG2.1	Describe and discuss the development and anatomy of the female reproductive tract, relationship to other pelvic organs, applied anatomy as related to Obstetrics and Gynaecology.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Human Anatomy	
OG4.1	Describe and discuss the basic embryology of fetus , factors influencing fetal growth and development, anatomy and physiology of placenta, and teratogenesis	K	K	Y	Lecture, Small group discussion	Theory		Human Anatomy	
OG14.1	Enumerate and discuss the diameters of maternal pelvis and types	K	KH	Y	Lecture, Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce/ skill assessment		Human Anatomy	
General Surgery									
SU19.1	Describe the etiology and classification of cleft lip and palate	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU19.2	Describe the Principles of reconstruction of cleft lip and palate	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU22.1	Describe the Applied anatomy, and physiology of thyroid	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU22.5	Describe the applied anatomy of parathyroid.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU23.1	Describe the applied anatomy of adrenal glands	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU24.1	Describe the clinical features, principles of investigation, prognosis and management of pancreatitis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
SU25.1	Describe applied anatomy appropriate investigations for breast disease	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.2	Describe the clinical features, investigations and principles of management of congenital anomalies of Genitourinary system.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.5	Describe the applied anatomy and physiology of esophagus	K	K	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Human Anatomy, Physiology	
SU28.7	Describe the applied anatomy and physiology of stomach.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.10	Describe the applied anatomy of liver. Describe the Clinical features, Investigations and principles of management of Liver abscess, hydatid disease, Injuries and Tumors of the liver.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.11	Describe the applied anatomy of Spleen. Describe the clinical features, Investigations and principles of management of splenic injuries. Describe the Post-splenectomy sepsis- prophylaxis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.12	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.13	Describe the applied anatomy of small and large intestines	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.16	Describe applied anatomy including congenital anomalies of the rectum and anal canal	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
SU30.2	Describe the applied anatomy, clinical features, investigations and principles of management of Undescended testis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.3	Describe the applied anatomy, clinical features, investigations and principles of management of Epididymo-orchitis	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.4	Describe the applied anatomy, clinical features, investigations and principles of management of Varicocele	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.5	Describe the applied anatomy, clinical features, investigations and principles of management of Hydrocele	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
Orthopaedics									
OR2.1	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fracture of clavicle	K/S	KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE	1	Human Anatomy	
OR2.2	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fractures of proximal humerus	K	K/KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.3	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of supra condylar fracture of humerus	K	KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.4	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of fracture of shaft of humerus and intercondylar fracture humerus with emphasis on neurovascular deficit	K/S	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.5	Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of both bones forearm and Galeazzi and Monteggia injury	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OR2.6	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.7	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of pelvic injuries with emphasis on hemodynamic instability	K	K/KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.8	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasis on mobilisation of the patient	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.9	Describe and discuss the mechanism of injury, Clinical features, investigations and principle of management of acetabular fracture	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.10	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur	K/S/A/C	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.11	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) Fracture patella (b) Fracture distal femur © Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.12	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.13	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of: (a) Fracture both bones leg (b) Calcaneus (c) Small bones of foot	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.14	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of ankle fractures	K/S/C	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OR2.15	Plan and interpret the investigations to diagnose complications of fractures like malunion, non-union, infection, compartmental syndrome	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE	2	Human Anatomy	
OR2.16	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection, prevention and management	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR11.1	Describe and discuss the aetiopathogenesis, Clinical features, Investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves	K	K/H	Y	Lecture, Small Group discussion, case discussion	Written/ Viva voce/ OSCE		Human Anatomy	General Medicine, General surgery
OR12.1	Describe and discuss the Clinical features, Investigations and principles of management of Congenital and acquired malformations and deformities of: a. limbs and spine - Scoliosis and spinal bifida b. Congenital dislocation of Hip, Torticollis, c. congenital talipes equino varus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE		Human Anatomy	
Physical Medicine & Rehabilitation									
PM2.1	Describe the causes of disability in the patient with a cerebrovascular accident	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	General Medicine
PM3.1	Describe and discuss the clinical features, types, evaluation, diagnosis and management of cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	Pediatrics
Pediatrics									
PE32.1	Discuss the genetic basis, risk factors, complications, prenatal diagnosis, management and genetic counselling in Down's Syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

PHYSIOLOGY (CODE: PY)

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PHYSIOLOGY									
Topic: General Physiology Number of competencies: (09) Number of procedures that require certification : (NIL)									
PY1.1	Describe the structure and functions of a mammalian cell	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.2	Describe and discuss the principles of homeostasis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.3	Describe intercellular communication	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.4	Describe apoptosis – programmed cell death	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY1.5	Describe and discuss transport mechanisms across cell membranes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.6	Describe the fluid compartments of the body, its ionic composition & measurements	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY1.7	Describe the concept of pH & Buffer systems in the body	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY1.8	Describe and discuss the molecular basis of resting membrane potential and action potential in excitable tissue	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.9	Demonstrate the ability to describe and discuss the methods used to demonstrate the functions of the cells and its products, its communications and their applications in Clinical care and research.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Haematology Number of competencies: (13) Number of procedures that require certification: (NIL)									

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY2.1	Describe the composition and functions of blood components	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.2	Discuss the origin, forms, variations and functions of plasma proteins	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.3	Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.4	Describe RBC formation (erythropoiesis & its regulation) and its functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.5	Describe different types of anaemias & Jaundice	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	Biochemistry
PY2.6	Describe WBC formation (granulopoiesis) and its regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.7	Describe the formation of platelets, functions and variations.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.8	Describe the physiological basis of hemostasis and, anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY2.9	Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	K	KH	Y	Lecture, Small group discussion, ECE- Visit to blood bank	Written/Viva voce		Pathology	
PY2.10	Define and classify different types of immunity. Describe the development of immunity and its regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.11	Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce		Pathology	
PY2.12	Describe test for ESR, Osmotic fragility, Hematocrit. Note the findings and interpret the test results etc	K	KH	Y	Demonstration	Written /Viva voce		Pathology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY2.13	Describe steps for reticulocyte and platelet count	K	KH	Y	Demonstration sessions	Written /Viva voce		Pathology	
Topic: Nerve and Muscle Physiology Number of competencies: (18) Number of procedures that require certification: (NIL)									
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.2	Describe the types, functions & properties of nerve fibers	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.3	Describe the degeneration and regeneration in peripheral nerves	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY3.4	Describe the structure of neuro-muscular junction and transmission of impulses	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Anaesthesiology	
PY3.5	Discuss the action of neuro-muscular blocking agents	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Anaesthesiology, Pharmacology	
PY3.6	Describe the pathophysiology of Myasthenia gravis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY3.7	Describe the different types of muscle fibres and their structure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.8	Describe action potential and its properties in different muscle types (skeletal & smooth)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.9	Describe the molecular basis of muscle contraction in skeletal and in smooth muscles	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.10	Describe the mode of muscle contraction (isometric and isotonic)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.11	Explain energy source and muscle metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY3.12	Explain the gradation of muscular activity	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY3.14	Perform Ergography	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce			
PY3.15	Demonstrate effect of mild, moderate and severe exercise and record changes in cardiorespiratory parameters	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce			
PY3.16	Demonstrate Harvard Step test and describe the impact on induced physiologic parameters in a simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce			
PY3.17	Describe Strength-duration curve	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.18	Observe with Computer assisted learning (i) amphibian nerve - muscle experiments (ii) amphibian cardiac experiments	S	KH	Y	Demonstration, Computer assisted learning methods	Practical / Viva voce			
Topic: Gastro-intestinal Physiology Number of competencies: (10) Number of procedures that require certification: (NIL)									
PY4.1	Describe the structure and functions of digestive system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.3	Describe GIT movements, regulation and functions. Describe defecation reflex. Explain role of dietary fibre.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.4	Describe the physiology of digestion and absorption of nutrients	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY4.5	Describe the source of GIT hormones, their regulation and functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.6	Describe the Gut-Brain Axis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.7	Describe & discuss the structure and functions of liver and gall bladder	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	K	KH	Y	Lecture, Small group discussion, Demonstration Esophageal Manometry & endoscopy	Written/Viva voce			Biochemistry
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro-oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Biochemistry
PY4.10	Demonstrate the correct clinical examination of the abdomen in a normal volunteer or simulated environment	S	SH	Y	DOAP session	Skill assessment/ Viva voce/OSCE			
Topic: Cardiovascular Physiology (CVS) Number of competencies: (16) Number of procedures that require certification: (03)									
PY5.1	Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.2	Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.3	Discuss the events occurring during the cardiac cycle	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.4	Describe generation, conduction of cardiac impulse	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.5	Describe the physiology of electrocardiogram (E.C.G), its applications and the cardiac axis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY5.6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY5.7	Describe and discuss haemodynamics of circulatory system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.8	Describe and discuss local and systemic cardiovascular regulatory mechanisms	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.9	Describe the factors affecting heart rate, regulation of cardiac output & blood pressure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.10	Describe & discuss regional circulation including microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, foetal, pulmonary and splanchnic circulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY5.11	Describe the patho-physiology of shock, syncope and heart failure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.12	Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce	1 each x 3		
PY5.13	Record and interpret normal ECG in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce		General Medicine	
PY5.14	Observe cardiovascular autonomic function tests in a volunteer or simulated environment	S	SH	N	DOAP sessions	Skill assessment/ Viva voce			
PY5.15	Demonstrate the correct clinical examination of the cardiovascular system in a normal volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce			
PY5.16	Record Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment	S	SH	N	DOAP sessions, Computer assisted learning methods	Practical/OSPE/ Viva voce		General Medicine	
Topic: Respiratory Physiology Number of competencies: (10) Number of procedures that require certification: (01)									

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY6.1	Describe the functional anatomy of respiratory tract	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.2	Describe the mechanics of normal respiration, pressure changes during ventilation, lung volume and capacities, alveolar surface tension, compliance, airway resistance, ventilation, V/P ratio, diffusion capacity of lungs	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.3	Describe and discuss the transport of respiratory gases: Oxygen and Carbon dioxide	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.4	Describe and discuss the physiology of high altitude and deep sea diving	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.5	Describe and discuss the principles of artificial respiration, oxygen therapy, acclimatization and decompression sickness.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.6	Describe and discuss the pathophysiology of dyspnoea, hypoxia, cyanosis asphyxia; drowning, periodic breathing	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.7	Describe and discuss lung function tests & their clinical significance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.8	Demonstrate the correct technique to perform & interpret Spirometry	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce		Respiratory Medicine	
PY6.9	Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce/OSCE	1		
PY6.10	Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce			
Topic: Renal Physiology Number of competencies: (09) Number of procedures that require certification: (NIL)									
PY7.1	Describe structure and function of kidney	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.2	Describe the structure and functions of juxta glomerular apparatus and role of renin-angiotensin system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY7.3	Describe the mechanism of urine formation involving processes of filtration, tubular reabsorption & secretion; concentration and diluting mechanism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.4	Describe & discuss the significance & implication of Renal clearance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.5	Describe the renal regulation of fluid and electrolytes & acid-base balance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.6	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.7	Describe artificial kidney, dialysis and renal transplantation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY7.8	Describe & discuss Renal Function Tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY7.9	Describe cystometry and discuss the normal cystometrogram	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Endocrine Physiology Number of competencies: (06) Number of procedures that require certification : (NIL)									
PY8.1	Describe the physiology of bone and calcium metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.2	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.3	Describe the physiology of Thymus & Pineal Gland	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY8.5	Describe the metabolic and endocrine consequences of obesity & metabolic syndrome, Stress response. Outline the psychiatry component pertaining to metabolic syndrome.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.6	Describe & differentiate the mechanism of action of steroid, protein and amine hormones	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Reproductive Physiology Number of competencies: (12) Number of procedures that require certification: (NIL)									
PY9.1	Describe and discuss sex determination; sex differentiation and their abnormalities and outline psychiatry and practical implication of sex determination.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY9.2	Describe and discuss puberty: onset, progression, stages; early and delayed puberty and outline adolescent clinical and psychological association.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.3	Describe male reproductive system: functions of testis and control of spermatogenesis & factors modifying it and outline its association with psychiatric illness	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.4	Describe female reproductive system: (a) functions of ovary and its control; (b) menstrual cycle - hormonal, uterine and ovarian changes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.5	Describe and discuss the physiological effects of sex hormones	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology, Community Medicine	
PY9.7	Describe and discuss the effects of removal of gonads on physiological functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY9.8	Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.9	Interpret a normal semen analysis report including (a) sperm count, (b) sperm morphology and (c) sperm motility, as per WHO guidelines and discuss the results	K	KH	Y	Lecture, Small group discussion	OSPE/Viva voce			
PY9.10	Discuss the physiological basis of various pregnancy tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.11	Discuss the hormonal changes and their effects during perimenopause and menopause	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.12	Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
Topic: Neurophysiology Number of competencies: (20) Number of procedures that require certification: (09)									
PY10.1	Describe and discuss the organization of nervous system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.3	Describe and discuss somatic sensations & sensory tracts	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.4	Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.8	Describe and discuss behavioural and EEG characteristics during sleep and mechanism responsible for its production	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.9	Describe and discuss the physiological basis of memory, learning and speech	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.10	Describe and discuss chemical transmission in the nervous system. (Outline the psychiatry element).	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, sensory system, motor system, reflexes, cranial nerves in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce/OSCE	1 each (total 5)		Human Anatomy
PY10.12	Identify normal EEG forms	S	S	Y	Small group teaching	OSPE/Viva voce		Psychiatry	
PY10.13	Describe and discuss perception of smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.14	Describe and discuss patho-physiology of altered smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.15	Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.16	Describe and discuss pathophysiology of deafness. Describe hearing tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.17	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, refractive errors, colour blindness, physiology of pupil and light reflex	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY10.18	Describe and discuss the physiological basis of lesion in visual pathway	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.19	Describe and discuss auditory & visual evoke potentials	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.20	Demonstrate (i) Testing of visual acuity, colour and field of vision and (ii) hearing (iii) Testing for smell and (iv) taste sensation in volunteer/ simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce	1 each (total 4)	ENT, Ophthalmology	
Topic: Integrated Physiology Number of competencies: (14) Number of procedures that require certification: (NIL)									
PY11.1	Describe and discuss mechanism of temperature regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.2	Describe and discuss adaptation to altered temperature (heat and cold)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.3	Describe and discuss mechanism of fever, cold injuries and heat stroke	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.4	Describe and discuss cardio-respiratory and metabolic adjustments during exercise; physical training effects	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.5	Describe and discuss physiological consequences of sedentary lifestyle	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.6	Describe physiology of Infancy	K	KH	N	Lecture, Small group discussion	Written/Viva voce		Pediatrics	
PY11.7	Describe and discuss physiology of aging; free radicals and antioxidants	K	KH	N	Lecture, Small group discussion	Written/Viva voce			
PY11.8	Discuss & compare cardio-respiratory changes in exercise (isometric and isotonic) with that in the resting state and under different environmental conditions (heat and cold)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY11.9	Interpret growth charts	K	KH	N	Small group teaching	Practical/OSPE/ Viva voce		Pediatrics	
PY11.10	Interpret anthropometric assessment of infants	K	KH	N	Small group teaching	Practical/OSPE/ Viva voce		Pediatrics	
PY11.11	Discuss the concept, criteria for diagnosis of Brain death and its implications	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.12	Discuss the physiological effects of meditation	K	KH	N	Lecture, Small group discussion	Written/Viva voce			
PY11.13	Obtain history and perform general examination in the volunteer / simulated environment	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce			
PY11.14	Demonstrate Basic Life Support in a simulated environment	S	SH	Y	DOAP sessions	OSCE		General Medicine, Anaesthesiology	

Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication.
Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

Human Anatomy									
AN3.1	Classify muscle tissue according to structure & action	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.1	Differentiate between blood vascular and lymphatic system	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.2	Differentiate between pulmonary and systemic circulation	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN5.7	Explain function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses	K	KH	N	Lecture	Written			Physiology
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN7.2	List components of nervous tissue and their functions	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.3	Describe parts of a neuron and classify them based on number of neurites, size & function	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.7	Describe various types of synapse	K	KH	N	Lecture	Written			Physiology
AN21.9	Describe & demonstrate mechanics and types of respiration	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.2	Describe & demonstrate external and internal features of each chamber of heart	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.3	Describe & demonstrate origin, course and branches of coronary arteries	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.4	Describe anatomical basis of ischaemic heart disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.9	Demonstrate surface marking of lines of pleural reflection, Lung borders and fissures, Trachea, Heart borders, Apex beat & Surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General Medicine	Physiology
AN58.3	Enumerate cranial nerve nuclei in medulla oblongata with their functional group	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
AN59.1	Identify external features of pons	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
AN61.3	Describe anatomical basis & effects of Benedikt's and Weber's syndromme	K	KH	N	Lecture	Written		General Medicine	Physiology
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.4	Enumerate parts & major connections of basal ganglia & limbic lobe	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN63.1	Describe & demonstrate parts, boundaries & features of IIIrd, IVth & lateral ventricle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	Lecture	Written		Pediatrics	Physiology
AN66.1	Describe & identify various types of connective tissue with functional correlation	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			Physiology
AN67.2	Classify muscle and describe the structure-function correlation of the same	K	KH	Y	Lecture, Practical	Written			Physiology
AN68.2	Describe the structure-function correlation of neuron	K	KH	Y	Lecture, Practical	Written			Physiology
AN69.2	Describe the various types and structure-function correlation of blood vessel	K	KH	Y	Lecture, Practical	Written			Physiology
Biochemistry									
BI1.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	K	KH	Y	Lecture, Small group discussions	Written assessment and Viva voce			Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Physiology
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.3	Describe the common disorders associated with nucleotide metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physiology
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	Physiology
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	DOAP session	Skill assessment	1	General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Pathology									
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA27.3	Describe the etiology, types, stages pathophysiology pathology and complications of heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	S	SH	Y	DOAP session	Skill Assessment		Physiology, General Medicine	
PA27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	

Pharmacology

PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology, Physiology	
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, antipsychotic, antidepressant drugs, anti-manics, opioid agonists and antagonists, drugs used for neurodegenerative disorders, antiepileptics Drugs)	K	KH	Y	Lecture	Written/ Viva voce		Psychiatry, Physiology	
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin angiotensin and aldosterone system	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1. Drugs used in anemias 2. Colony Stimulating factors	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Physiology	Pharmacology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Forensic Medicine & Toxicology									
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin.	S	KH	Y	Small group discussion, Lecture	Log book/ skill station/ Viva voce		Pathology, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & Rh blood group of a person.	S	SH	Y	Small group discussion, DOAP session	Log book/ skill station/ Viva voce		Pathology, Physiology	
Anesthesiology									
AS7.3	Observe and describe the management of an unconscious patient	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS7.4	Observe and describe the basic setup process of a ventilator	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy, Physiology	
AS8.2	Elicit and determine the level, quality and quantity of pain and its tolerance in patient or surrogate	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	
Ophtalmology									
OP1.1	Describe the physiology of vision.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	
General Medicine									
IM1.1	Describe and discuss the epidemiology, pathogenesis clinical evolution and course of common causes of heart disease including: rheumatic/ valvular, ischemic, hypertrophic inflammatory.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM1.2	Describe and discuss the genetic basis of some forms of heart failure	K	KH	N	Lecture, Small group discussion	Written		Pathology, Physiology	
IM1.3	Describe and discuss the aetiology microbiology pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.4	Stage heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.5	Describe discuss and differentiate the processes involved in R Vs L heart failure, systolic vs diastolic failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.6	Describe and discuss the compensatory mechanisms involved in heart failure including cardiac remodelling and neurohormonal adaptations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.7	Enumerate, describe and discuss the factors that exacerbate heart failure including ischemia, arrhythmias anemia, thyrotoxicosis, dietary factors drugs etc.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.8	Describe and discuss the pathogenesis and development of common arrhythmias involved in heart failure particularly atrial fibrillation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis and ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology Community Medicine	
IM2.2	Discuss the aetiology of risk factors both modifiable and non modifiable of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.4	Discuss and describe the pathogenesis, natural history, evolution and complications of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM5.1	Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia	K	K	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, Physiology	
IM5.2	Describe and discuss the aetiology and pathophysiology of liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.1	Describe and discuss the epidemiology, aetiology and the prevalence of primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.2	Describe and discuss the pathophysiology of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.1	Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.3	Describe and discuss the physiology of the hypothalamopituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	K	K	Y	Lecture, Small group discussion	short notes		Pathology, Physiology	
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussions	short note/ Viva voce		Pathology, Physiology	General Surgery
IM18.6	Distinguish the lesion based on upper vs lower motor neuron, side, site and most probable nature of the lesion	K/S	SH	Y	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.7	Describe the clinical features and distinguish, based on clinical examination, the various disorders of speech	K/S	SH	N	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.8	Describe and distinguish, based on the clinical presentation, the types of bladder dysfunction seen in CNS disease	K	KH	Y	Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Human Anatomy, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM22.1	Enumerate the causes of hypercalcemia and distinguish the features of PTH vs non PTH mediated hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM22.9	Enumerate the causes and describe the clinical and laboratory features of metabolic acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.10	Enumerate the causes of describe the clinical and laboratory features of metabolic alkalosis	K	KH	N	Lecture, small group discussion	Written/ Viva voce		Physiology	
IM22.11	Enumerate the causes and describe the clinical and laboratory features of respiratory acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.12	Enumerate the causes and describe the clinical and laboratory features of respiratory alkalosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.13	Identify the underlying acid based disorder based on an ABG report and clinical situation	S	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
Obstetrics & Gynaecology									
OG3.1	Describe the physiology of ovulation, menstruation, fertilization, implantation and gametogenesis	K	K	Y	Lecture, seminars	Theory		Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG7.1	Describe and discuss the changes in the genital tract, cardiovascular system, respiratory, haematology, renal and gastrointestinal systems in pregnancy	K	KH	Y	Lecture, seminars	Theory		Physiology	
Pediatrics									
PE7.2	Explain the physiology of lactation	K	KH	Y	Lecture, small group discussion	Written/ Viva voce		Physiology	
PE7.3	Describe the composition and types of breast milk and discuss the differences between cow's milk and human milk	K	KH	Y	Lecture, debate	Written/ Viva voce		Physiology	
PE10.1	Define, describe the etio-pathogenesis, classify including WHO classification, clinical features, complication and management of severe Acute Malnourishment and Moderate Acute Malnutrition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Biochemistry	
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bed side clinics, Skill Lab	Skill station		Physiology, Biochemistry	
PE11.1	Describe the common etiology, clinical features and management of Obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE11.2	Discuss the risk approach for obesity and discuss the prevention strategies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	P	Y	Bedside clinics, Skills lab	Document in log book	3	Biochemistry Physiology Pathology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE12.9	Assess patients with Vitamin D deficiency, diagnose, classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.13	Discuss the RDA, dietary sources of Vitamin K and their role in health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis, management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE23.1	Discuss the Hemodynamic changes, clinical presentation, complications and management of Acyanotic Heart Diseases –VSD, ASD and PDA	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.2	Discuss the Hemodynamic changes, clinical presentation, complications and management of Cyanotic Heart Diseases – Fallot's Physiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.3	Discuss the etio-pathogenesis, clinical presentation and management of cardiac failure in infant and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.4	Discuss the etio-pathogenesis, clinical presentation and management of Acute Rheumatic Fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.5	Discuss the clinical features, complications, diagnosis, management and prevention of Acute Rheumatic Fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE29.1	Discuss the etio-pathogenesis, Clinical features, classification and approach to a child with anaemia	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, Physiology	
PE29.2	Discuss the etio-pathogenesis, clinical features and management of Iron Deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE29.3	Discuss the etiopathogenesis, Clinical features and management of VIT B12, Folate deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.4	Discuss the etio-pathogenesis, clinical features and management of Hemolytic anemia, Thalassemia Major, Sickle cell anaemia, Hereditary spherocytosis, Auto-immune hemolytic anaemia and hemolytic uremic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology Physiology	

General Surgery

SU1.1	Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators	K	KH	Y	Lecture, Bed side clinic and Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
SU2.1	Describe Pathophysiology of shock. Types of shock. Principles of resuscitation including fluid replacement and monitoring	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
SU4.1	Elicit, document and present history in a case of Burns and perform physical examination. Describe Pathophysiology of Burns.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	
SU12.1	Enumerate the causes and consequences of malnutrition in the surgical patient.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU12.2	Describe and Discuss the methods of estimation and replacement the Fluid and electrolyte requirements in the surgical patient	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU28.5	Describe the applied Anatomy and physiology of esophagus	K	K	Y	Lecture, Small group Discussion, Demonstration	Written/ Viva voce		Human Anatomy, Physiology	

Respiratory Medicine

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT2.1	Define and classify obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.2	Describe and discuss the epidemiology risk factors and evolution of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.4	Describe and discuss the physiology and pathophysiology of hypoxia and hypercapnea	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.5	Describe and discuss the genetics of alpha 1 antitrypsin deficiency in emphysema	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.11	Describe, discuss and interpret pulmonary function tests	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Physiology, Pathology	

BIOCHEMISTRY (CODE: BI)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BIOCHEMISTRY									
Topic: Basic Biochemistry		Number of competencies: (01)			Number of procedures that require certification: (NIL)				
BI1.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	K	KH	Y	Lecture, Small group discussion	Written assessment/ Viva voce			Physiology
Topic: Enzyme		Number of competencies: (07)			Number of procedures that require certification: (NIL)				
BI2.1	Explain fundamental concepts of enzyme, isoenzyme, alloenzyme, coenzyme & co-factors. Enumerate the main classes of IUBMB nomenclature.	K	KH	Y	Lecture, case discussion	Written assessment/ Viva voce			
BI2.2	Observe the estimation of SGOT & SGPT	K	K	Y	Demonstration	Viva voce			
BI2.3	Describe and explain the basic principles of enzyme activity	K	KH	Y	Lecture, case discussion	Written/ Viva voce			
BI2.4	Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI2.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI2.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions.	K	KH	Y	Lecture, Small group discussion, DOAP sessions	Written/ Viva voce		Pathology, General Medicine	
Topic: Chemistry and Metabolism of Carbohydrates		Number of competencies: (10)			Number of procedures that require certification: (NIL)				
BI3.1	Discuss and differentiate monosaccharides, di-saccharides and polysaccharides giving examples of main carbohydrates as energy fuel, structural element and storage in the human body	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI3.2	Describe the processes involved in digestion and assimilation of carbohydrates and storage.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.3	Describe and discuss the digestion and assimilation of carbohydrates from food.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.4	Define and differentiate the pathways of carbohydrate metabolism, (glycolysis, gluconeogenesis, glycogen metabolism, HMP shunt).	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.5	Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.6	Describe and discuss the concept of TCA cycle as a amphibolic pathway and its regulation.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Physiology
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI3.9	Discuss the mechanism and significance of blood glucose regulation in health and disease.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.10	Interpret the results of blood glucose levels and other laboratory investigations related to disorders of carbohydrate metabolism.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
Topic: Chemistry and Metabolism of Lipids Number of competencies: (07) Number of procedures that require certification: (NIL)									
BI4.1	Describe and discuss main classes of lipids (Essential/non-essential fatty acids, cholesterol and hormonal steroids, triglycerides, major phospholipids and sphingolipids) relevant to human system and their major functions.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI4.2	Describe the processes involved in digestion and absorption of dietary lipids and also the key features of their metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI4.3	Explain the regulation of lipoprotein metabolism & associated disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.4	Describe the structure and functions of lipoproteins, their functions, interrelations & relations with atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.5	Interpret laboratory results of analytes associated with metabolism of lipids	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.6	Describe the therapeutic uses of prostaglandins and inhibitors of eicosanoid synthesis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.7	Interpret laboratory results of analytes associated with metabolism of lipids.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Chemistry and Metabolism of Proteins Number of competencies: (05) Number of procedures that require certification: (NIL)									
BI5.1	Describe and discuss structural organization of proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI5.3	Describe the digestion and absorption of dietary proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI5.4	Describe common disorders associated with protein metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI5.5	Interpret laboratory results of analytes associated with metabolism of proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Metabolism and homeostasis Number of competencies: (15) Number of procedures that require certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI6.1	Discuss the metabolic processes that take place in specific organs in the body in the fed and fasting states.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.2	Describe and discuss the metabolic processes in which nucleotides are involved.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI6.3	Describe the common disorders associated with nucleotide metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physiology
BI6.4	Discuss the laboratory results of analytes associated with gout & Lesch Nyhan syndrome.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.5	Describe the biochemical role of vitamins in the body and explain the manifestations of their deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.6	Describe the biochemical processes involved in generation of energy in cells.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.8	Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.10	Enumerate and describe the disorders associated with mineral metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
Topic: Molecular biology Number of competencies: (07) Number of procedures that require certification: (NIL)									
BI7.1	Describe the structure and functions of DNA and RNA and outline the cell cycle.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.2	Describe the processes involved in replication & repair of DNA and the transcription & translation mechanisms.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.3	Describe gene mutations and basic mechanism of regulation of gene expression.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI7.4	Describe applications of molecular technologies like recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
BI7.5	Describe the role of xenobiotics in disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.6	Describe the anti-oxidant defence systems in the body.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.7	Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Topic: Nutrition Number of competencies: (05) Number of procedures that require certification: (NIL)									
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.3	Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/ obesity.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables.(macro-molecules & its importance)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
Topic: Extracellular Matrix Number of competencies: (03) Number of procedures that require certification: (NIL)									
BI9.1	List the functions and components of the extracellular matrix (ECM).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI9.2	Discuss the involvement of ECM components in health and disease.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI9.3	Describe protein targeting & sorting along with its associated disorders.	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Oncogenesis and immunity Number of competencies: (05) Number of procedures that require certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI10.1	Describe the cancer initiation, promotion oncogenes & oncogene activation. Also focus on p53 & apoptosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	Physiology
BI10.5	Describe antigens and concepts involved in vaccine development.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
Topic: Biochemical Laboratory Tests Number of competencies: (24) Number of procedures that require certification: (05)									
BI11.1	Describe commonly used laboratory apparatus and equipments, good safe laboratory practice and waste disposal.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.2	Describe the preparation of buffers and estimation of pH.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.3	Describe the chemical components of normal urine.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	DOAP session	Skill assessment	1	General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.5	Describe screening of urine for inborn errors & describe the use of paper chromatography	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.6	Describe the principles of colorimetry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.7	Demonstrate the estimation of serum creatinine and creatinine clearance	S	P	Y	Practical	Skills assessment	1		
BI11.8	Demonstrate estimation of serum proteins, albumin and A:G ratio	S	P	Y	Practical	Skills assessment	1		
BI11.9	Demonstrate the estimation of serum total cholesterol and HDL-cholesterol	S	P	Y	Practical	Skills assessment			
BI11.10	Demonstrate the estimation of triglycerides	S	P	Y	Practical	Skills assessment			
BI11.11	Demonstrate estimation of calcium and phosphorous	S	P	Y	Practical	Skills assessment			
BI11.12	Demonstrate the estimation of serum bilirubin	S	P	Y	Practical	Skills assessment			
BI11.13	Demonstrate the estimation of SGOT/ SGPT	S	P	Y	Practical	Skills assessment			
BI11.14	Demonstrate the estimation of alkaline phosphatase	S	P	Y	Practical	Skills assessment			
BI11.15	Describe & discuss the composition of CSF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.16	Observe use of commonly used equipments/techniques in biochemistry laboratory including: •pH meter •Paper chromatography of amino acid •Protein electrophoresis •TLC, PAGE •Electrolyte analysis by ISE •ABG analyzer •ELISA •Immunodiffusion •Autoanalyser •Quality control •DNA isolation from blood/ tissue	S	KH	Y	Demonstration	Skill assessment			
BI11.17	Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus, - dyslipidemia, - myocardial infarction, - renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice, - liver diseases, pancreatitis, disorders of acid- base balance, thyroid disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI11.18	Discuss the principles of spectrophotometry.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.19	Outline the basic principles involved in the functioning of instruments commonly used in a biochemistry laboratory and their applications.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.20	Identify abnormal constituents in urine, interpret the findings and correlate these with pathological states.	S	SH	Y	DOAP sessions	Skill assessment	1		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.21	Demonstrate estimation of glucose, creatinine, urea and total protein in serum.	S	SH	Y	DOAP sessions	Skill assessment	1		
BI11.22	Calculate albumin: globulin (AG) ratio and creatinine clearance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.23	Calculate energy content of different food Items, identify food items with high and low glycemic index and explain the importance of these in the diet	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.24	Enumerate advantages and/or disadvantages of use of unsaturated, saturated and trans fats in food.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform. Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation									
Integration									
Physiology									
PY3.11	Explain energy source and muscle metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.4	Describe the physiology of digestion and absorption of nutrients	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.7	Describe & discuss the structure and functions of liver and gall bladder	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	K	KH	Y	Lecture, Small group discussion, Demonstration Esophageal Manometry & endoscopy	Written/Viva voce			Biochemistry
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro-oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Biochemistry
PY7.8	Describe & discuss Renal Function Tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Pathology

PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Pediatrics	
PA14.1	Describe iron metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.1	Define and classify hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.2	Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.4	Describe the etiology, pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	

Dermatology, Venereology & Leprosy

DR17.1	Enumerate and identify the cutaneous findings in Vitamin A deficiency	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Skill assessment Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.2	Enumerate and describe the various skin changes in Vitamin B complex deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics, Biochemistry	
DR17.3	Enumerate and describe the various changes in Vitamin C deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.4	Enumerate and describe the various changes in Zinc deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	

Ophthalmology

OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Human Anatomy	

General Medicine

IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.12	Choose and interpret a lipid profile and identify the desirable lipid profile in the clinical context	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Biochemistry	
IM2.18	Discuss and describe the indications, formulations, doses, side effects and monitoring for drugs used in the management of dyslipidemia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM11.12	Perform and interpret a capillary blood glucose test	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM11.13	Perform and interpret a urinary ketone estimation with a dipstick	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM13.1	Describe the clinical epidemiology and inherited & modifiable risk factors for common malignancies in India	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Biochemistry	
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	

Pediatrics

PE9.1	Describe the age related nutritional needs of infants, children and adolescents including micronutrients and vitamins	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Community Medicine, Biochemistry	
PE9.3	Explains the Calorific value of common Indian foods	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE10.1	Define Describe the etio-pathogenesis , Classify including WHO classification , clinical features, complication and management of Severe Acute Malnourishment (SAM) and Moderate Acute Malnutrition (MAM)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bed side clinics, Skill Lab	Skill station		Physiology, Biochemistry	
PE11.1	Describe the common etiology, clinical features and management of Obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE12.1	Discuss the (RDA) , dietary sources of Vitamin A and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.2	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin A	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.3	Identify the clinical features of dietary deficiency / excess of Vitamin A	S	SH	Y	Bed side clinics, Small group discussion	Document in log book		Biochemistry	
PE12.4	Diagnose patients with Vitamin A deficiency, Classify and plan management	S	SH	N	Bed side clinics, Skill Station	Document in log book		Biochemistry	
PE12.5	Discuss the Vitamin A prophylaxis program and their recommendations	K	K	Y	Lecture, Small group Discussion	Written/ Viva voce		Biochemistry	
PE12.6	Discuss the RDA, dietary sources of Vitamin D and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry, Physiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE12.9	Assess patients with Vitamin D deficiency, Diagnose, Classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.11	Discuss the RDA, dietary sources of Vitamin E and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.12	Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin E	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.13	Discuss the RDA , dietary sources of Vitamin K and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis , management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.15	Discuss the RDA , dietary sources of Vitamin B and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.16	Describe the causes, clinical features, diagnosis and management of Deficiency of B complex Vitamins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.17	Identify the clinical features of Vitamin B complex deficiency	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry	
PE12.18	Diagnose patients with Vitamin B complex deficiency and plan management	S	SH	Y	Bed side clinics, Skill lab	Document in log book		Biochemistry	
PE12.19	Discuss the RDA, dietary sources of Vitamin C and their role in Health and disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.20	Describe the causes, clinical features, diagnosis and management of Deficiency of Vitamin C (scurvy)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.21	Identify the clinical features Vitamin C deficiency	S	SH	N	Bed side clinics, Skill lab	Document in log book		Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.2	Describe the causes, diagnosis and management of Fe deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis	S	SH	Y	Bed side clinics, Skill Lab	Document in log book		Pathology, Biochemistry	
PE13.4	Interpret hemogram and Iron Panel	S	SH	Y	Bed side clinic, Small group discussion	Skill Assessment		Pathology, Biochemistry	
PE13.7	Discuss the RDA , dietary sources of Iodine and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.8	Describe the causes, clinical features, diagnosis and management of Deficiency of Iodine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.9	Identify the clinical features of Iodine deficiency disorders	S	SH	N	Lecture, Bed side clinic	Written/ Viva voce		Biochemistry	
PE13.10	Discuss the National Goiter control program and their recommendations	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Community Medicine	
PE13.11	Discuss the RDA, dietary sources of Calcium and its role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.12	Describe the causes, clinical features, diagnosis and management of Ca Deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.13	Discuss the RDA , dietary sources of Magnesium and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.14	Describe the causes, clinical features, diagnosis and management of Magnesium Deficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE19.1	Explain the components of the Universal immunization Program and the sub National Immunization Programs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.3	Vaccine description with regards to Classification of vaccines, Strain used, Dose, route, schedule, Risks benefits and side effects, indications and contraindications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, preterm, organ transplants, those who received blood and blood products, splenectomised children, Adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE21.11	Perform and interpret the common analytes in a Urine examination	S	SH	Y	Bed side clinic Labs, Skill lab	Skill assessment		Biochemistry, Pathology	
PE29.16	Discuss the Indications for Hemoglobin electrophoresis and interpret report	K	K	N	Small group discussion	Viva voce		Biochemistry	
PE33.6	Perform and interpret Urine Dip Stick for Sugar	S	P	Y	DOAP session	Skill assessment	3	Biochemistry	

General Surgery

SU1.1	Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.	K	KH	Y	Lecture, Bed side clinic and Small group discussion.	Written/ Viva voce.		Physiology, Biochemistry	
SU1.2	Describe the factors that affect the metabolic response to injury.	K	KH	Y	Lecture, Bed side clinic and Small group discussion.	Written/ Viva voce.		Biochemistry	
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient.	K	KH	Y	Lecture, Small group discussion.	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU12.3	Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications.	K	KH	Y	Lecture, Small group discussion, Bedside clinic discussion	Written/ Viva voce		Biochemistry	

PHARMACOLOGY (CODE: PH)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PHARMACOLOGY									
KNOWLEDGE: Topic: Pharmacology		Number of competencies: (64)			Number of procedures that require certification : (NIL)				
PH1.1	Define and describe the principles of pharmacology and pharmacotherapeutics	K	K	Y	Lecture	Written/ Viva voce			
PH1.2	Describe the basis of Evidence based medicine and Therapeutic drug monitoring	K	KH	Y	Lecture	Written/ Viva voce			
PH1.3	Enumerate and identify drug formulations and drug delivery systems	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
PH1.4	Describe absorption, distribution, metabolism & excretion of drugs	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.5	Describe general principles of mechanism of drug action	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.6	Describe principles of Pharmacovigilance & ADR reporting systems	K	KH	Y	Lecture, Practical	Written/ Viva voce			
PH1.7	Define, identify and describe the management of adverse drug reactions (ADR)	K/S	KH	Y	Lecture, Practical	Written/ Viva voce			
PH1.8	Identify and describe the management of drug interactions	K/S	KH	Y	Lecture, Practical	Written/ Viva voce			
PH1.9	Describe nomenclature of drugs i.e. generic, branded drugs	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
PH1.10	Describe parts of a correct, complete and legible generic prescription. Identify errors in prescription and correct appropriately	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
PH1.11	Describe various routes of drug administration, eg., oral, SC, IV, IM, SL	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.12	Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal dysfunction.	K/S	SH	Y	Lecture, practical	Written/ Viva voce		Pediatrics, General Medicine	
PH1.13	Describe mechanism of action, types, doses, side effects, indications and contraindications of adrenergic and anti-adrenergic drugs	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.14	Describe mechanism of action, types, doses, side effects, indications and contraindications of cholinergic and anticholinergic drugs	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology, Physiology	
PH1.16	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act by modulating autacoids, including: anti-histaminics, 5-HT modulating drugs, NSAIDs, drugs for gout, anti-rheumatic drugs, drugs for migraine	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.17	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of local anesthetics	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology	
PH1.18	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of general anaesthetics, and pre-anesthetic medications	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology	
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, anti-depressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, anti-epileptics drugs)	K	KH	Y	Lecture	Written/ Viva voce		Psychiatry, Physiology	
PH1.20	Describe the effects of acute and chronic ethanol intake	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.21	Describe the symptoms and management of methanol and ethanol poisonings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	Forensic Medicine
PH1.23	Describe the process and mechanism of drug deaddiction	K/S	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
PH1.24	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs affecting renal systems including diuretics, antidiuretics- vasopressin and analogues	K	KH	Y	Lecture	Written/ Viva voce			
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin-angiotensin and aldosterone system	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.28	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.29	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.30	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the antiarrhythmics	K	KH	N	Lecture	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.31	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in the management of dyslipidemias	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Respiratory Medicine	
PH1.33	Describe the mechanism of action, types, doses, side effects, indications and contraindications of the drugs used in cough (antitussives, expectorants/ mucolytics)	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Respiratory Medicine	
PH1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 1. Acid-peptic disease and GERD 2. Antiemetics and prokinetics 3. Antidiarrhoeals 4 .Laxatives 5. Inflammatory Bowel Disease 6. Irritable Bowel Disorders, biliary and pancreatic diseases	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		General Medicine	
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1.Drugs used in anemias 2.Colony Stimulating factors	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Physiology	Pharmacology
PH1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.37	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used as sex hormones, their analogues and anterior Pituitary hormones	K	KH	Y	Lecture	Written/ Viva voce			
PH1.38	Describe the mechanism of action, types, doses, side effects, indications and contraindications of corticosteroids	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.39	Describe mechanism of action, types, doses, side effects, indications and contraindications the drugs used for contraception	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
PH1.40	Describe mechanism of action, types, doses, side effects, indications and contraindications of 1. Drugs used in the treatment of infertility, and 2. Drugs used in erectile dysfunction	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
PH1.41	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of uterine relaxants and stimulants	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
PH1.42	Describe general principles of chemotherapy	K	KH	Y	Lecture	Written/ Viva voce			
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology
PH1.44	Describe the first line antitubercular drugs, their mechanisms of action, side effects and doses.	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	
PH1.45	Describe the drugs used in MDR and XDR Tuberculosis	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	Microbiology
PH1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	Microbiology
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Microbiology
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	K	KH	Y	Lecture	Written/Viva voce			Microbiology
PH1.49	Describe mechanism of action, classes, side effects, indications and contraindications of anticancer drugs	K	KH	Y	Lecture	Written/Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.50	Describe mechanisms of action, types, doses, side effects, indications and contraindications of immunomodulators and management of organ transplant rejection	K	KH	Y	Lecture	Written/ Viva voce			
PH1.51	Describe occupational and environmental pesticides, food adulterants, pollutants and insect repellents	K	KH/	Y	Lecture	Written/ Viva voce			
PH1.52	Describe management of common poisoning, insecticides, common sting and bites	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.53	Describe heavy metal poisoning and chelating agents	K	KH	N	Lecture	Written/ Viva voce			
PH1.54	Describe vaccines and their uses	K	KH	Y	Lecture	Written/ Viva voce			
PH1.55	Describe and discuss the following National Health Programmes including Immunisation, Tuberculosis, Leprosy, Malaria, HIV, Filaria, Kala Azar, Diarrhoeal diseases, Anaemia & nutritional disorders, Blindness, Non-communicable diseases, cancer and Iodine deficiency	K	KH	Y	Lecture	Written/ Viva voce			Community Medicine
PH1.56	Describe basic aspects of Geriatric and Pediatric pharmacology	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	
PH1.57	Describe drugs used in skin disorders	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PH1.58	Describe drugs used in Ocular disorders	K	KH	Y	Lecture	Written/ Viva voce		Ophthalmology	
PH1.59	Describe and discuss the following: Essential medicines, Fixed dose combinations, Over the counter drugs, Herbal medicines	K	KH	Y	Lecture	Written/ Viva voce			
PH1.60	Describe and discuss Pharmacogenomics and Pharmacoeconomics	K	KH	N	Lecture	Written/ Viva voce			
PH1.61	Describe and discuss dietary supplements and nutraceuticals	K	KH	N	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.62	Describe and discuss antiseptics and disinfectants	K	KH	Y	Lecture	Written/ Viva voce			
PH1.63	Describe Drug Regulations, acts and other legal aspects	K	KH	Y	Lecture	Written/ Viva voce			
PH1.64	Describe overview of drug development, Phases of clinical trials and Good Clinical Practice	K	KH	Y	Lecture	Written/ Viva voce			
SKILLS: Topic: Clinical Pharmacy Number of competencies: (04) Number of procedures that require certification : (NIL)									
PH2.1	Demonstrate understanding of the use of various dosage forms (oral/local/parenteral; solid/liquid)	S/C	SH	Y	DOAP sessions	Skills assessment			
PH2.2	Prepare oral rehydration solution from ORS packet and explain its use	S/C	SH	Y	DOAP sessions	Skills assessment			
PH2.3	Demonstrate the appropriate setting up of an intravenous drip in a simulated environment	S	SH	Y	DOAP sessions	Skills assessment			
PH2.4	Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations	S	SH	Y	DOAP sessions	Skills assessment		Pediatrics, General Medicine	
SKILLS: Topic: Clinical Pharmacology Number of competencies: (08) Number of procedures that require certification : (04)									
PH3.1	Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient	S/C	P	Y	Skill station	Skill station	5	General Medicine	
PH3.2	Perform and interpret a critical appraisal (audit) of a given prescription	S	P	Y	Skill Lab	Maintenance of log book	3		
PH3.3	Perform a critical evaluation of the drug promotional literature	S	P	Y	Skill Lab	Maintenance of log book/ Skill station	3	General Medicine	
PH3.4	To recognise and report an adverse drug reaction	S	SH	Y	Skill station	Maintenance of log book/ Skill station			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH3.5	To prepare and explain a list of P-drugs for a given case/condition	S	P	Y	Skill station	Maintenance of log book	3	General Medicine	
PH3.6	Demonstrate how to optimize interaction with pharmaceutical representative to get authentic information on drugs	S	SH	N	Skill station	maintenance of log book			
PH3.7	Prepare a list of essential medicines for a healthcare facility	S	SH	Y	Skill station	Maintenance of log book			
PH3.8	Communicate effectively with a patient on the proper use of prescribed medication	C/A	SH	Y	Skill Lab	Skill station			
SKILLS: Topic: Experimental Pharmacology Number of competencies: (02) Number of procedures that require certification :(NIL)									
PH4.1	Administer drugs through various routes in a simulated environment using mannequins	S	SH	Y	DOAP sessions	Skills assessment			
PH4.2	Demonstrate the effects of drugs on blood pressure (vasopressor and vaso-depressors with appropriate blockers) using computer aided learning	S	SH	Y	Skill lab	Skill station			
Communication Topic: Pharmacology Number of competencies: (07) Number of procedures that require certification : (NIL)									
PH5.1	Communicate with the patient with empathy and ethics on all aspects of drug use	A/C	SH	Y	Small group discussion	skill station		General Medicine	
PH5.2	Communicate with the patient regarding optimal use of a) drug therapy, b) devices and c) storage of medicines	A/C	SH	Y	Small group discussion	Skill station			
PH5.3	Motivate patients with chronic diseases to adhere to the prescribed management by the health care provider	A/C	SH	Y	Small group discussion	short note/skill station			
PH5.4	Explain to the patient the relationship between cost of treatment and patient compliance	A/C	SH	Y	Small group discussion	short note/ viva voce		General Medicine	
PH5.5	Demonstrate an understanding of the caution in prescribing drugs likely to produce dependence and recommend the line of management	K	KH	Y	Small group discussion	short note/ Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH5.6	Demonstrate ability to educate public & patients about various aspects of drug use including drug dependence and OTC drugs	A/C	SH	Y	Small group discussion	Skill station		Psychiatry	
PH5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs	K	KH	Y	Small group discussion	short note/ Viva voce			Forensic Medicine

Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication.

Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,

Column F: DOAP session – Demonstrate, Observe, Assess, Perform.

Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

Physiology									
PY3.5	Discuss the action of neuro-muscular blocking agents	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Anaesthesiology, Pharmacology	

Microbiology									
MI1.6	Describe the mechanisms of drug resistance, methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy.	K	K	Y	Lecture , Small group discussion	Written Viva			Pharmacology
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.5	Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology
MI3.6	Describe the etio-pathogenesis of Acid Peptic Disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology

Community Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM3.8	Describe the mode of action & application cycle of commonly used insecticides and rodenticides	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
CM19.1	Define and describe the concept of Essential Medicine List (EML)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
CM19.2	Describe roles of essential medicine in primary health care	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
CM19.3	Describe counterfeit medicine and its prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology

Forensic Medicine & Toxicology

FM4.11	Describe and discuss euthanasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.12	Discuss legal and ethical issues in relation to stem cell research	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.17	Describe and discuss ethical Principles: Respect for autonomy, non-maleficence, beneficence & justice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.22	Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.23	Describe the modified Declaration of Geneva and its relevance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.25	Clinical research & Ethics: Discuss human experimentation including clinical trials	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.26	Discuss the constitution and functions of ethical committees	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.27	Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM8.1	Describe the history of Toxicology	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM8.2	Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.3	Describe the various types of poisons, Toxicokinetics & Toxicodynamics and diagnosis of poisoning in living and dead	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.4	Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.5	Describe Medico-legal autopsy in cases of poisoning including preservation and dispatch of viscera for chemical analysis	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSPE		Pharmacology	
FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce /OSCE		Pharmacology	
FM8.7	Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce /OSCE		Pharmacology, General Medicine	
FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Caustics Inorganic – sulphuric, nitric, and hydrochloric acid Organic- Carbolic Acid (phenol), Oxalic and acetylsalicylic acids.	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.2	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Phosphorus, Iodine, Barium	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.3	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM9.4	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.5	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Organophosphates, Carbamates, Organochlorines, Pyrethroids, Paraquat, Aluminium and Zinc phosphide	K	K/KH	Y	Lectures, Small group discussion Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	Pharmacology
FM9.6	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ammonia, carbon monoxide, hydrogen cyanide & derivatives, methyl isocyanate, tear (riot control) gases	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepines, phenytoin, lithium, haloperidol, neuroleptics, tricyclics iv. Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis vi. Gastro-Intestinal and Endocrinal Drugs – Insulin	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	Pharmacology
Dermatology, Venereology & Leprosy									
DR5.3	Enumerate and describe the pharmacology, administration and adverse reaction of pharmacotherapies for scabies	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pediatrics	Pharmacology
DR7.3	Describe the pharmacology and action of antifungal (systemic and topical). agents Enumerate side effects of antifungal therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology ,Pharmacology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR8.7	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for common viral illnesses of the skin	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
DR9.4	Enumerate, describe and identify lepra reactions and supportive measures and therapy of lepra reactions	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology
DR9.5	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for various classes of leprosy based on National Guidelines	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.6	Describe the treatment of Leprosy based on WHO guidelines	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.7	Enumerate and describe the complications of leprosy and its management, including understanding disability and stigma	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Psychiatry
DR10.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for syphilis	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR10.8	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR11.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR14.5	Enumerate the indications and describe the pharmacology indications and adverse reactions of drugs used in the urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
DR15.3	Enumerate the indications and describe the pharmacology indications and adverse reactions of topical and systemic drugs used in treatment of pyoderma	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery	Microbiology, Pharmacology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Anesthesiology									
AS3.6	Choose and write a prescription for appropriate premedications for patients undergoing surgery	S	SH	Y	DOAP session, Bedside clinic session	Skill station		Pharmacology	
AS4.1	Describe and discuss the pharmacology of drugs used in induction and maintenance of general anaesthesia (including intravenous and inhalation induction agents, opiate and non-opiate analgesics, depolarising and non-depolarising muscle relaxants, anticholinesterases	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pharmacology	
AS4.3	Observe and describe the principles and the practical aspects of induction and maintenance of anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	
AS5.4	Observe and describe the pharmacology and correct use of commonly used drugs and adjuvant agents in regional anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	
AS8.3	Describe the pharmacology and use of drugs in the management of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	
AS8.4	Describe the principles of pain management in palliative care	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	General Medicine
AS8.5	Describe the principles of pain management in the terminally ill	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	General Medicine
AS10.4	Define and describe common medical and medication errors in anaesthesia	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	General Medicine

Psychiatry

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PS4.4	Describe the treatment of alcohol and substance abuse disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS4.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in alcohol and substance abuse	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS5.3	Describe the treatment of schizophrenia including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS5.5	Enumerate and describe the pharmacologic basis and side effects of drugs used in schizophrenia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	
PS6.4	Describe the treatment of depression including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS6.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in depression	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS7.4	Describe the treatment of bipolar disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS7.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in bipolar disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS8.4	Describe the treatment of anxiety disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS8.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in anxiety disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS10.4	Describe the treatment of somatoform disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS10.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in somatoform, dissociative and conversion disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PS11.4	Describe the treatment of personality disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS11.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in personality disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS12.4	Describe the treatment of psychosomatic disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS12.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychosomatic disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS13.4	Describe the treatment of psychosexual and gender identity disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS18.1	Enumerate the indications and describe the pharmacology, dose and side effects of commonly use drugs in psychiatric disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
General Medicine									
IM1.24	Describe and discuss the pharmacology of drugs including indications & contraindications in the management of heart failure including diuretics, ACE inhibitors, Beta blockers, aldosterone antagonists and cardiac glycosides	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM1.27	Describe and discuss the role of penicillin prophylaxis in the prevention of rheumatic heart disease	K	KH	Y	Bedside clinic, Small group discussion	Written		Microbiology Pharmacology	
IM1.30	Administer an intramuscular injection with an appropriate explanation to the patient	S	SH	Y	Bedside clinic, Skill assessment	log book documentation of completion		Pharmacology	
IM2.15	Discuss and describe the medications used in patients with an acute coronary syndrome based on the clinical presentation	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM2.18	Discuss and describe the indications, formulations, doses, side effects and monitoring for drugs used in the management of dyslipidemia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology, Biochemistry	
IM2.20	Discuss and describe the assessment and relief of pain in acute coronary syndromes	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	
IM2.23	Describe and discuss the indications for nitrates, anti platelet agents, gpIIb - IIIa inhibitors, beta blockers, ACE inhibitors etc in the management of coronary syndromes	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	
IM3.12	Select, describe and prescribe based on the most likely aetiology, an appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.13	Select, describe and prescribe based on culture and sensitivity appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM4.22	Describe and discuss the pharmacology, indications, adverse reactions, interactions of antimalarial drugs and basis of resistance	K	KH	Y	Small group, Lecture	Written/ Viva voce		Pharmacology	
IM4.23	Prescribe drugs for malaria based on the species identified, prevalence of drug resistance and National Programs	S	SH	Y	Skill assessment	Skill assessment		Microbiology, Pharmacology	
IM4.26	Counsel the patient on malarial prevention	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	
IM5.7	Enumerate and describe the causes and pathophysiology of drug induced liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pharmacology	
IM5.16	Describe and discuss the management of hepatitis, cirrhosis, portal hypertension, ascites spontaneous, bacterial peritonitis and hepatic encephalopathy	K	KH	Y	Written, Small group	Skill Assessment/ Written/ Viva voce		Pharmacology	General Surgery
IM6.13	Describe and enumerate the indications and side effects of drugs for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM6.17	Discuss and describe the principles of HAART, the classes of antiretrovirals used, adverse reactions and interactions	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.18	Discuss and describe the principles and regimens used in post exposure prophylaxis	K	K	Y	Lecture Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM7.21	Select, prescribe and communicate appropriate medications for relief of joint pain	K/C	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	Orthopedics
IM7.22	Select, prescribe and communicate preventive therapy for crystalline arthropathies	K/C	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	
IM7.23	Select, prescribe and communicate treatment option for systemic rheumatologic conditions	K/C	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	
IM7.24	Describe the basis for biologic and disease modifying therapy in rheumatologic diseases	K	KH	Y	Bed side clinic, Small group discussion	Skill assessment/ written		Pharmacology	
IM8.14	Develop an appropriate treatment plan for essential hypertension	K	KH	Y	Small group discussion	Skill assessment/ Written/ Viva voce		Pharmacology	
IM8.15	Recognise, prioritise and manage hypertensive emergencies	S	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	
IM9.14	Prescribe replacement therapy with iron, B12, folate	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ written		Pharmacology	
IM9.15	Describe the national programs for anemia prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Community Medicine	
IM10.25	Identify and describe the priorities in the management of ARF including diet, volume management, alteration in doses of drugs, monitoring and indications for dialysis	K/C	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM11.16	Discuss and describe the pharmacologic therapies for diabetes their indications, contraindications, adverse reactions and interactions	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM11.18	Describe and discuss the pharmacology, indications, adverse reactions and interactions of drugs used in the prevention and treatment of target organ damage and complications of Type II Diabetes including neuropathy, nephropathy, retinopathy, hypertension, dyslipidemia and cardiovascular disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM11.19	Demonstrate and counsel patients on the correct technique to administer insulin	S/C	SH	Y	DOAP session	Skill assessment		Pharmacology	
IM12.13	Describe the pharmacology, indications, adverse reaction, interactions of thyroxine and antithyroid drugs	K	KH	Y	Lecture, Small group discussion	Viva voce/ short note		Pharmacology	General Surgery
IM12.14	Write and communicate to the patient appropriately a prescription for thyroxine based on age, sex, and clinical and biochemical status	S/C	SH	Y	Skill assessment	Skill assessment		Pharmacology	
IM12.15	Describe and discuss the indications of thionamide therapy, radio iodine therapy and General Surgery in the management of thyrotoxicosis	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	General Surgery
IM13.6	Describe and distinguish the difference between curative and palliative care in patients with cancer	K	K	N	Lecture, Small group discussion	short note/ Viva voce		Pharmacology	
IM13.13	Describe and assess pain and suffering objectively in a patient with cancer	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	General Surgery
IM13.14	Describe the indications for General Surgery, radiation and chemotherapy for common malignancies	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	General Surgery
IM13.17	Describe and enumerate the indications, use, side effects of narcotics in pain alleviation in patients with cancer	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	Anesthesiology
IM14.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for obesity	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology	
IM15.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of pressors used in the treatment of Upper GI bleed	K	K	Y	Lecture, Small group discussion	Viva voce/ short note		Pharmacology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM15.15	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology, Microbiology	General Surgery
IM16.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for parasitic causes of diarrhea	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology, Microbiology	
IM16.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for bacterial and viral diarrhea	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	
IM16.16	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy including immunotherapy	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology	
IM17.11	Describe the indications, pharmacology, dose, side effects of abortive therapy in migraine	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Pharmacology	
IM17.12	Describe the indications, pharmacology, dose, side effects of prophylactic therapy in migraine	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Pharmacology	
IM17.13	Describe the pharmacology, dose, adverse reactions and regimens of drugs used in the treatment of bacterial, tubercular and viral meningitis	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Pharmacology	
IM17.14	Counsel patients with migraine on lifestyle changes and need for prophylactic therapy	A/C	SH	N	DOAP session	Skill Assessment		Pharmacology	
IM19.8	Discuss and describe the pharmacology, dose, side effects and interactions used in the drug therapy of Parkinson's syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM19.9	Enumerate the indications for use of surgery and botulinum toxin in the treatment of movement disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Surgery
IM20.1	Enumerate the poisonous snakes of your area and describe the distinguishing marks of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM20.7	Enumerate the indications and describe the pharmacology, dose, adverse reactions, hypersensitivity reactions of anti-snake venom	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM20.8	Describe the diagnosis, initial approach, stabilisation and therapy of scorpion envenomation	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM20.9	Describe the diagnosis, initial approach, stabilisation and therapy of bee sting allergy	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM21.1	Describe the initial approach to the stabilisation of the patient who presents with poisoning	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM21.2	Enumerate the common plant poisons seen in your area and describe their toxicology, clinical features, prognosis and specific approach to detoxification	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.3	Enumerate the common corrosives used in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.4	Enumerate the commonly observed drug overdose in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.5	Observe and describe the functions and role of a poison center in suspected poisoning	S	KH	Y	DOAP session	document in log book		Forensic Medicine, Pharmacology	
IM21.6	Describe the medico-legal aspects of suspected suicidal or homicidal poisoning and demonstrate the correct procedure to write a medico-legal report on a suspected poisoning	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Forensic Medicine, Pharmacology	
IM21.7	Counsel family members of a patient with suspected poisoning about the clinical and medico-legal aspects with empathy	A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine, Pharmacology	
IM22.3	Describe the approach to the management of hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM25.11	Develop an appropriate empiric treatment plan based on the patient's clinical and immune status pending definitive diagnosis	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	

Pediatrics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE13.5	Propose a management plan for Fe Deficiency Anaemia	S	SH	Y	Bed side clinics, Skill lab	Skill Assessment		Pathology, Pharmacology	
PE13.6	Discuss the National Anaemia Control Program and its recommendations	K	K	Y	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology, Community Medicine	
PE14.1	Discuss the risk factors, clinical features, diagnosis and management of Lead Poisoning	K	KH	N	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology	
PE14.3	Discuss the risk factors, clinical features, diagnosis and management of Organo phosphorous poisoning	K	KH	N	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology	General Medicine
PE14.4	Discuss the risk factors, clinical features, diagnosis and management of paracetamol Poisoning	K	KH	N	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology	
PE24.5	Discuss the role of antibiotics, antispasmodics, anti-secretory drugs, probiotics, anti- emetics in acute diarrheal diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE24.8	Discuss the causes, clinical presentation and management of dysentery in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
General Surgery									
SU13.2	Discuss the Principles of immunosuppressive therapy. Enumerate indications, describe surgical principles, management of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	

Physical Medicine & Rehabilitation

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM3.5	Enumerate the indications and describe the therapies for spasticity including medications, serial casts, nerve blocks, botulinum toxin injections	K	KH	Y	Lectures, Small group discussion			Pharmacology	Pediatrics, Orthopedics
PM7.6	Enumerate the indications and describe the pharmacology and side effects of commonly used drugs in neuropathic bladder	K	KH	Y	Lectures, Small group discussion	Written / Viva voce		Pharmacology	General Medicine
Respiratory Medicine									
CT1.4	Describe the epidemiology, the predisposing factors and microbial and therapeutic factors that determine resistance to drugs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Pharmacology	
CT1.14	Describe and discuss the pharmacology of various antituberculous agents, their indications, contraindications, interactions and adverse reactions	K	KH	Y	Lecture, Small group discussion	short note/ Viva voce		Pharmacology, Microbiology	
CT1.15	Prescribe an appropriate antituberculosis regimen based on the location of disease, smear positivity and negativity and co-morbidities based on current national guidelines including directly observed tuberculosis therapy (DOTS)	K	SH	Y	Bedside clinic, Small group discussion, Lecture	Skill assessment		Pharmacology, Community Medicine	
CT2.16	Discuss and describe therapies for OAD including bronchodilators, leukotriene inhibitors, mast cell stabilisers, theophylline, inhaled and systemic steroids, oxygen and immunotherapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
Orthopaedics									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/S H	Y	Lecture, Small group Discussion, Video assisted lecture	Written/ Viva voce/ OSCE	–	Pathology, Microbiology	General surgery

PATHOLOGY (CODE: PA)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PATHOLOGY									
Topic: Introduction to Pathology Number of competencies: (03) Number of procedures that require certification: (NIL)									
PA1.1	Describe the role of a pathologist in diagnosis and management of disease	K	K	Y	Departmental orientation	Written/ Viva voce			
PA1.2	Enumerate common definitions and terms used in Pathology	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PA1.3	Describe the history and evolution of Pathology	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Cell Injury and Adaptation Number of competencies: (08) Number of procedures that require certification: (NIL)									
PA2.1	Demonstrate knowledge of the causes, mechanisms, types and effects of cell injury and their clinical significance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.2	Describe the etiology of cell injury. Distinguish between reversible-irreversible injury: mechanisms; morphology of cell injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.3	Intracellular accumulation of fats, proteins, carbohydrates, pigments	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.4	Describe and discuss Cell death- types, mechanisms, necrosis, apoptosis (basic as contrasted with necrosis), autolysis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.5	Describe and discuss pathologic calcifications, gangrene	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.6	Describe and discuss cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA2.7	Describe and discuss the mechanisms of cellular aging and apoptosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
PA2.8	Identify and describe various forms of cell injuries, their manifestations and consequences in gross and microscopic specimens	S	SH	Y	DOAP session	Skill assessment			
Topic: Amyloidosis Number of competencies: (02) Number of procedures that require certification: (NIL)									
PA3.1	Describe the pathogenesis and pathology of amyloidosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA3.2	Identify and describe amyloidosis in a pathology specimen	S	SH	N	DOAP session	Skill assessment			
Topic: Inflammation Number of competencies:(04) Number of procedures that require certification: (NIL)									
PA4.1	Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA4.2	Enumerate and describe the mediators of acute inflammation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA4.3	Define and describe chronic inflammation including causes, types, non-specific and granulomatous; and enumerate examples of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA4.4	Identify and describe acute and chronic inflammation in gross and microscopic specimens	S	SH	Y	DOAP session	Skill assessment			
Topic: Healing and repair Number of competencies: (01) Number of procedures that require certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA5.1	Define and describe the process of repair and regeneration including wound healing and its types	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Hemodynamic disorders Number of competencies: (07) Number of procedures that require certification :(NIL)									
PA6.1	Define and describe edema, its types, pathogenesis and clinical correlations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA6.2	Define and describe hyperemia, congestion, hemorrhage	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.3	Define and describe shock, its pathogenesis and its stages	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA6.4	Define and describe normal haemostasis and the etiopathogenesis and consequences of thrombosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.5	Define and describe embolism and its causes and common types	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.6	Define and describe Ischaemia/infarction its types, etiology, morphologic changes and clinical effects	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.7	Identify and describe the gross and microscopic features of infarction in a pathologic specimen	S	SH	Y	DOAP session	Skill Assessment			
Topic: Neoplastic disorders Number of competencies: (05) Number of procedures that require certification: (NIL)									
PA7.1	Define and classify neoplasia. Describe the characteristics of neoplasia including gross, microscopy, biologic, behaviour and spread. Differentiate between benign from malignant neoplasms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA7.2	Describe the molecular basis of cancer	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA7.3	Enumerate carcinogens and describe the process of carcinogenesis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA7.4	Describe the effects of tumor on the host including paraneoplastic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA7.5	Describe immunology and the immune response to cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Microbiology
Topic: Basic diagnostic cytology Number of competencies:(03) Number of procedures that require certification:(NIL)									
PA8.1	Describe the diagnostic role of cytology and its application in clinical care	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA8.2	Describe the basis of exfoliative cytology including the technique & stains used	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		General Surgery	
PA8.3	Observe a diagnostic cytology and its staining and interpret the specimen	S	KH	Y	DOAP session	Skill assessment			
Topic: Immunopathology and AIDS Number of competencies: (07) Number of procedures that require certification: (NIL)									
PA9.1	Describe the principles and mechanisms involved in immunity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
PA9.2	Describe the mechanism of hypersensitivity reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.3	Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.4	Define autoimmunity. Enumerate autoimmune disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA9.5	Define and describe the pathogenesis of systemic Lupus Erythematosus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA9.6	Define and describe the pathogenesis and pathology of HIV and AIDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA9.7	Define and describe the pathogenesis of other common autoimmune diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Infections and Infestations Number of competencies: (04) Number of procedures that require certification:(NIL)									
PA10.1	Define and describe the pathogenesis and pathology of malaria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.2	Define and describe the pathogenesis and pathology of cysticercosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.3	Define and describe the pathogenesis and pathology of leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
Topic: Genetic and paediatric diseases Number of competencies: (03) Number of procedures that require certification :(NIL)									
PA11.1	Describe the pathogenesis and features of common cytogenetic abnormalities and mutations in childhood	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA11.2	Describe the pathogenesis and pathology of tumor and tumour-like conditions in infancy and childhood	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA11.3	Describe the pathogenesis of common storage disorders in infancy and childhood	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
Topic: Environmental and nutritional diseases Number of competencies:(03) Number of procedures that require certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA12.1	Enumerate and describe the pathogenesis of disorders caused by air pollution, tobacco and alcohol	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Community Medicine
PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Pediatrics	
PA12.3	Describe the pathogenesis of obesity and its consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Introduction to haematology Number of competencies: (05) Number of procedures that require certification:(NIL)									
PA13.1	Describe hematopoiesis and extramedullary hematopoiesis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.2	Describe the role of anticoagulants in hematology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.3	Define and classify anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.4	Enumerate and describe the investigation of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.5	Perform, Identify and describe the peripheral blood picture in anemia	S	SH	Y	DOAP session	Skill assessment		General Medicine	
Topic: Microcytic anemia Number of competencies: (03) Number of procedures that require certification:(NIL)									
PA14.1	Describe iron metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PA14.2	Describe the etiology, investigations and differential diagnosis of microcytic hypochromic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA14.3	Identify and describe the peripheral smear in microcytic anemia	S	SH	Y	DOAP session	Skill assessment		General Medicine	
Topic: Macrocytic anemia Number of competencies: (04) Number of procedures that require certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA15.2	Describe laboratory investigations of macrocytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA15.3	Identify and describe the peripheral blood picture of macrocytic anemia	S	SH	Y	DOAP session	Skill assessment			
PA15.4	Enumerate the differences and describe the etiology and distinguishing features of megaloblastic and non-megaloblastic macrocytic anemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Hemolytic anemia Number of competencies: (07) Number of procedures that require certification: (01)									
PA16.1	Define and classify hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.2	Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.4	Describe the etiology pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.5	Describe the peripheral blood picture in different hemolytic anaemias	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA16.6	Prepare a peripheral blood smear and identify hemolytic anaemia from it	S	P	Y	DOAP session	Skill assessment	1		
PA16.7	Discribe the correct technique to perform a cross match	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Aplastic anemia Number of competencies: (02) Number of procedures that require certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA 17.1	Enumerate the etiology, pathogenesis and findings in aplastic anemia	K	K	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA17.2	Enumerate the indications and describe the findings in bone marrow aspiration and biopsy	K	K	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Leukocyte disorders Number of competencies: (02) Number of procedures that require certification:(NIL)									
PA18.1	Enumerate and describe the causes of leucocytosis leucopenia lymphocytosis and leukemoid reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA`18.2	Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Lymph node and spleen Number of competencies: (07) Number of procedures that require certification:(NIL)									
PA19.1	Enumerate the causes and describe the differentiating features of lymphadenopathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.2	Describe the pathogenesis and pathology of tuberculous lymphadenitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.3	Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	S	SH	Y	DOAP session	Skill assessment			
PA19.4	Describe and discuss the pathogenesis, pathology and the differentiating features of Hodgkin's and non-Hodgkin's lymphoma	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.5	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	S	SH	Y	DOAP session	Skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA19.6	Enumerate and differentiate the causes of splenomegaly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA19.7	Identify and describe the gross specimen of an enlarged spleen	S	SH	Y	DOAP session	Skill assessment			
Topic: Plasma cell disorders Number of competencies: (01) Number of procedures that require certification: (NIL)									
PA20.1	Describe the features of plasma cell myeloma	S	SH	Y	DOAP session	Skill assessment			
Topic: Hemorrhagic disorders Number of competencies: (05) Number of procedures that require certification:(NIL)									
PA21.1	Describe normal hemostasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA21.2	Classify and describe the etiology, pathogenesis and pathology of vascular and platelet disorders including ITP and haemophilia's	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA21.3	Differentiate platelet from clotting disorders based on the clinical and hematologic features	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA21.4	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of disseminated intravascular coagulation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA21.5	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of Vitamin K deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Blood banking and transfusion Number of competencies: (07) Number of procedures that require certification: (NIL)									
PA22.1	Classify and describe blood group systems (ABO and RH)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA22.2	Enumerate the indications, describe the principles, enumerate and demonstrate the steps of compatibility testing	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA22.4	Enumerate blood components and describe their clinical uses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA22.5	Enumerate and describe infections transmitted by blood transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA22.6	Describe transfusion reactions and enumerate the steps in the investigation of a transfusion reaction	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA22.7	Enumerate the indications and describe the principles and procedure of autologous transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Clinical Pathology Number of competencies: (03) Number of procedures that require certification: (NIL)									
PA23.1	Describe abnormal urinary findings in disease states and identify and describe common urinary abnormalities in a clinical specimen	S	SH	Y	DOAP session	Skill Assessment			
PA23.2	Describe abnormal findings in body fluids in various disease states	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA23.3	Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests	S	SH	Y	DOAP session	Skill Assessment			
Topic: Gastrointestinal tract Number of competencies: (07) Number of procedures that require certification: (NIL)									
PA24.1	Describe the etiology, pathogenesis, pathology and clinical features of oral cancers	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Dentistry	
PA24.2	Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of peptic ulcer disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA24.3	Describe and identify the microscopic features of peptic ulcer	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA24.4	Describe and etiology and pathogenesis and pathologic features of carcinoma of the stomach	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.5	Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.6	Describe and etiology and pathogenesis and pathologic and distinguishing features of Inflammatory bowel disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.7	Describe the etiology, pathogenesis, pathology and distinguishing features of carcinoma of the colon	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Hepatobiliary system Number of competencies: (06) Number of procedures that require certification: (01)									
PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA25.2	Describe the pathophysiology and pathologic changes seen in hepatic failure and their clinical manifestations, complications and consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.3	Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA25.4	Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.5	Describe the etiology, pathogenesis and complications of portal hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.6	Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	S	P	Y	DOAP session	Skill assessment	1	General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
Topic: Respiratory system		Number of competencies: (07)			Number of procedures that require certification: (NIL)				
PA26.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA26.4	Define and describe the etiology, types, pathogenesis, stages, morphology microscopic appearance and complications of tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.5	Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	
PA26.6	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, stages, morphology, microscopic appearance,metastases and complications of tumors of the lung and pleura	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA26.7	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	K	KH	N	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	
Topic: Cardiovascular system		Number of competencies: (10)			Number of procedures that require certification: (NIL)				
PA27.1	Distinguish arteriosclerosis from atherosclerosis. Describe the pathogenesis and pathology of various causes and types of arteriosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.2	Describe the etiology, dynamics, pathology types and complications of aneurysms including aortic aneurysms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA27.3	Describe the etiology, types, stages pathophysiology, pathology and complications of heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.4	Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.5	Describe the epidemiology, risk factors, etiology, pathophysiology, pathology, presentations, gross and microscopic features, diagnostic tests and complications of ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.6	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.7	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of pericarditis and pericardial effusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	S	SH	Y	DOAP session	Skill Assessment		Physiology, General Medicine	
PA27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.10	Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
Topic: Urinary Tract Number of competencies: (16) Number of procedures that require certification: (NIL)									
PA28.1	Describe the normal histology of the kidney	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PA28.2	Define, classify and distinguish the clinical syndromes and describe the etiology, pathogenesis, pathology, morphology, clinical and laboratory and urinary findings, complications of renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA28.3	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings, progression and complications of acute renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.4	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings progression and complications of chronic renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA28.6	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of IgA nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.7	Enumerate and describe the findings in glomerular manifestations of systemic disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.8	Enumerate and classify diseases affecting the tubular interstitium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.9	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of acute tubular necrosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA28.11	Define classify and describe the etiology, pathogenesis pathology, laboratory, urinary findings, distinguishing features progression and complications of vascular disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA28.12	Define classify and describe the genetics, inheritance, etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
PA28.13	Define classify and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features progression and complications of renal stone disease and obstructive uropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA28.14	Classify and describe the etiology, genetics, pathogenesis, pathology, presenting features, progression and spread of renal tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA28.15	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of thrombotic angiopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.16	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Male Genital Tract Number of competencies: (05) Number of procedures that require certification: (NIL)									
PA29.1	Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.2	Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.3	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, urologic findings & diagnostic tests of benign prostatic hyperplasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.4	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA29.5	Describe the etiology, pathogenesis, pathology and progression of prostatitis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Female Genital Tract Number of competencies: (09) Number of procedures that require certification: (NIL)									
PA30.1	Describe the epidemiology, pathogenesis, etiology, pathology, screening, diagnosis and progression of carcinoma of the cervix	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.2	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the endometrium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.3	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the leiomyomas and leiomyosarcomas	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.4	Classify and describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of ovarian tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.5	Describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of gestational trophoblastic neoplasms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.6	Describe the etiology and morphologic features of cervicitis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.7	Describe the etiology, hormonal dependence, features and morphology of endometriosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.8	Describe the etiology and morphologic features of adenomyosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA30.9	Describe the etiology, hormonal dependence and morphology of endometrial hyperplasia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
Topic: Breast Number of competencies: (04) Number of procedures that require certification: (NIL)									
PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA31.2	Classify and describe the epidemiology, pathogenesis, classification, morphology, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA31.3	Describe and identify the morphologic and microscopic features of carcinoma of the breast	S	SH	N	DOAP session	Skill Assessment		General Surgery	
PA31.4	Enumerate and describe the etiology, hormonal dependency and pathogenesis of gynecomastia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
Topic: Endocrine system Number of competencies: (09) Number of procedures that require certification: (NIL)									
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	K	KH	Y	Lecture, Small group	Written/ Viva voce		Physiology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.6	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
Topic: Bone and soft tissue Number of competencies: (05) Number of procedures that require certification: (NIL)									
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopaedics	Microbiology
PA33.2	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Orthopaedics	
PA33.3	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of soft tissue tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Orthopaedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA33.4	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Orthopaedics	
PA33.5	Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Skin Number of competencies: (04) Number of procedures that require certification:(NIL)									
PA34.1	Describe the risk factors pathogenesis, pathology and natural history of squamous cell carcinoma of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.2	Describe the risk factors pathogenesis, pathology and natural history of basal cell carcinoma of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.3	Describe the distinguishing features between a nevus and melanoma. Describe the etiology, pathogenesis, risk factors morphology clinical features and metastases of melanoma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.4	Identify, distinguish and describe common tumors of the skin	S	SH	N	DOAP session	Skill Assessment		Dermatology, Venereology & Leprosy	
Topic: Central Nervous System Number of competencies:(03) Number of procedures that require certification: (01)									
PA35.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA35.2	Classify and describe the etiology, genetics, pathogenesis, pathology, presentation sequelae and complications of CNS tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA35.3	Identify the etiology of meningitis based on given CSF parameters	S	P	Y	DOAP session	Skill Assessment	1	General Medicine	Microbiology
Topic: Eye Number of competencies: (01) Number of procedures that require certification:(NIL)									
PA36.1	Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Ophthalmology	
Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, S - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform. Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation									
Integration									
Human Anatomy									
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology
AN66.2	Describe the ultrastructure of connective tissue	K	KH	N	Lecture, Practical	Written		Pathology	
AN70.1	Identify exocrine gland under the microscope & distinguish between serous, mucous and mixed acini	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph node, spleen, thymus, tonsil and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN71.1	Identify bone under the microscope, Classify various types and describe the structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
AN71.2	Identify cartilage under the microscope & describe various types and structure- function correlation of the same describe various types and structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Physiology									
PY1.4	Describe apoptosis – programmed cell death	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PY2.5	Describe different types of anemia & Jaundice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	Biochemistry
PY2.8	Describe the physiological basis of hemostasis and anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PY2.9	Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	K	KH	Y	Lecture, Small group discussion, ECE- Visit to blood bank	Written/ Viva voce		Pathology	
PY2.11	Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT	S	SH	Y	DOAP sessions	Practical/OSPE/ viva voce		Pathology	
PY2.12	Describe test for ESR, Osmotic fragility, Hematocrit. Note the findings and interpret the test results etc	K	KH	Y	Demonstration	Written/ Viva voce		Pathology	
PY2.13	Describe steps for reticulocyte and platelet count	K	KH	Y	Demonstration sessions	Written/ Viva voce		Pathology	
PY3.6	Describe the pathophysiology of Myasthenia gravis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
Biochemistry									
BI2.4	Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	K	KH	Y	Lecture, small group discussions	Written/ Viva voce		Pathology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
BI2.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions	K	KH	Y	Lecture, small group discussions	Written/ Viva voce		Pathology, General Medicine	
BI2.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions	K	KH	Y	Lecture, Small group discussion /DOAP sessions	Written/ Viva voce		Pathology, General Medicine	
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI7.7	Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/obesity	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables (macro-molecules & its importance)	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
BI10.1	Describe the cancer initiation, promotion oncogenes & oncogene activation	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	Physiology
BI10.5	Describe antigens and concepts involved in vaccine development	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
BI11.17	Explain the basis and rationale of biochemical tests done in the following conditions: diabetes mellitus, dyslipidemia, myocardial infarction, renal failure, gout, proteinuria, nephrotic syndrome, edema, jaundice, liver diseases, pancreatitis, disorders of acid-base balance, thyroid disorders	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	
Microbiology									
MI1.7	Describe the immunological mechanisms in health	K	KH	Y	Lecture	Written/ Viva voce			Pathology
MI1.8	Describe the mechanisms of immunity and response of the host immune system to infections	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	Pathology
MI2.1	Describe the etiologic agents in rheumatic fever and their diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.2	Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.3	Identify the microbial agents causing Rheumatic heart disease & infective Endocarditis	S	SH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia	K	KH	Y	Lecture, Small group discussion	Written/ viva voce		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
MI2.5	Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kala azar, malaria, filariasis and other common parasites prevalent in India	K	KH	Y	Lecture, Small group discussion	Written/ viva voce		General Medicine	Pathology
MI2.7	Describe the epidemiology, the etio-pathogenesis, evolution, complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI3.1	Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features, and diagnostic modalities of these agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.4	Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness	S	KH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI3.6	Describe the etio-pathogenesis of Acid Peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.7	Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis, and prevention of viral hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI3.8	Choose the appropriate laboratory test in the diagnosis of viral hepatitis	K	KH	Y	small group discussion, Case discussion	Written/ Viva voce/ OSPE		General Medicine	Pathology
MI5.1	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI5.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis.	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
MI8.2	Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Pathology
MI8.3	Describe the role of oncogenic viruses in the evolution of virus associated malignancy	K	KH	Y	Lecture	Written		General Medicine	Pathology
Community Medicine									
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology, Pathology
Forensic Medicine & Toxicology									
FM2.1	Define, describe and discuss death and its types including somatic/clinical/cellular, molecular and brain-death, Cortical death and Brainstem death	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.2	Describe and discuss natural and unnatural deaths	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.3	Describe and discuss issues related to sudden natural deaths	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.5	Discuss moment of death, modes of death-coma, asphyxia and syncope	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.11	Describe and discuss autopsy procedures including post-mortem examination, different types of autopsies, aims and objectives of post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/viva voce/ OSPE			Pathology
FM2.12	Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/viva voce/ OSPE			Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
FM2.13	Describe and discuss obscure autopsy	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM3.28	Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	K	K/KH	Y	Lecture, Small group discussion	Written/viva voce		Obstetrics & Gynaecology, Pathology	
FM6.1	Describe different types of specimens and tissues to be collected both in the living and dead: body fluids (blood, urine, semen, faeces, saliva), skin, nails, tooth pulp, vaginal smear, viscera, skull, specimen for histo-pathological examination, blood grouping, HLA Typing and DNA Fingerprinting. Describe Locard's Exchange Principle	K	K/KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin	S	KH	Y	Small group discussion, Lecture	Log book/ skill station/ Viva voce		Forensic Medicne, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & RH blood group of a person	S	SH	Y	Small group discussion, DOAP session	Log book/ skill station/ Viva voce		Forensic Medicne, Physiology	
Dermatology, Venereology & Leprosy									
DR12.7	Identify and distinguish fixed drug eruptions and Steven Johnson syndrome from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment	1	General Medicine	Pathology, Microbiology
DR14.1	Describe the etiology, pathogenesis and clinical precipitating features and classification of Urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology, Pathology
DR16.1	Identify and distinguish skin lesions of SLE	S	SH	Y	Bedside clinic discussion	Skill assessment	2	General Medicine	Pathology
DR16.2	Identify and distinguish Raynaud's phenomenon	S	SH	Y	Bedside clinic discussion	Skill assessment	2	General Medicine	Pathology
Anesthesiology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
AS9.4	Enumerate blood products and describe the use of blood products in the preoperative period	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pathology	General Surgery
ENT									
EN1.2	Describe the pathophysiology of common diseases in ENT	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pathology	
Ophthalmology									
OP7.2	Describe and discuss the aetio-pathogenesis, stages of maturation and complications of cataract	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
OP8.1	Discuss the aetiology, pathology, clinical features and management of vascular occlusions of the retina	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Pathology	
Dentistry									
DE4.1	Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity	K	K	N	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.2	Discuss the role of etiological factors in the formation of precancerous /cancerous lesions	K	KH	Y	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.3	Identify potential pre-cancerous / cancerous lesions	S	SH	N	Observation, Bed side clinics	Skill assessment		Pathology	ENT
DE4.4	Counsel patients to risks of oral cancer with respect to tobacco, smoking, alcohol and other causative factors.	A/C	SH	Y	DOAP session	Document in Log book	2	Pathology	ENT
General Medicine									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM1.1	Describe and discuss the epidemiology, pathogenesis clinical evolution and course of common causes of heart disease including: rheumatic/ valvular, ischemic, hypertrophic inflammatory	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.2	Describe and discuss the genetic basis of some forms of heart failure	K	KH	N	Lecture, Small group discussion	Written		Pathology, Physiology	
IM1.3	Describe and discuss the aetiology, microbiology, pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.4	Stage heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.5	Describe, discuss and differentiate the processes involved in R vs L heart failure, systolic vs diastolic failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.6	Describe and discuss the compensatory mechanisms involved in heart failure including cardiac remodelling and neurohormonal adaptations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.7	Enumerate, describe and discuss the factors that exacerbate heart failure including ischemia, arrhythmias, anemia, thyrotoxicosis, dietary factors drugs etc.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.8	Describe and discuss the pathogenesis and development of common arrhythmias involved in heart failure particularly atrial fibrillation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.9	Describe and discuss the clinical presentation and features, diagnosis, recognition and management of acute rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis and ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Community Medicine	
IM2.2	Discuss the aetiology of risk factors both modifiable and non-modifiable of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.4	Discuss and describe the pathogenesis natural history, evolution and complications of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.5	Define the various acute coronary syndromes and describe their evolution, natural history and outcomes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM3.1	Define, discuss, describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture , Small group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM3.3	Discuss and describe the pathogenesis, presentation, natural history and complications of pneumonia	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Microbiology	
IM4.5	Describe and discuss the pathophysiology and manifestations of malignant causes of fever including hematologic and lymph node malignancies	K	KH	Y	Lecture, Small group discussion	written		Pathology, Microbiology	
IM4.12	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bed side clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
IM4.16	Enumerate the indications and describe the findings in tests of inflammation and specific rheumatologic tests, serologic testing for pathogens including HIV, bone marrow aspiration and biopsy	K	KH	N	Lecture, Small group discussion	written		Pathology	
IM4.17	Observe and assist in the performance of a bone marrow aspiration and biopsy in a simulated environment	S	SH	N	skills lab	log book documentation/ DOAP session		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM5.1	Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia	K	K	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, Physiology	
IM5.2	Describe and discuss the aetiology and pathophysiology of liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM5.3	Describe and discuss the pathologic changes in various forms of liver disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.4	Describe and discuss the epidemiology, microbiology, immunology and clinical evolution of infective (viral) hepatitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM5.5	Describe and discuss the pathophysiology and clinical evolution of alcoholic liver disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.6	Describe and discuss the pathophysiology, clinical evolution and complications of cirrhosis and portal hypertension including ascites, spontaneous bacterial peritonitis, hepatorenal syndrome and hepatic encephalopathy	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.7	Enumerate and describe the causes and pathophysiology of drug induced liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pharmacology	
IM5.12	Choose and interpret appropriate diagnostic tests including: CBC, bilirubin, function tests, Hepatitis serology and ascitic fluid examination in patient with liver diseases	S	KH	Y	Bedside clinic, DOAP session	Skill assessment		Pathology	
IM5.14	Outline a diagnostic approach to liver disease based on hyperbilirubinemia, liver function changes and hepatitis serology	S	SH	Y	Bedside clinic, Small group discussion	viva voce/ written		Pathology, Microbiology	
IM6.5	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related malignancies	K	KH	Y	Lecture, Small group discussion	short notes/ Viva voce		Pathology, Microbiology	
IM6.6	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related skin and oral lesions	K	KH	Y	Lecture, Small group discussion	short notes/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM6.10	Choose and interpret appropriate diagnostic tests to diagnose and classify the severity of HIV-AIDS including specific tests of HIV, CDC	K	KH	Y	Bed side clinic, DOAP session, Small group discussion	written/ Skill assessment		Pathology, Microbiology	
IM6.19	Enumerate the indications of and discuss about prophylactic drugs used to prevent HIV related opportunistic infections	K/C	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM7.1	Describe the pathophysiology of autoimmune disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM7.2	Describe the genetic basis of autoimmune disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM7.16	Enumerate the indications for and interpret the results of: CBC, anti CCP (Anti-cyclic citrullinated peptide), RA, ANA, DNA and other tests of autoimmunity	K	SH	Y	Bed side clinic, small group	Skill assessment/ written		Pathology	
IM8.1	Describe and discuss the epidemiology, aetiology and the prevalence of primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.2	Describe and discuss the pathophysiology of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.3	Describe and discuss the genetic basis of hypertension	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.4	Define and classify hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.5	Describe and discuss the differences between primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.7	Describe and discuss the clinical manifestations of the various aetiologies of secondary causes of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.8	Describe, discuss and identify target organ damage due to hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM9.1	Define, describe and classify anemia based on red blood cell size and reticulocyte count	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM9.2	Describe and discuss the morphological characteristics, aetiology and prevalence of each of the causes of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM9.6	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	S	SH	Y	Bed side clinic, DOAP session, Small group discussion	Skill assessment/ written		Pathology	
IM9.7	Describe the appropriate diagnostic work up based on the presumed aetiology	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ written		Pathology	
IM9.8	Describe and discuss the meaning and utility of various components of the hemogram	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.9	Describe and discuss the various tests for iron deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.10	Order and interpret tests for anemia including hemogram, red cell indices, reticulocyte count, iron studies, B12 and folate.	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ written		Pathology	
IM9.11	Describe, perform and interpret a peripheral smear and stool occult blood	S	SH	P	Bed side clinic, DOAP session	Skill assessment/ written		Pathology	
IM9.12	Describe the indications and interpret the results of a bone marrow aspirations and biopsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.13	Describe, develop a diagnostic plan to determine the aetiology of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.18	Describe the indications for blood transfusion and the appropriate use of blood components	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM10.1	Define, describe and differentiate between acute and chronic renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM10.2	Classify, describe and differentiate the pathophysiologic causes of acute renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.3	Describe the pathophysiology and causes of pre renal ARF, renal and post renal ARF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.4	Describe the evolution, natural history and treatment of ARF	K	KH	Y	Lecture, small group	Written/ Viva voce		Pathology	
IM10.5	Describe and discuss the aetiology of CRF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.6	Stage Chronic Kidney Disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.7	Describe and discuss the pathophysiology and clinical findings of uraemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.8	Classify, describe and discuss the significance of proteinuria in CKD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.9	Describe and discuss the pathophysiology of anemia and hyperparathyroidism in CKD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.10	Describe and discuss the association between CKD glycemia and hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.11	Describe and discuss the relationship between CAD risk factors and CKD and in dialysis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.16	Enumerate the indications for and interpret the results of: renal function tests, calcium, phosphorus, PTH, urine electrolytes, osmolality, Anion gap	K	KH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce		Pathology	
IM10.17	Describe and calculate indices of renal function based on available laboratories including FENa (Fractional Excretion of Sodium) and CrCl (Creatinine Clearance)	S	SH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce		Pathology	
IM11.2	Describe and discuss the epidemiology and pathogenesis and risk factors and clinical evolution of type 1 diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM11.3	Describe and discuss the epidemiology and pathogenesis and risk factors, economic impact and clinical evolution of type 2 diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.5	Describe and discuss the pathogenesis and temporal evolution of microvascular and macrovascular complications of diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.11	Order and interpret laboratory tests to diagnose diabetes and its complications including: glucoses, glucose tolerance test, glycosylated hemoglobin, urinary micro albumin, ECG, electrolytes, ABG, ketones, renal function tests and lipid profile	S	SH	Y	Bed side clinic, DOAP session, Small group discussion	Skill assessment		Pathology	
IM11.12	Perform and interpret a capillary blood glucose test	S	P	Y	Bed side clinic, DOAP session, Small group discussion	Skill assessment	2	Pathology, Biochemistry	
IM11.13	Perform and interpret a urinary ketone estimation with a dipstick	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.1	Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.3	Describe and discuss the physiology of the hypothalamo-pituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	K	K	Y	Lecture, Small group discussion	short notes		Pathology, Physiology	
IM13.1	Describe the clinical epidemiology and inherited & modifiable risk factors for common malignancies in India	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Biochemistry	
IM13.2	Describe the genetic basis of selected cancers	K	K	N	Lecture, Small group discussion	short note/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM13.3	Describe the relationship between infection and cancers	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Microbiology	
IM13.4	Describe the natural history, presentation, course, complications and cause of death for common cancers	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	
IM13.15	Describe the need, tests involved, their utility in the prevention of common malignancies	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pathology	
IM14.2	Describe and discuss the aetiology of obesity including modifiable and non-modifiable risk factors and secondary causes	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology	
IM14.3	Describe and discuss the monogenic forms of obesity	K	K	N	Lecture, Small group discussion	short note/ Viva voce		Pathology	
IM14.4	Describe and discuss the impact of environmental factors including eating habits, food, work, environment and physical activity on the incidence of obesity	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Community Medicine	
IM14.5	Describe and discuss the natural history of obesity and its complications	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology	
IM15.1	Enumerate, describe and discuss the aetiology of upper and lower GI bleeding	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology	General Surgery
IM15.2	Enumerate, describe and discuss the evaluation and steps involved in stabilizing a patient who presents with acute volume loss and GI bleed	S	SH	Y	DOAP session, Small group discussion, Lecture	Written/ Viva voce/ Skill assessment		Pathology	General Surgery
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussion	Short note/ viva voce		Pathology, Physiology	General Surgery
IM15.9	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, PT and PTT, stool examination, occult blood, liver function tests, H.pylori test	S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment/ Short note/ Viva voce		Pathology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM15.11	Develop document and present a treatment plan that includes fluid resuscitation, blood and blood component transfusion and specific therapy for arresting blood loss	S	KH	Y	Lecture, Small group discussion	Short note/ viva voce		Pathology	General Surgery
IM15.12	Enumerate the indications for whole blood, component and platelet transfusion and describe the clinical features and management of a mismatched transfusion	K	K	Y	Lecture, Small group discussion	Short note/ viva voce		Pathology	General Surgery
IM15.13	Observe cross matching and blood / blood component transfusion	S	SH	Y	Bedside clinic	Short note/ Viva voce/ Skill assessment		Pathology	General Surgery
IM16.4	Elicit and document and present an appropriate history that includes the natural history, dietary history, travel, sexual history and other concomitant illnesses	S	SH	Y	Bedside clinic skills lab	Skill assessment		Microbiology, Pathology	
IM16.8	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, and stool examination	S	SH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce		Microbiology, Pathology	
IM16.12	Enumerate and discuss the indications for further investigations including antibodies, colonoscopy, diagnostic imaging and biopsy in the diagnosis of chronic diarrhea	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM16.15	Distinguish, based on the clinical presentation, Crohn's disease from ulcerative colitis	S	SH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM17.7	Enumerate the indications and describe the findings in the CSF in patients with meningitis	K	K	Y	Small group, Bedside clinic	Skill Assessment		Microbiology, Pathology	
IM17.8	Demonstrate in a mannequin or equivalent the correct technique for performing a lumbar puncture	S	SH	Y	DOAP session	Skill assessment		Microbiology, Pathology	
IM17.9	Interpret the CSF findings when presented with various parameters of CSF fluid analysis	S	SH	Y	Small group discussion, Bedside clinic	Skill assessment		Microbiology, Pathology	
IM18.2	Classify cerebrovascular accidents and describe the aetiology, predisposing genetic and risk factors pathogenesis of hemorrhagic and non hemorrhagic stroke	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM18.3	Elicit and document and present an appropriate history including onset, progression precipitating and aggravating relieving factors, associated symptoms that help identify the cause of the cerebrovascular accident	S	SH	Y	Bedside clinic	Skill assessment		Pathology	
IM22.1	Enumerate the causes of hypercalcemia and distinguish the features of PTH vs non PTH mediated hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM22.2	Describe the aetiology, clinical manifestations, diagnosis and clinical approach to primary hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM22.4	Enumerate the components and describe the genetic basis of the multiple endocrine neoplasia syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM25.7	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, blood biochemistry, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bed side clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
Obstetrics & Gynaecology									
OG10.2	Enumerate the indications and describe the appropriate use of blood and blood products, their complications and management	K	KH	Y	Lecture, Small group discussion			Pathology	
Pediatrics									
PE11.1	Describe the common etiology, clinical features and management of obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE11.2	Discuss the risk approach for obesity and discuss the prevention strategies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PE12.7	Describe the causes, clinical features, diagnosis and management of deficiency /excess of Vitamin D (Rickets and Hypervitaminosis D)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	p	Y	Bedside clinics, Skills lab	Document in log book	3	Biochemistry, Physiology Pathology	
PE12.9	Assess patients with Vitamin D deficiency, diagnose, classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.13	Discuss the RDA , dietary sources of Vitamin K and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis, management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.2	Describe the causes, diagnosis and management of Fe deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology Biochemistry	
PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis	S	SH	Y	Bed side clinics, Skill Lab	Document in log book		Pathology, Biochemistry	
PE13.4	Interpret hemogram and Iron Panel	S	P	Y	Bed side clinic, Small group discussion	Skill Assessment	5	Pathology, Biochemistry	
PE13.5	Propose a management plan for Fe Deficiency Anaemia	S	SH	Y	Bed side clinics, Skill lab	Skill Assessment		Pathology, Pharmacology	
PE21.2	Enumerate the etio-pathogenesis, clinical features, complications and management of Acute post streptococcal Glomerular Nephritis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.3	Discuss the approach and referral criteria to a child with Proteinuria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

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PE21.5	Enumerate the etio-pathogenesis clinical features, complications and management of Acute Renal Failure in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.6	Enumerate the etio-pathogenesis, clinical features, complications and management of Chronic renal Failure in Children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.7	Enumerate the etio-pathogenesis clinical features, complications and management of Wilms Tumor	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.11	Perform and interpret the common analytes in a Urine examination	S	SH	Y	Bed side clinic Labs, Skill lab	Skill assessment		Biochemistry, Pathology	
PE23.1	Discuss the Hemodynamic changes, clinical presentation, complications and management of Acyanotic Heart Diseases –VSD, ASD and PDA	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.2	Discuss the Hemodynamic changes, clinical presentation, complications and management of Cyanotic Heart Diseases – Fallot's Physiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.3	Discuss the etio-pathogenesis, clinical presentation and management of cardiac failure in infant and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.4	Discuss the etio-pathogenesis, clinical presentation and management of Acute Rheumatic Fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.5	Discuss the clinical features, complications, diagnosis, management and prevention of Acute Rheumatic Fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE24.1	Discuss the etio-pathogenesis, classification, clinical presentation and management of diarrheal diseases in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PE24.2	Discuss the classification and clinical presentation of various types of diarrheal dehydration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE25.1	Discuss the etio-pathogenesis, clinical presentation and management of Malabsorption in children and its causes including celiac disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE26.1	Discuss the etio-pathogenesis, clinical features and management of acute hepatitis in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.2	Discuss the etio-pathogenesis, clinical features and management of Fulminant Hepatic Failure in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.3	Discuss the etio-pathogenesis, clinical features and management of chronic liver diseases in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.4	Discuss the etio-pathogenesis, clinical features and management of Portal Hypertension in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology	
PE26.9	Interpret Liver Function Tests, viral markers, ultra sonogram report	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment		Pathology	
PE29.1	Discuss the etio-pathogenesis, clinical features, classification and approach to a child with anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.2	Discuss the etio-pathogenesis, clinical features and management of Iron Deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.3	Discuss the etiopathogenesis, clinical features and management of VIT B12, Folate deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.4	Discuss the etio-pathogenesis, clinical features and management of Hemolytic anemia, Thalassemia Major, Sick cell anaemia, Hereditary spherocytosis, Auto-immune hemolytic anaemia and hemolytic uremic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PE29.6	Discuss the cause of thrombocytopenia in children: describe the clinical features and management of Idiopathic Thrombocytopenic Purpura (ITP)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.7	Discuss the etiology, classification, pathogenesis and clinical features of Hemophilia in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.8	Discuss the etiology, clinical presentation and management of Acute Lymphoblastic Leukemia in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.9	Discuss the etiology, clinical presentation and management of lymphoma in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
General Surgery									
SU2.1	Describe pathophysiology of shock, types of shock, principles of resuscitation including fluid replacement and monitoring	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
SU3.1	Describe the indications and appropriate use of blood and blood products and complications of blood transfusion.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce.		Pathology	
SU5.1	Describe normal wound healing and factors affecting healing.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU22.2	Describe the etiopathogenesis of thyroidal swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology,	
Respiratory Medicine									
CT2.1	Define and classify obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.2	Describe and discuss the epidemiology, risk factors and evolution of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
CT2.4	Describe and discuss the physiology and pathophysiology of hypoxia and hypercapnia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.5	Describe and discuss the genetics of alpha 1 antitrypsin deficiency in emphysema	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.6	Describe the role of the environment in the cause and exacerbation of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
CT2.7	Describe and discuss allergic and non-allergic precipitants of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology,	
CT2.11	Describe, discuss and interpret pulmonary function tests	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Physiology, Pathology	
Orthopaedics									
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/S H	Y	Lecture, Small group discussion, Video assisted lecture	Written/ Viva voce/ OSCE		Pathology, Microbiology	General surgery
OR4.1	Describe and discuss the clinical features, investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abscess and caries spine	K	K/KH	Y	Lecture, Small group discussion, Case discussion	Written/ Viva voce/ OSCE		Pathology	General surgery
OR10.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of benign and malignant bone tumours and pathological fractures	K	K/KH	Y	Lecture, Small group discussion, Video assisted interactive lecture	Written/ Viva voce OSCE		Pathology	General surgery, Radiotherapy
Radiotherapy									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
RT1.3	Enumerate, describe and discuss classification and staging of cancer (AJCC, FIGO etc.)	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, General Medicine
RT4.5	Describe and discuss role of radiation in management of common malignancies in India (region specific)	K	KH	Y	Lecture and Bed side clinic	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.6	Describe and discuss radiotherapy for benign disease	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	K/A/S	KH	Y	Bed side clinic, Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	K	K	Y	Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology

MICROBIOLOGY (CODE: MI)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MICROBIOLOGY									
Topic: General Microbiology and Immunity Number of competencies: (11) Number of procedures that require certification : (01)									
MI1.1	Describe the different causative agents of Infectious diseases+A208, the methods used in their detection, and discuss the role of microbes in health and disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
MI1.2	Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy	S	P	Y	DOAP session	Skill assessment	5		
MI1.3	Describe the epidemiological basis of common infectious diseases	K	KH	Y	Lecture	Written/ Viva voce			Community Medicine
MI1.4	Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
MI1.5	Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice	K	KH	Y	Small group discussion, Case discussion	Written/Viva voce/ OSPE		General Surgery	
MI1.6	Describe the mechanisms of drug resistance, and the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
MI1.7	Describe the immunological mechanisms in health	K	KH	Y	Lecture	Written/ Viva voce			Pathology
MI1.8	Describe the mechanisms of immunity and response of the host immune system to infections	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI1.9	Discuss the immunological basis of vaccines and describe the Universal Immunisation schedule	K	KH	Y	Lecture	Written/ Viva voce		Paediatrics	
MI1.10	Describe the immunological mechanisms in immunological disorder (hypersensitivity, autoimmune disorders and immunodeficiency states) and discuss the laboratory methods used in detection.	K	KH	Y	Lecture	Written/ Viva voce		Paediatrics	
MI1.11	Describe the immunological mechanisms of transplantation and tumor immunity	K	KH	Y	Lecture	Written/ Viva voce			
Topic: CVS and Blood Number of competencies: (7) Number of procedures that require certification : (NIL)									
MI2.1	Describe the etiologic agents in rheumatic fever and their diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.2	Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.3	Identify the microbial agents causing Rheumatic Heart Disease & infective Endocarditis	S	SH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.5	Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kalaazar, malaria, filariasis and other common parasites prevalent in India	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.6	Identify the causative agent of malaria and filariasis	K/S	SH	Y	DOAP session	Skill assessment		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI2.7	Describe the epidemiology, the etio- pathogenesis, evolution complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
Topic: Gastrointestinal and hepatobiliary system Number of competencies: (8) Number of procedures that require certification : (NIL)									
MI3.1	Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features and diagnostic modalities of these agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI3.2	Identify the common etiologic agents of diarrhea and dysentery	S	SH	Y	DOAP session	Skill assessment		General Medicine, Paediatrics	
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course and the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.4	Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness	S	KH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI3.5	Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology
MI3.6	Describe the etio-pathogenesis of Acid peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.7	Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis and prevention of viral hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI3.8	Choose the appropriate laboratory test in the diagnosis of viral hepatitis with emphasis on viral markers	K	KH	Y	Small group discussion, Case discussion	Written/ Viva voce/ OSPE		General Medicine	Pathology
Topic: Musculoskeletal system skin and soft tissue infections Number of competencies: (3) Number of procedures that require certification : (NIL)									
MI4.1	Enumerate the microbial agents causing anaerobic infections. Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of anaerobic infections	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
MI4.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections	K	KH	Y	Lecture	Written/ Viva voce		Orthopaedics	
MI4.3	Describe the etio-pathogenesis of infections of skin and soft tissue and discuss the clinical course and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy, General Surgery	
Topic: Central Nervous System infections Number of competencies: (3) Number of procedures that require certification : (NIL)									
MI5.1	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI5.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI5.3	Identify the microbial agents causing meningitis	S	SH	Y	DOAP session	Skill assessment		General Medicine, Pediatrics	
Topic: Respiratory tract infections Number of competencies: (3) Number of procedures that require certification : (02)									
MI6.1	Describe the etio-pathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI6.2	Identify the common etiologic agents of upper respiratory tract infections (Gram Stain)	S	P	Y	DOAP session	Skill assessment	3	General Medicine	
MI6.3	Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain)	S	P	Y	DOAP session	Skill assessment	3	General Medicine	
Topic: Genitourinary & Sexually transmitted infections Number of competencies: (3) Number of procedures that require certification : (NIL)									
MI7.1	Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
MI7.2	Describe the etio-pathogenesis and discuss the laboratory diagnosis of sexually transmitted infections. Recommend preventive measures	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy, Obstetrics & Gynaecology	
MI7.3	Describe the etio-pathogenesis, clinical features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Zoonotic diseases and miscellaneous Number of competencies: (16) Number of procedures that require certification : (01)									
MI8.1	Enumerate the microbial agents and their vectors causing Zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course, laboratory diagnosis and prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
MI8.2	Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Pathology
MI8.3	Describe the role of oncogenic viruses in the evolution of virus associated malignancy	K	KH	Y	Lecture	Written		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI8.4	Describe the etiologic agents of emerging Infectious diseases. Discuss the clinical course and diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
MI8.5	Define Healthcare Associated Infections (HAI) and enumerate the types. Discuss the factors that contribute to the development of HAI and the methods for prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
MI8.6	Describe the basics of Infection control	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Community Medicine
MI8.7	Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)	S	P	Y	DOAP session	Skill assessment	3 each in (Hand hygiene & PPE)	General Surgery	Community Medicine
MI8.8	Describe the methods used and significance of assessing the microbial contamination of food, water and air	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
MI8.9	Discuss the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing infectious diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
MI8.10	Demonstrate the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing Infectious diseases	S	SH	Y	DOAP session	Skill assessment			
MI8.11	Demonstrate respect for patient samples sent to the laboratory for performance of laboratory tests in the detection of microbial agents causing Infectious diseases	A	SH	Y	DOAP session	Skill assessment			
MI8.12	Discuss confidentiality pertaining to patient identity in laboratory results	A	KH	Y	Lecture, Small group discussion	Viva voce			
MI8.13	Choose the appropriate laboratory test in the diagnosis of the infectious disease	K	KH	Y	Small group discussions, Case discussion	Written/ Viva voce/ OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI8.14	Demonstrate confidentiality pertaining to patient identity in laboratory results	A	SH	Y	DOAP session	Skill assessment		AETCOM	
MI8.15	Choose and Interpret the results of the laboratory tests used in diagnosis of the infectious diseases	K/S	SH	Y	Small group discussion, Case discussion	Written/ Viva voce/ OSPE			
MI8.16	Describe the National Health Programs in the prevention of common infectious disease (for information purpose only as taught in CM)	K	K	Y	Lecture	Written/ Viva voce			Community Medicine
	*causative agents of Infectious diseases are inclusive of bacterial, viral, parasites and fungal agents causing various clinical conditions.								
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform. Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation								
Integration									
Biochemistry									
BI10.5	Describe antigens and concepts involved in vaccine development.	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
Pathology									
PA7.5	Describe the immunology and the immune response to cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.1	Describe the principles and mechanisms involved in immunity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
PA9.2	Describe the mechanism of hypersensitivity reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PA9.3	Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.6	Define and describe the pathogenesis and pathology of HIV and AIDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.1	Define and describe the pathogenesis and pathology of malaria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.2	Define and describe the pathogenesis and pathology of cysticercosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.3	Define and describe the pathogenesis and pathology of leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA22.5	Enumerate and describe infections transmitted by blood transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA26.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive Airway Disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA26.4	Define and describe the etiology, types, pathogenesis, stages, morphology, microscopic appearance and complications of tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PA27.4	Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.6	Describe the etiology, pathophysiology, pathology, gross and microscopic, features diagnosis and complications of infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.10	Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopaedics	Microbiology
PA35.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA35.3	Identify the etiology of meningitis based on given CSF parameters	S	P	Y	DOAP session	Skill Assessment	1	General Medicine	Microbiology
Pharmacology									
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics	Microbiology
PH1.45	Describe the drugs used in MDR and XDR Tuberculosis	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	Microbiology
PH1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	Microbiology
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	K	KH	Y	Lecture	Written/Viva voce			Microbiology
Community Medicine									
CM3.3	Describe the aetiology and basis of water borne diseases/ jaundice/hepatitis/ diarrheal diseases	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Microbiology, General Medicine, Pediatrics	
CM3.6	Describe the role of vectors in the causation of diseases. Also discuss National Vector Borne disease Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
CM3.7	Identify and describe the identifying features and life cycles of vectors of Public Health importance and their control measures	S	SH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Microbiology	
CM5.7	Describe food hygiene	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
CM7.7	Describe and demonstrate the steps in the Investigation of an epidemic of communicable disease and describe the principles of control measures	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	Microbiology
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology, Pathology
CM14.1	Define and classify hospital waste	K	KH	Y	Lecture, Small group discussion, visit to hospital	Written/ Viva voce			Microbiology
CM14.2	Describe various methods of treatment of hospital waste	K	KH	Y	Lecture, Small group discussion, visit to hospital	Written/ Viva voce			Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
CM14.3	Describe laws related to hospital waste management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
Dermatology, Venereology & Leprosy									
DR6.1	Describe the etiology pathogenesis and diagnostic features of pediculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR7.1	Describe the etiology microbiology pathogenesis and clinical presentations and diagnostic features of dermatophytes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR7.2	Identify candida species in fungal scrapings and KOH mount	S	SH	Y	DOAP session	Skill assessment			Microbiology
DR7.3	Describe the pharmacology and action of antifungal (systemic and topical) agents. Enumerate side effects of antifungal therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology ,Pharmacology
DR8.1	Describe the etiology microbiology pathogenesis and clinical presentations and diagnostic features of common viral infections of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR9.1	Classify, describe the epidemiology, etiology, microbiology, pathogenesis and clinical presentations and diagnostic features of Leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology, Community Medicine
DR10.1	Identify and classify syphilis based on the presentation and clinical manifestations	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.2	Identify spirochete in a dark ground microscopy	S	SH	Y	DOAP session	Skill assessment			Microbiology
DR10.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for syphilis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
DR10.6	Describe the etiology, diagnostic and clinical features of non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
DR10.7	Identify and differentiate based on the clinical features non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.8	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology
DR11.1	Describe the etiology, pathogenesis and clinical features of the dermatologic manifestations of HIV and its complications including opportunistic infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
DR11.2	Identify and distinguish the dermatologic manifestations of HIV its complications, opportunistic infections and adverse reactions	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR11.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology Microbiology
DR12.7	Identify and distinguish fixed drug eruptions and Steven Johnson syndrome from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Pathology, Microbiology
DR14.1	Describe the etiology, pathogenesis and clinical precipitating features and classification of Urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology, Pathology
DR15.2	Identify staphylococcus on a gram stain	S	SH	Y	Bedside clinic	Skill assessment			Microbiology
DR15.3	Enumerate the indications and describe the pharmacology, indications and adverse reactions of topical and systemic drugs used in treatment of pyoderma	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	Microbiology, Pharmacology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Dentistry									
DE1.2	Discuss the role of causative microorganisms in the aetio-pathogenesis of dental caries	K	KH	Y	Lecture, Small group discussion	Viva voce		Microbiology	
DE1.4	Discuss the role of dental caries as a focus of sepsis	K	KH	Y	Lecture, Small group discussion	Viva voce		Microbiology, General Medicine	
General Medicine									
IM1.3	Describe and discuss the aetiology, microbiology, pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.9	Describe and discuss the clinical presentation and features, diagnosis, recognition and management of acute rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
IM1.22	Assist and demonstrate the proper technique in collecting specimen for blood culture	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM1.27	Describe and discuss the role of penicillin prophylaxis in the prevention of rheumatic heart disease	K	KH	Y	Bedside clinic, Small group discussion	Written		Microbiology, Pharmacology	
IM3.1	Define, discuss, describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM3.2	Discuss and describe the aetiology of various kinds of pneumonia and their microbiology depending on the setting and immune status of the host	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Microbiology	
IM3.3	Discuss and describe the pathogenesis, presentation, natural history and complications of pneumonia	K	KH	Y	Lecture , Small group discussion	short note/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM3.7	Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum gram stain, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing and ABG	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	
IM3.10	Demonstrate the correct technique in a mannequin and interpret results of a blood culture	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM3.11	Describe and enumerate the indications for further testing including HRCT, Viral cultures, PCR and specialised testing	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	
IM3.12	Select, describe and prescribe based on the most likely aetiology, an appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.13	Select, describe and prescribe based on culture and sensitivity appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum.	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.14	Perform and interpret a sputum gram stain and AFB	S	P	Y	DOAP session	Skill assessment		Microbiology	
IM3.19	Discuss, describe and enumerate the indications and communicate to patients on pneumococcal and influenza vaccines	S/C	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
IM4.1	Describe and discuss the febrile response and the influence of host immune status, risk factors and co-morbidities on the febrile response	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.2	Describe and discuss the influence of special populations on the febrile response including: the elderly, immune suppression, malignancy and neutropenia, HIV and travel	K	K	Y	Lecture, Small group discussion	Written		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM4.3	Discuss and describe the common causes, pathophysiology and manifestations of fever in various regions in India including bacterial, parasitic and viral causes (e.g. Dengue, Chikungunya, Typhus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM4.4	Describe and discuss the pathophysiology and manifestations of inflammatory causes of fever	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.5	Describe and discuss the pathophysiology and manifestations of malignant causes of fever including hematologic and lymph node malignancies	K	KH	Y	Lecture, Small group discussion	Written		Pathology, Microbiology	
IM4.6	Discuss and describe the pathophysiology and manifestations of malaria	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.8	Discuss and describe the pathophysiology, aetiology and clinical manifestations of fever of unknown origin (FUO) including in a normal host, neutropenic host, nosocomial host and a host with HIV disease	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.9	Elicit document and present a medical history that helps delineate the aetiology of fever that includes the evolution and pattern of fever, associated symptoms, immune status, comorbidities, risk factors, exposure through occupation, travel and environment and medication use	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Microbiology	
IM4.12	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bedside clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
IM4.13	Perform and interpret a sputum gram stain	S	SH	Y	DOAP session	Log book documentation		Microbiology	
IM4.14	Perform and interpret a sputum AFB	S	SH	Y	DOAP session	Log book documentation		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM4.15	Perform and interpret a malarial smear	S	SH	Y	DOAP session	Log book documentation/ Skill assessment		Microbiology	
IM4.19	Assist in the collection of blood and wound cultures	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.20	Interpret a PPD (Mantoux)	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.23	Prescribe drugs for malaria based on the species identified, prevalence of drug resistance and national programs	S	SH	Y	Small group discussion	Skill assessment		Microbiology, Pharmacology	
IM4.26	Counsel the patient on malarial prevention	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	
IM5.4	Describe and discuss the epidemiology, microbiology, immunology and clinical evolution of infective (viral) hepatitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM5.14	Outline a diagnostic approach to liver disease based on hyperbilirubinemia, liver function changes and hepatitis serology	S	SH	Y	Bedside clinic, Small group discussion	Viva voce/ Written		Pathology, Microbiology	
IM5.17	Enumerate the indications precautions and counsel patients on vaccination for hepatitis	K/C	SH	Y	written Small group discussion	Written/ Viva voce		Microbiology	
IM6.1	Describe and discuss the symptoms and signs of acute HIV seroconversion	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.2	Define and classify HIV AIDS based on the CDC criteria	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.3	Describe and discuss the relationship between CDC count and the risk of opportunistic infections	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.4	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related opportunistic infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM6.10	Choose and interpret appropriate diagnostic tests to diagnose and classify the severity of HIV-AIDS including specific tests of HIV, CDC	K	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Skill assessment		Pathology, Microbiology	
IM6.13	Describe and enumerate the indications and side effects of drugs for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM6.14	Perform and interpret a gram stain of the sputum	S	P	Y	DOAP session	Skill assessment		Microbiology	
IM6.17	Describe and discuss the principles of HAART, the classes of antiretroviral used, adverse reactions and interactions	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.18	Describe and discuss the principles and regimens used in post exposure prophylaxis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.19	Enumerate the indications of and discuss about prophylactic drugs used to prevent HIV related opportunistic infections	K/C	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM13.3	Describe the relationship between infection and cancers	K	K	Y	Lecture, Small group discussion	Short notes/ Viva voce		Pathology, Microbiology	General Surgery
IM15.15	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM16.1	Describe and discuss the aetiology of acute and chronic diarrhea including infectious and non-infectious causes	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
IM6.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM16.8	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, and stool examination	S	SH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce		Microbiology, Pathology	
IM16.9	Identify common parasitic causes of diarrhea under the microscope in a stool specimen	S	SH	Y	DOAP session	Skill assessment		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM16.10	Identify Vibrio cholera in a hanging drop specimen	S	SH	Y	DOAP session	Skill Assessment		Microbiology	
IM16.11	Enumerate the indications for stool cultures and blood cultures in patients with acute diarrhea	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Microbiology	
IM16.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for parasitic causes of diarrhea	K	K	Y	Lectures, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM17.7	Enumerate the indications and describe the findings in the CSF in patients with meningitis	K	K	Y	Small group discussion, Bedside clinic	Skill Assessment		Microbiology, Pathology	
IM17.8	Demonstrate in a mannequin or equivalent the correct technique for performing a lumbar puncture	S	SH	Y	DOAP session	Skill assessment		Microbiology, Pathology	
IM17.9	Interpret the CSF findings when presented with various parameters of CSF fluid analysis	S	SH	Y	Small group discussion, Bedside clinic	Skill assessment		Microbiology, Pathology	
IM25.1	Describe and discuss the response and the influence of host immune status, risk factors and comorbidities on zoonotic disease (eg. Leptospirosis, Rabies) and non febrile infectious disease (eg. Tetanus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.2	Describe and discuss the common causes pathophysiology and manifestations of these diseases	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.3	Describe and discuss the pathophysiology and manifestations of these diseases	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM25.9	Assist in the collection of blood and other specimen cultures	S	SH	Y	DOAP session	Log book documentation		Microbiology	
IM25.11	Develop an appropriate empiric treatment plan based on the patient's clinical and immune status pending definitive diagnosis	C	SH	Y	DOAP session	Skill assessment		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Pediatrics									
PE19.1	Explain the components of the Universal immunization Program and the sub National Immunization Programs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.3	Vaccine description with regard to classification of vaccines, strain used, dose, route, schedule, risks, benefits and side effects, indications and contraindications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, preterm, organ transplants, those who received blood and blood products, splenectomised children, adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE21.1	Enumerate the etio-pathogenesis clinical features, complications and management of Urinary Tract infection in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE24.1	Discuss the etio-pathogenesis, classification, clinical presentation and management of diarrheal diseases in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE24.2	Discuss the classification and clinical presentation of various types of diarrheal dehydration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE24.5	Discuss the role of antibiotics, antispasmodics, anti-secretory drugs, probiotics, anti- emetics in acute diarrheal diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE24.6	Discuss the causes, clinical presentation and management of persistent diarrhoea in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE24.8	Discuss the causes, clinical presentation and management of dysentery in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE24.12	Perform and interpret stool examination including Hanging Drop	S	P	N	Bed side clinics, Skills lab	log book	2	Microbiology	
PE26.1	Discuss the etio-pathogenesis, clinical features and management of acute hepatitis in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.2	Discuss the etio-pathogenesis, clinical features and management of Fulminant Hepatic Failure in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.3	Discuss the etio-pathogenesis, clinical features and management of chronic liver diseases in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.12	Discuss the prevention of Hep B infection – Universal precautions and Immunisation	K	KH	Y	Lecture, Small group discussion activity	Written/ Viva voce		Microbiology	
PE30.1	Discuss the etio-pathogenesis, clinical features, complications, management and prevention of meningitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.2	Distinguish bacterial, viral and tuberculous meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.13	Discuss the etio-pathogenesis, clinical features, management and prevention of Poliomyelitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.21	Interpret and explain the findings in a CSF analysis	S	SH	Y	Small group discussion	Log book		Microbiology	Respiratory Medicine
PE34.1	Discuss the epidemiology, clinical features, clinical types, complications of Tuberculosis in Children and Adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE34.2	Discuss the various diagnostic tools for childhood tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine Pharmacology	Respiratory Medicine
PE34.6	Identify a BCG scar	S	P	Y	Bed side clinics, Skills lab	Skill Assessment	3	Microbiology	Respiratory Medicine
PE34.7	Interpret a Mantoux test	S	P	Y	Bed side clinics Skills lab	Skill assessment	3	Microbiology	Respiratory Medicine
PE34.9	Interpret blood tests in the context of laboratory evidence for tuberculosis	S	SH	N	Bed side clinics, Small group discussion	Log book		Microbiology	Respiratory Medicine
PE34.10	Discuss the various samples for demonstrating the organism eg Gastric Aspirate, Sputum, CSF, FNAC	K	KH	Y	Bed side clinics, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.11	Perform AFB staining	S	P	Y	DOAP session	Log book/journal	3	Microbiology	Respiratory Medicine
PE34.12	Enumerate the indications and Discuss the limitation of methods of culturing M.Tuberculi	K	KH	Y	Small group discussion	Written/ Viva voce		Microbiology	
General Surgery									
SU6.1	Define and describe the aetiology and pathogenesis of surgical infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU13.1	Describe the immunological basis of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU13.2	Discuss the Principles of immunosuppressive therapy.Enumerate Indications, describe surgical principles, management of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
SU14.1	Describe aseptic techniques, sterilization and disinfection	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU15.1	Describe Classification of hospital waste and appropriate methods of disposal	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU29.3	Describe the Clinical features, Investigations and principles of management of urinary tract infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
Orthopaedics									
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/SH	Y	Lecture, Small group discussion, Video assisted lecture	Written/ Viva voce/ OSCE		Pathology, Microbiology	
Respiratory Medicine									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/ P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
CT1.2	Describe and discuss the microbiology of tubercle bacillus, mode of transmission, pathogenesis, clinical evolution and natural history of pulmonary and extra pulmonary forms (including lymph node, bone and CNS).	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
CT1.3	Discuss and describe the impact of confection with HIV and other co-morbid conditions like diabetes on the natural history of tuberculosis	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
CT1.4	Describe the epidemiology, the predisposing factors and microbial and therapeutic factors that determine resistance to drugs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Pharmacology	
CT1.7	Perform and interpret a PPD (Mantoux) and describe and discuss the indications and pitfalls of the test	S	P	Y	DOAP session	Maintenance of log book		Microbiology	
CT1.10	Perform and interpret an AFB stain	S	P	Y	DOAP session	Skill assessment	1	Microbiology	
CT1.12	Enumerate the indications for tests including: serology, special cultures and polymerase chain reaction and sensitivity testing	K	KH	Y	Small group discussion, Lecture	Short note/ Viva voce		Microbiology	
CT1.13	Describe and discuss the origins, indications, technique of administration, efficacy and complications of the BCG vaccine	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	

FORENSIC MEDICINE INCLUDING TOXICOLOGY (CODE: FM)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FORENSIC MEDICINE & TOXICOLOGY									
Topic: General Information		Number of competencies: (11)			Number of procedures that require certification: (NIL)				
FM1.1	Demonstrate knowledge of basics of Forensic Medicine like definitions of Forensic medicine, Clinical Forensic Medicine, Forensic Pathology, State Medicine, Legal Medicine and Medical Jurisprudence	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.2	Describe history of Forensic Medicine	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.3	Describe legal procedures including Criminal Procedure Code, Indian Penal Code, Indian Evidence Act, Civil and Criminal Cases, Inquest (Police Inquest and Magistrate's Inquest), Cognizable and Non-cognizable offences	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.4	Describe Courts in India and their powers: Supreme Court, High Court, Sessions court, Magistrate's Court, Labour Court, Family Court, Executive Magistrate Court and Juvenile Justice Board	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.5	Describe Court procedures including issue of Summons, conduct money, types of witnesses, recording of evidence oath, affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence & conduct of doctor in witness box	K	KH	N	Lecture, Small Group Discussion, Moot Court	Written/ Viva voce			
FM1.6	Describe Offenses in Court including Perjury; Court strictures vis-a-vis Medical Officer	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.7	Describe Dying Declaration & Dying Deposition	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.8	Describe the latest decisions/notifications/resolutions/circulars/standing orders related to medico-legal practice issued by Courts/Government authorities etc.	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially - maintenance of patient case records, discharge summary, prescribed registers to be maintained in Health Centres. - maintenance of medico-legal register like accident register. - documents of issuance of wound certificate - documents of issuance of drunkenness certificate. - documents of issuance of sickness and fitness certificate. - documents for issuance of death certificate. -documents of Medical Certification of Cause of Death - Form Number4 and 4A - documents for estimation of age by physical, dental and radiological examination and issuance of certificate	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Radiodiagnosis, General Surgery, General Medicine, Pediatrics	
FM1.10	Select appropriate cause of death in a particular scenario by referring ICD 10 code	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.11	Write a correct cause of death certificate as per ICD 10 document	S	SH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
Topic: Forensic Pathology Number of competencies: (35) Number of procedures that require certification : (NIL)									
FM2.1	Define, describe and discuss death and its types including somatic/clinical/cellular, molecular and brain-death, Cortical Death and Brainstem Death	K	KH	Y	Lecture/Small group discussion	Written/ Viva voce		Pathology	
FM2.2	Describe and discuss natural and unnatural deaths	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Pathology	
FM2.3	Describe and discuss issues related to sudden natural deaths	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Pathology	
FM2.4	Describe salient features of the Organ Transplantation and The Human Organ Transplant (Amendment) Act 2011 and discuss ethical issues regarding organ donation	K	KH	Y	Lecture/Small group discussion	Written/ Viva voce		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.5	Discuss moment of death, modes of death - coma, asphyxia and syncope	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Psychiatry, Pathology	
FM2.6	Discuss presumption of death and survivorship	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
FM2.7	Describe and discuss suspended animation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM2.8	Describe and discuss postmortem changes including signs of death, cooling of body, post-mortem lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.9	Describe putrefaction, mummification, adipocere and maceration	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.10	Discuss estimation of time since death	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.11	Describe and discuss autopsy procedures including post-mortem examination, different types of autopsies, aims and objectives of post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		Pathology	
FM2.12	Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		Pathology	
FM2.13	Describe and discuss obscure autopsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
FM2.14	Describe and discuss examination of clothing, preservation of viscera on post-mortem examination for chemical analysis and other medico-legal purposes, post-mortem artefacts	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM 2.15	Describe special protocols for conduction of medico-legal autopsies in cases of death in custody or following violation of human rights as per National Human Rights Commission Guidelines	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.16	Describe and discuss examination of mutilated bodies or fragments, charred bones and bundle of bones	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ OSPE			
FM2.17	Describe and discuss exhumation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM2.18	Crime Scene Investigation:- Describe and discuss the objectives of crime scene visit, the duties & responsibilities of doctors on crime scene and the reconstruction of sequence of events after crime scene investigation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM2.19	Investigation of anaesthetic, operative deaths: Describe and discuss special protocols for conduction of autopsy and for collection, preservation and dispatch of related material evidences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Anesthesiology, General Surgery	
FM2.20	Mechanical asphyxia: Define, classify and describe asphyxia and medico-legal interpretation of post-mortem findings in asphyxial deaths	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.21	Mechanical asphyxia: Describe and discuss different types of hanging and strangulation including clinical findings, causes of death, post-mortem findings and medico-legal aspects of death due to hanging and strangulation including examination, preservation and dispatch of ligature material	K	KH	Y	Lecture/Small group discussion, Autopsy DOAP session	Written/ Viva voce/ OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.22	Mechanical asphyxia: Describe and discuss patho-physiology, clinical features, post-mortem findings and medico-legal aspects of traumatic asphyxia, obstruction of nose & mouth, suffocation and sexual asphyxia	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.23	Describe and discuss types, patho-physiology, clinical features, post-mortem findings and medico-legal aspects of drowning, diatom test and, gettler test.	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.24	Thermal deaths: Describe the clinical features, post-mortem finding and medicolegal aspects of injuries due to physical agents like heat (heat-hyper-pyrexia, heat stroke, sun stroke, heat exhaustion/prostration, heat cramps [miner's cramp] or cold (systemic and localized hypothermia, frostbite, trench foot, immersion foot)	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce			
FM2.25	Describe types of injuries, clinical features, patho-physiology, post-mortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		General Surgery	
FM2.26	Describe and discuss clinical features, post-mortem findings and medico-legal aspects of death due to starvation and neglect	K	KH	Y	Lecture/Small group discussion	Written/ Viva voce			
FM2.27	Define and discuss infanticide, foeticide and stillbirth	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
FM2.28	Describe and discuss signs of intrauterine death, signs of live birth, viability of foetus, age determination of foetus, DOAP session of ossification centres, Hydrostatic test, Sudden Infants Death syndrome and Munchausen's syndrome by proxy	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/Viva voce / OSCE		Pediatrics, Human Anatomy	
FM2.29	Demonstrate respect to the directions of courts, while appearing as witness for recording of evidence under oath or affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence	A and C	SH	Y	Lecture, Small group discussion, Moot Court, Court visits, Role Play	Role Play during internal assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.30	Have knowledge/awareness of latest decisions/notifications/resolutions/circulars/standing orders related to medico-legal practice issued by Courts/Government authorities etc	A	K	Y	Lecture/Small group discussion	Written/ Viva voce			
FM2.31	Demonstrate ability to work in a team for conduction of medico-legal autopsies in cases of death following alleged negligence medical dowry death, death in custody or following violation of human rights as per National Human Rights Commission Guidelines on exhumation	A	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.32	Demonstrate ability to exchange information by verbal, or nonverbal communication to the peers, family members, law enforcing agency and judiciary	A and C	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		AETCOM	
FM2.33	Demonstrate ability to use local resources whenever required like in mass disaster situations	A and C	KH	Y	Lecture/Small group discussion	Written/ Viva voce		Community Medicine	
FM2.34	Demonstrate ability to use local resources whenever required like in mass disaster situations	A and C	KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Medicine, AETCOM	
FM2.35	Demonstrate professionalism while conducting autopsy in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	A and C	KH/SH		Lecture, small group discussions, DOAP session	Written/ Viva voce/ OSPE		AETCOM	
Topic: Clinical Forensic Medicine Number of competencies:(33) Number of procedures that require certification:(NIL)									
FM3.1	IDENTIFICATION Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones-ossification centres, medico-legal aspects of age	K	KH	Y	Lecture, Small group discussion, Bedside clinic, DOAP session	Written/Viva voce/ skill assessment		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.2	IDENTIFICATION Describe and discuss identification of criminals, unknown persons, dead bodies from the remains-hairs, fibers, teeth, anthropometry, dactylography, foot prints, scars, tattoos, poroscopy and superimposition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM3.3	Mechanical injuries and wounds: Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds and their medico-legal aspects	K	KH	Y	Lecture, Small group discussion Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		General Surgery	
FM3.4	Mechanical injuries and wounds: Define injury, assault & hurt. Describe IPC pertaining to injuries	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
FM3.5	Mechanical injuries and wounds: Describe accidental, suicidal and homicidal injuries. Describe simple, grievous and dangerous injuries. Describe ante-mortem and post-mortem injuries	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce			
FM3.6	Mechanical injuries and wounds: Describe healing of injury and fracture of bones with its medico-legal importance	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery	
FM3.7	Describe factors influencing infliction of injuries and healing, examination and certification of wounds and wound as a cause of death: Primary and Secondary	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	
FM3.8	Mechanical injuries and wounds: Describe and discuss different types of weapons including dangerous weapons and their examination	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	
FM3.9	Firearm injuries: Describe different types of firearms including structure and components. Along with description of ammunition propellant charge and mechanism of fire-arms, different types of cartridges and bullets and various terminology in relation of firearm – caliber, range, choking	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.10	Firearm injuries: Describe and discuss wound ballistics-different types of firearm injuries, blast injuries and their interpretation, preservation and dispatch of trace evidences in cases of firearm and blast injuries, various tests related to confirmation of use of firearms	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/Viva voce/ OSCE		General Surgery, Orthopaedics	
FM3.11	Regional Injuries: Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest, abdomen, limbs, genital organs, spinal cord and skeleton	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic or autopsy, DOAP session	Written/ Viva voce/ OSCE/OSPE		General Surgery, Orthopaedics	
FM3.12	Regional Injuries Describe and discuss injuries related to fall from height and vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic or autopsy, DOAP session	Written/ Viva voce/ OSCE/OSPE		General Surgery, Orthopaedics	
FM3.13	Describe different types of sexual offences. Describe various sections of IPC regarding rape including definition of rape (Section 375 IPC), Punishment for Rape (Section 376 IPC) and recent amendments notified till date	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE/OSPE		Obstetrics & Gynaecology	
FM3.14	SEXUAL OFFENCES Describe and discuss the examination of the victim of an alleged case of rape, and the preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Obstetrics & Gynaecology, Psychiatry	
FM3.15	SEXUAL OFFENCES Describe and discuss examination of accused and victim of sodomy, preparation of report, framing of opinion, preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Obstetrics & Gynaecology, Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.16	SEXUAL OFFENCES Describe and discuss adultery and unnatural sexual offences- sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault and preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	
FM3.17	Describe and discuss the sexual perversions fetishism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	
FM3.18	Describe anatomy of male and female genitalia, hymen and its types. Discuss the medico-legal importance of hymen. Define virginity, defloration, legitimacy and its medicolegal importance	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.19	Discuss the medicolegal aspects of pregnancy and delivery, signs of pregnancy, precipitate labour superfoetation, superfecundation and signs of recent and remote delivery in living and dead	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.20	Discuss disputed paternity and maternity	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.21	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC&PNDT) - Prohibition of Sex Selection Act 2003 and Domestic Violence Act 2005	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, AETCOM	
FM3.22	Define and discuss impotence, sterility, frigidity, sexual dysfunction, premature ejaculation. Discuss the causes of impotence and sterility in male and female	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Medicine	
FM3.23	Discuss Sterilization of male and female, artificial insemination, Test Tube Baby, surrogate mother, hormonal replacement therapy with respect to appropriate national and state laws	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.24	Discuss the relative importance of surgical methods of contraception (vasectomy and tubectomy) as methods of contraception in the National Family Planning Programme	K	K/KH	N	Lecture, Small group discussion	Written		Obstetrics & Gynaecology	
FM3.25	Discuss the major results of the National Family Health Survey	K	K/KH	N	Lecture	Written		Obstetrics & Gynaecology	
FM3.26	Discuss the national Guidelines for accreditation, supervision & regulation of ART Clinics in India	K	K/KH	Y	Lecture, Small group discussion	Written		Obstetrics & Gynaecology	
FM3.27	Define, classify and discuss abortion, methods of procuring MTP and criminal abortion and complication of abortion. MTP Act 1971	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, AETCOM	
FM3.28	Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Pathology	
FM3.29	Describe and discuss child abuse and battered baby syndrome	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
FM3.30	Describe and discuss issues relating to torture, identification of injuries caused by torture and its sequelae, management of torture survivors	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM3.31	Torture and Human rights Describe and discuss guidelines and Protocols of National Human Rights Commission regarding torture	K	K/KH	N	Lecture/Small group discussion	Written/ Viva voce			
FM3.32	Demonstrate the professionalism while preparing reports in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	A and C	SH	Y	Lecture, Small group discussion	OSPE/Viva voce		AETCOM	
FM3.33	Should be able to demonstrate the professionalism while dealing with victims of torture and human right violations, sexual assaults- psychological consultation, rehabilitation	A and C	K/KH/S H	Y	Lecture/Small group discussion	Written/ Viva voce		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Medical Jurisprudence (Medical Law and ethics)		Number of competencies: (30)			Number of procedures that require certification : (NIL)				
FM4.1	Describe Medical Ethics and explain its historical emergence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.2	Describe the Code of Medical Ethics 2002 conduct, Etiquette and Ethics in medical practice and unethical practices & the dichotomy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.3	Describe the functions and role of Medical Council of India and State Medical Councils	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.4	Describe the Indian Medical Register	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.5	Rights/privileges of a medical practitioner, penal erasure, infamous conduct, disciplinary Committee, disciplinary procedures, warning notice and penal erasure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.6	Describe the Laws in Relation to medical practice and the duties of a medical practitioner towards patients and society	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.7	Describe and discuss the ethics related to HIV patients	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.8	Describe the Consumer Protection Act-1986 (Medical Indemnity Insurance, Civil Litigations and Compensations), Workman's Compensation Act & ESI Act	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.9	Describe the medico - legal issues in relation to family violence, violation of human rights, NHRC and doctors	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.10	Describe communication between doctors, public and media	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.11	Describe and discuss euthanasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM4.12	Discuss legal and ethical issues in relation to stem cell research	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.13	Describe social aspects of Medico-legal cases with respect to victims of assault, rape, attempted suicide, homicide, domestic violence, dowry- related cases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.14	Describe & discuss the challenges in managing medico-legal cases including development of skills in relationship management – Human behaviour, communication skills, conflict resolution techniques	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.15	Describe the principles of handling pressure – definition, types, causes, sources and skills for managing the pressure while dealing with medico-legal cases by the doctor	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.16	Describe and discuss Bioethics	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.17	Describe and discuss ethical Principles: Respect for autonomy, non-maleficence, beneficence & justice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.18	Describe and discuss medical negligence including civil and criminal negligence, contributory negligence, corporate negligence, vicarious liability, Res Ipsa Loquitor, prevention of medical negligence and defenses in medical negligence litigations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.19	Define Consent. Describe different types of consent and ingredients of informed consent. Describe the rules of consent and importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.20	Describe therapeutic privilege, Malingering, Therapeutic Misadventure, Professional Secrecy, Human Experimentation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM4.21	Describe Products liability and Medical Indemnity Insurance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.22	Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.23	Describe the modified Declaration of Geneva and its relevance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.24	Enumerate rights, privileges and duties of a Registered Medical Practitioner. Discuss doctor- patient relationship: professional secrecy and privileged communication	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.25	Clinical research & Ethics Discuss human experimentation including clinical trials	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.26	Discuss the constitution and functions of ethical committees	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.27	Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.28	Demonstrate respect to laws relating to medical practice and Ethical code of conduct prescribed by Medical Council of India and rules and regulations prescribed by it from time to time	A and C	SH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.29	Demonstrate ability to communicate appropriately with media, public and doctors	A and C	KH/SH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.30	Demonstrate ability to conduct research in pursuance to guidelines or research ethics	A and C	KH/SH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
Topic: Forensic Psychiatry Number of competencies: (06) Number of procedures that require certification: (NIL)									
FM5.1	Classify common mental illnesses including post-traumatic stress disorder (PTSD)	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM5.2	Define, classify and describe delusions, hallucinations, illusion, lucid interval and obsessions with exemplification	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.3	Describe Civil and criminal responsibilities of a mentally ill person	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.4	Differentiate between true insanity from feigned insanity	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.5	Describe & discuss Delirium tremens	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry, General Medicine	
FM5.6	Describe the Indian Mental Health Act, 1987 with special reference to admission, care and discharge of a mentally ill person	K	K/KH	N	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
Topic: Forensic Laboratory investigation in medical legal practice Number of competencies: (03) Number of procedures that require certification: (NIL)									
FM6.1	Describe different types of specimen and tissues to be collected both in the living and dead: Body fluids (blood, urine, semen, faeces saliva), Skin, Nails, tooth pulp, vaginal smear, viscera, skull, specimen for histo-pathological examination, blood grouping, HLA Typing and DNA Fingerprinting. Describe Locard's Exchange Principle	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
FM6.2	Describe the methods of sample collection, preservation, labelling, dispatch, and interpretation of reports	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM6.3	Demonstrate professionalism while sending the biological or trace evidences to Forensic Science laboratory, specifying the required tests to be carried out, objectives of preservation of evidences sent for examination, personal discussions on interpretation of findings	A and C	KH/SH	Y	Lecture, Small group discussions, DOAP sessions	Viva voce / OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Emerging technologies in Forensic Medicine Number of competencies: (01) Number of procedures that require certification:(NIL)									
FM7.1	Enumerate the indications and describe the principles and appropriate use for: - DNA profiling Facial reconstruction - Polygraph (Lie Detector) - Narcoanalysis, - Brain Mapping, - Digital autopsy, - Virtual Autopsy, - Imaging technologies	K	K/KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Toxicology: General Toxicology Number of competencies: (10) Number of procedures that require certification: (NIL)									
FM8.1	Describe the history of Toxicology	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.2	Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.3	Describe the various types of poisons, Toxicokinetics, and Toxicodynamics and diagnosis of poisoning in living and dead	K	K/KH	Y	Lecture, Small group discussion	Written/viva voce		Pharmacology	
FM8.4	Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.5	Describe Medico-legal autopsy in cases of poisoning including preservation and dispatch of viscera for chemical analysis	K	K/KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		Pharmacology	
FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM8.7	Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM8.9	Describe the procedure of intimation of suspicious cases or actual cases of foul play to the police, maintenance of records, preservation and despatch of relevant samples for laboratory analysis.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM8.10	Describe the general principles of Analytical Toxicology and give a brief description of analytical methods available for toxicological analysis: Chromatography – Thin Layer Chromatography, Gas Chromatography, Liquid Chromatography and Atomic Absorption Spectroscopy	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Toxicology : Chemical Toxicology Number of competencies: (06) Number of procedures that require certification : (NIL)									
FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric, and hydrochloric acids; Organic- Carbolic Acid (phenol), Oxalic and acetylsalicylic acids	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.2	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Phosphorus, Iodine, Barium	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM9.3	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.4	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.5	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Organophosphates, Carbamates, Organochlorines, Pyrethroids, Paraquat, Aluminium and Zinc phosphide	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.6	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ammonia, carbon monoxide, hydrogen cyanide & derivatives, methyl isocyanate, tear (riot control) gases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
Topic: Toxicology : Pharmaceutical Toxicology Number of competencies: (01) Number of procedures that require certification : (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepins phenytoin, lithium, haloperidol, neuroleptics, tricyclics iv .Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis vi.Gastro-Intestinal and Endocrinal Drugs – Insulin	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
Topic: Toxicology : Biotoxicology Number of competencies: (01) Number of procedures that require certification : (NIL)									
FM11.1	Describe features and management of Snake bite, scorpion sting, bee and wasp sting and spider bite	K	K/KH	Y	Lecture, Small group discussion, Autopsy	Written/ Viva voce		General Medicine	
Topic: Toxicology : Sociomedical Toxicology Number of competencies: (01) Number of procedures that require certification : (NIL)									
FM12.1	Describe features and management of abuse/poisoning with following camicals: Tobacco, cannabis, amphetamines, cocaine, hallucinogens, designer drugs & solvent	K	K/KH	Y	Lecture, Small group discussion, Autopsy	Written/ Viva voce		General Medicine	
Topic: Toxicology : Environmental Toxicology Number of competencies: (02) Number of procedures that require certification : (NIL)									
FM13.1	Describe toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
FM13.2	Describe medico-legal aspects of poisoning in Workman's Compensation Act	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Skills in Forensic Medicine & Toxicology Number of competencies: (22) Number of procedures that require certification: (NIL)									
FM14.1	Examine and prepare Medico-legal report of an injured person with different etiologies in a simulated/ supervised environment	S	SH/P	Y	Bedside clinic (ward/ casualty), Small group discussion	Log book/ Skill station/ Viva voce / OSCE			
FM14.2	Demonstrate the correct technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment	S	SH	Y	Bedside clinic (ward/casualty), Small Group discussion	Log book/ Skill station/ Viva voce / OSCE		General Medicine	
FM14.3	Assist and demonstrate the proper technique in collecting, preserving and dispatch of the exhibits in a suspected case of poisoning, along with clinical examination	S	SH	Y	Bedside clinic, Small Group discussion, DOAP session	Skill lab/ Viva voce		General Medicine	
FM14.4	Conduct and prepare report of estimation of age of a person for medico-legal and other purposes & prepare medico-legal report in a simulated/ supervised environment	S	KH	Y	Small group discussion, Demonstration	Log book/ Skill station/ Viva voce / OSCE			
FM14.5	Conduct & prepare post-mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment	S	KH	Y	Small group discussion, Autopsy, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.6	Demonstrate and interpret medico-legal aspects from examination of hair (human & animal) fibre, semen & other biological fluids	S	KH	Y	Small group discussion, Lecture	Log book/ Skill station/ Viva voce / OSCE			
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin	S	KH	Y	Small group discussion, Lecture	Log book/Skill station/Viva voce		Pathology, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & RH blood group of a person	S	SH	Y	Small group discussion, DOAP session	Log book/Skill station/Viva voce		Pathology, Physiology	
FM14.9	Demonstrate examination of & present an opinion after examination of skeletal remains in a simulated/ supervised environment	S	SH	Y	Small group discussion, DOAP session	Log book/Skill station/Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM14.10	Demonstrate ability to identify & prepare medicolegal inference from specimens obtained from various types of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of bone	S	KH	Y	Small group discussion, DOAP session	Log book/Skill station/ Viva voce/ OSPE			
FM14.11	To identify & describe weapons of medicolegal importance which are commonly used e.g. lathi, knife, kripa, axe, gadda, gupta, farsha, dagger, bhalla, razor & stick. Able to prepare report of the weapons brought by police and to give opinion regarding injuries present on the person as described in injury report/ PM report so as to connect weapon with the injuries. (Prepare injury report/ PM report must be provided to connect the weapon with the injuries)	S	KH	Y	Small group discussion, DOAP session	Log book/Skill station/ Viva voce/ OSPE			
FM14.12	Describe the contents and structure of bullet and cartridges used & to provide medico-legal interpretation from these	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/Viva voce			
FM14.13	To estimate the age of foetus by post-mortem examination	S	KH	Y	Small group discussion, DOAP session	Theory/ Clinical assessment/ Viva voce			
FM14.14	To examine & prepare report of an alleged accused in rape/unnatural sexual offence in a simulated/ supervised environment	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.15	To examine & prepare medico-legal report of a victim of sexual offence/unnatural sexual offence in a simulated/ supervised environment	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.16	To examine & prepare medico-legal report of drunk person in a simulated/ supervised environment	S	KH	Y	Small group discussion, Bed side clinic, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.17	To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	S	KH	Y	Small group discussion, DOAP session	Log book/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM14.18	To examine & prepare medico-legal report of a person in police, judicial custody or referred by Court of Law and violation of human rights as requirement of NHRC, who has been brought for medical examination	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.19	To identify & prepare medico-legal inference from histo-pathological slides of Myocardial Infarction, pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain haemorrhage, bone fracture, Pulmonary oedema, brain oedema, soot particles, diatoms & wound healing	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce			
FM14.20	To record and certify dying declaration in a simulated/ supervised environment	S	KH	Y	Small group discussion, Role Play, Bed side clinic DOAP session	Log book/ Skill station/ Viva voce /OSCE			
FM14.21	To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.	S	KH	Y	Small group discussion, Lecture	Log book/ Skill station/Viva voce			
FM14.22	To give expert medical/ medico-legal evidence in Court of law	S	KH	Y	Small group discussion, Lecture, DOAP session, role play, Court Visits	Log book/ Viva voce/OSCE			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform. Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation								
Integration									
Human Anatomy									
AN14.3	Describe the importance of ossification of lower end of femur & upper end of tibia	K	KH	Y	Lecture	Viva voce/Practicals		Forensic Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Pharmacology									
PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Forensic Medicine
PH5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs	K	KH	Y	Small group discussion	short note/Viva voce			Forensic Medicine
Radiodiagnosis									
RD1.13	Describe the components of the PC & PNDT act and its medicolegal implications	K	KH	Y	Lecture, Small group discussion			Obstetrics & Gynaecology, Forensic Medicine	
Psychiatry									
PS19.3	Describe and discuss the basic legal and ethical issues in psychiatry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine AETCOM	
General Medicine									
IM20.1	Enumerate the poisonous snakes of your area and describe the distinguishing marks of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM20.2	Describe, demonstrate in a volunteer or a mannequin and educate (to other health care workers / patients) the correct initial management of patient with a snake bite in the field	S	SH	Y	DOAP session	Skill assessment/ Written/ Viva voce		Forensic Medicine	
IM20.3	Describe the initial approach to the stabilisation of the patient who presents with snake bite	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine	
IM20.4	Elicit and document and present an appropriate history, the circumstance, time, kind of snake, evolution of symptoms in a patient with snake bite	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Forensic Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM21.2	Enumerate the common plant poisons seen in your area and describe their toxicology, clinical features, prognosis and specific approach to detoxification	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.3	Enumerate the common corrosives used in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.4	Enumerate the commonly observed drug overdose in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.5	Observe and describe the functions and role of a poison center in suspected poisoning	S	KH	Y	DOAP session	document in log book		Forensic Medicine, Pharmacology	
IM21.6	Describe the medico legal aspects of suspected suicidal or homicidal poisoning and demonstrate the correct procedure to write a medico legal report on a suspected poisoning	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Forensic Medicine, Pharmacology	
IM21.7	Counsel family members of a patient with suspected poisoning about the clinical and medico legal aspects with empathy	A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine, Pharmacology	
IM21.8	Enumerate the indications for psychiatric consultation and describe the precautions to be taken in a patient with suspected suicidal ideation / gesture	K	KH	Y	DOAP session	Skill assessment		Forensic Medicine, Psychiatry	
Obstetrics & Gynaecology									
OG1.3	Define and Discuss still birth and abortion	K	KH	Y	Lecture, Small group discussions	Short notes		Forensic Medicine	
OG9.2	Describe the steps and observe/ assist in the performance of an MTP evacuation	S	SH	Y	DOAP session, Bedside clinic	Viva voce		Forensic Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG20.1	Enumerate the indications and describe and discuss the legal aspects, indications, methods for first and second trimester MTP; complications and management of complications of medical termination of pregnancy	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Forensic Medicine	
OG20.2	In a simulated environment administer informed consent to a person wishing to undergo medical termination of pregnancy	S/A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine	
OG20.3	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC& PNDT) Act 1994 & its amendments	K	K/KH	Y	Lecture, Small group discussions	Written/ Viva voce		Forensic Medicine	
General Surgery									
SU8.1	Describe the principles of Ethics as it pertains to surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ skill assessment		Forensic Medicine, AETCOM	
SU8.2	Demonstrate Professionalism and empathy to the patient undergoing surgery	A/C	SH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Forensic Medicine, AETCOM	
SU8.3	Discuss Medico legal issues in surgical practice	A/C	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ skill assessment		Forensic Medicine, AETCOM	

List of contributing subject Experts

1. Human Anatomy

- Dr. Praveen R Singh, Professor & Head, Department of Anatomy, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Nachiket Shankar, Associate Professor, Department of Anatomy, St. John's Medical College & Hospital, Bangalore

2. Physiology

- Dr. Mario Vaz, Professor, Department of Physiology, St. John's Medical College & Hospital, Bangalore
- Dr. Jayashree Sengupta, Former Professor & Head, Department of Physiology, All India Institute of Medical Sciences, New Delhi.
- Dr Hasmukh D Shah, Professor & Head, Department of Physiology, Pramukhswami Medical College, Karamsad, Gujarat

3. Biochemistry

- Dr. Nibhriti Das, Professor, Department of Biochemistry, All India Institute of Medical Sciences, New Delhi
- Dr. S. P. Singh, Professor, Department of Biochemistry, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh
- Dr. Hitesh N Shah, Professor & Head, Department of Biochemistry, Pramukhswami Medical College, Karamsad, Gujarat

4. Pharmacology

- Dr. S. K. Maulik, Professor, Department of Pharmacology, All India Institute of Medical Sciences, New Delhi
- Dr. Vandana Roy, Professor, Department of Pharmacology, Maulana Azad Medical College, New Delhi

5. Pathology

- Dr. S. Datta Gupta, Professor, Department of Pathology, All India Institute of Medical Sciences, New Delhi
- Dr. Uma Chaturvedi, Professor, C-1303, Freedom Park Life, Sector- 57, Gurugram

6. Microbiology

- Dr. S. Geetalakshmi, Dean, Professor, Department of Microbiology, Stanley Medical College, Chennai, Tamil Nadu.
- Dr. Padma Srikanth, Professor, Department of Microbiology, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suman Singh, Professor, Department of Microbiology, Pramukhswami Medical College, Karamsad, Gujarat

7. Forensic Medicine & Toxicology

- Dr. Sanjeev Lalwani, Professor & Registrar (Academics), Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. T. D. Dogra, Former Director & Former Head, Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi; currently, Vice Chancellor, SGT University, Gurugram
- Col. Ravi Rautji, Professor & Head, Department of Forensic Medicine, Commanding Officer, Directorate General of Medical Services (Army), New Delhi
- Dr. S.D. Nanandkar, Professor & Head, Department of Forensic Medicine, Grant Government Medical College & Sir J.J. Group of Hospitals, Mumbai
- Dr. Indrajit L. Khandekar, In-charge CFMU and Associate Professor, Department of Forensic Medicine & Toxicology, MGIMS and Kasturba Hospital, Sewagram, Wardha.
- Dr. S. B. Punpale, Professor & Head, Department of Forensic Medicine, B. J. Medical College, Pune, Maharashtra

8. Community Medicine

- Dr. B. S. Garg, Professor & Head, Department of Community Medicine, Mahatama Gandhi Institute of Medical Sciences, Wardha, Sewagram, Maharashtra
- Dr. Umesh Kapil, Professor, Department of Community Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. Sanjay Zodpey, Director, Public Health Foundation of India, Isid Campus, 4 Institutional Area, Vasant Kunj, New Delhi
- Dr. Saudan Singh, Professor, Department of Community Medicine, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. Dinesh Kumar, Professor, Department of Community Medicine, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Pankaj B. Shah, Professor, Department of Community Medicine, Sri Ramachandra Medical College & Research Institute, Chennai.

9. General Medicine & Respiratory Medicine

- Dr. Krishna G. Seshadri, Visiting Professor, Endocrinology & Metabolism, Balaji Vidyapeeth, Puducherry
- Dr. M. K. Bhatnagar, Director Professor, Department of General Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Aparna Agarwal, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Anil Gurtoo, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi

10. Pediatrics

- Dr. Harish Chellani, Professor of Pediatrics, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. A. K. Dutta, Former Head, Kalawati Saran Children's Hospital, New Delhi

- Dr. S. Aneja, Director Professor & Head, Department of Pediatrics, Kalawati Saran Children's Hospital, New Delhi
- Dr. Latha Ravichandran, Professor, Deartment of Paediatrics, Sri Ramachandra Medical College & Research Institute, Chennai.

11. Psychiatry

- Dr. Rakesh Kumar Chadda, Department of Psychiatry, All India Institute of Medical Sciences, New Delhi
- Dr. N. M. Patil, Professor, Department of Psychiatry, Jawaharlal Nehru Medical College, Belagavi
- Dr. Rajesh Rastogi, Consultant & Head Department of Psychiatry, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi.
- Dr. Jagdish R Varma, Associate Professor, Department of Psychiatry, Pramukhswami Medical College, Karamsad, Gujarat

12. Dermatology, Venereology & Leprosy

- Dr. R. K. Gautam, Professor, Department of Dermatology, Venereology & Leprosy, Dr. Ram Manohar Lohia Hospital, New Delhi.
- Dr. Sujay Khandpur, Professor, Department of Dermatology, Venereology & Leprosy, All India Institute of Medical Sciences, New Delhi
- Dr. S. Murugan, Associate Professor of Dermatology, Sri Ramachandra Medical College & Research Institute, Chennai

13. Physical Medicine and Rehabilitation

- Dr. Sanjay Wadhwa, Professor, Department of Physical Medicine & Rehabilitation, All India Institute of Medical Sciences, New Delhi
- Dr. George Tharion, Head, Department of Physical Medicine & Rehabilitation, Christian Medical College, Vellore, Tamil Nadu

- Dr. Jagdish Menon, Professor & Head, Department of Orthopaedics and Dept. of Physical & Rehabilitative Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry

14. General Surgery

- Dr. N Ananthakrishnan, 2A Vairam Enclave, Siddhananda Nagar, Pondicherry -605005.
- Dr. P. V. Chalam, Former Professor, Department of Surgery, Gandhi Medical College, Secunderabad, Telengana.
- Dr. Dinesh Bhatnagar, Professor, Department of General Surgery, North Delhi Municipal Corporation Medical College, Hindu Rao Hospital, Malka Ganj, Delhi

15. Ophthalmology

- Dr. Smita Singh, Professor, Department of Ophthalmology, Mahatma Gandhi Institute of Medical Sciences, Wardha

16. Oto-rhino-laryngology

- Dr. Achal Gulati, Director Professor, Department of ENT, Maulana Azad Medical College, New Delhi
- Dr. Ravi Kumar, Professor & Head, Department of ENT, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suma Mathew, Professor, Department of ENT, Christian Medical College, Vellore, Tamil Nadu

17. Obstetrics and Gynaecology

- Dr. Neerja Bhatla, Professor, Department of Obstetrics & Gynecology, All India Institute of Medical Sciences, New Delhi
- Dr. Annie Regi, Professor & Head, Department of Obstetrics & Gynecology, Christian Medical College, Vellore, Tamil Nadu
- Dr. Usha Vishwanath, Professor, Department of Obstetrics & Gynecology, Sri Ramachandra Medical College & Research Institute, Chennai

18. Orthopaedics

- Dr. P.V. Vijayaraghavan, Vice Chancellor & Professor of Orthopedics, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Raj Bahadur, Professor & Head, Department of Orthopaedics, Postgraduate Institute of Medical Sciences, Chandigarh
- Dr. SC. Goel, Professor, Department of Orthopaedics, Institute of Medical Sciences, BHU, Varanasi, Uttar Pradesh

19. Anaesthesiology

- Dr. Baljit Singh, Director Professor of Anaesthesia, G. B. Pant Hospital, Delhi
- Dr. Ramesh Keshav, Department of Anaesthesia, Dr. Ram Manohar Lohia Hospital, New Delhi
- Dr. Mridula Pawar, Consultant & Head, Department of Anaesthesia, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi

20. Radio- Diagnosis

- Dr. Kishor Taori (late), Professor & Head, Department of Radiodiagnosis, Government Medical College, Nagpur

21. Radiotherapy

- Dr. P. K. Jhulka, Dean & Professor of Radiotherapy, All India Institute of Medical Sciences, New Delhi.
- Dr. Shyam Shrivastava, Head, Department of Radiation, Tata Memorial Hospital, Mumbai



DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
CHENNAI-600 127.

22. Dentistry

- Dr. Sridevi Padmanabhan, Professor, Department of Orthodontics, Faculty of Dental Sciences, Sri Ramchandra Medical College & Research Institute, Chennai

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

M.D. / M.S.

1. POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM

2021 - 2022

M.D. PATHOLOGY


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
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CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

M.D. PATHOLOGY

1. GOAL

The purpose of this program is to standardize Pathology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating suitable manpower with appropriate expertise.

2. OBJECTIVES

(A) KNOWLEDGE

A candidate upon successfully qualifying in the M.D. (Pathology) examination should be -

1. Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc., for the purpose of diagnosis and overall wellbeing of the ill.
2. Able to teach and share his knowledge and competence with others. He / She should be imparted Training in teaching methods in the subject which may enable them to take up teaching assignments in Medical Colleges /Institutes.
3. Capable of pursuing clinical and laboratory based research. He /She should be introduced to basic research methodology so that they can conduct fundamental and applied research.

(B) ATTITUDE

Cognitive Domain-

1. Diagnose routine and complex clinical problems on the basis of Histopathology (Surgical Pathology) and Cytopathology specimens, Blood and Bone Marrow examination and various tests of Laboratory Medicine (Clinical Pathology, Clinical Biochemistry) and basics of Blood Banking (Transfusion Medicine).
2. Interpret and correlate clinical and laboratory data so that clinical manifestations of disease can be explained.
3. Advice on the appropriate specimens and tests necessary to arrive at a diagnosis in a problematic case.
4. Correlate clinical and laboratory findings with pathologic findings of autopsy specimens submitted for study.
5. Should be able to teach Pathology to undergraduates, nursing and paramedical students at the appropriate level.

6. Plan, execute, analyse and present research work.
7. Make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time as per standard guidelines. Identify problems in the laboratory, offer solutions thereof & maintain a high order of quality control.
8. Capable to organize safe & effective disposal of laboratory waste.
9. Able to supervise and work with subordinates and colleagues in a laboratory.

(C) SKILLS

Psychomotor Domain -

- 1) Able to perform most of the routine tests in a Pathology Laboratory including grossing of specimens, processing, cutting of paraffin and frozen sections, making smears, and staining.
- 2) Able to collect specimens by routinely performed non-invasive out-patient procedures such as venepuncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
- 3) Be able to interpret gross and microscopic findings of specimens submitted to the pathology department, by the Forensic Medicine department.
- 4) Should be familiar with the function, handling and routine care of equipments in the laboratory.

3. COMPONENTS OF THE POSTGRADUATE CURRICULUM:

A) Theoretical Knowledge

Post Graduate Training

Based on the available facilities, Department can prepare a list of postgraduate activities pertaining to basic and applied Pathology. Active learning should form the mainstay of postgraduate training. There should be lectures by postgraduates (at least 20 per year) along with seminars, symposia, group-discussions, Journal clubs. The postgraduate students should regularly interact with various clinical departments and learn cases of interest for discussion with the surgical, medical, super-speciality faculties. The postgraduate should actively involve in generating teaching resource material for U.G. and evolving of problem solving modules.

B) Practical and Clinical Skills

The following is a rough guideline to various teaching / learning activities that may be employed : -

- Collection of specimens including Fine needle aspiration of superficial lumps
- Grossing of specimens.
- Discussions during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.

- Clinico-pathological conferences.
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programmes.
- Journal Club.
- Research Presentation and review of research work.
- Guest and in-house lectures.
- Participation in workshops, conferences and presentation of papers, etc.
- Laboratory-work (Knowledge on technical aspect, Interpretation, Quality Control, Biomedical waste management and requirements of reagents and consumables).
- Use and maintenance of equipment – SOPs.
- Maintenance of records.
- Teaching undergraduates and paramedical staff.

C) Writing Thesis/Research Articles:

Thesis shall be submitted by each candidate at least 6 months before the date of commencement of the Theory examination.

D) Attitudes including Communication Skills

- 1) Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- 2) Develop communication skills to word reports and professional opinions with clarity as well as to interact with patients, relatives, peers and paramedical staff, & for effective teaching.

E) Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects

- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel & respect the rights of the patient including the right to information and second opinion.
- Should compulsorily attend the Research methodology workshop conducted by the University within first six months of M.D course.
- Are encouraged to attend Bio-ethics workshops/CMEs conducted by the University and other reputed Institutions.

4. THEORY SYLLABUS

Course Content :-

The study of Pathologic Anatomy includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology. Only the broad outlines are provided.

1) A)General Pathology:

Normal cell and tissue structure and function. The changes in cellular structure and function in disease. Causes of disease and its pathogenesis. Reaction of cells, tissues, organ systems and the body as a whole to various sublethal and lethal injuries.

B) Systemic Pathology:

The study of normal structure and function of various organ systems and the aetiopathogenesis, gross and microscopic alterations of structure of these organ systems in disease & functional correlation with clinical features.

2) Haematology:

The study of Haematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

3) Laboratory Medicine (Clinical Biochemistry /Clinical Pathology including Parasitology).

4) Basics of Transfusion Medicine (Blood-Banking).

5) The student is expected to acquire a general acquaintance of techniques and principles and to interpret data :

- a) Immunopathology.
- b) Electron microscopy.
- c) Enzyme Histochemistry.
- d) Immunohistochemistry.
- e) Cytogenetics.
- f) Molecular Biology.
- g) Maintenance of records.
- h) Information retrieval, Computer, Internet in Medicine and Microphotography.

A postgraduate is supposed to acquire not only professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyse the scientific data as well as to keep himself/herself abreast of the latest developments in the field of the pathology and related sciences. A brief outline of what is expected to be learnt during the M.D. Course is given under each head.

Surgical Pathology:-**Knowledge-**

- The student should be able to demonstrate an understanding of the histogenetic and patho-physiologic processes associated with various lesions.
- Should be able to identify problems in the laboratory and offer viable solutions.

Autopsy Pathology :-**Knowledge –**

- Should have sufficient understanding of various disease processes so that a meaningful clinico-pathological correlation can be made.
- Correctly identify all morphological (gross and Microscopic) changes of the specimens submitted.
- Write correctly and systematically Provisional and Final Anatomic Diagnosis reports.

Cytopathology:-**Knowledge -**

- Should possess the background necessary for the evaluation and reporting of Cytopathology specimens.
- Should possess knowledge of the following, keeping in mind the indication for the test:
 1. Choice of site from which smears may be taken(as in the case of vaginal smears).
 2. Type of samples.
 3. Method of obtaining various specimens (urine sample, gastric smear, colonic lavage, sputum, Squash cytology, FOB wash and brush etc.)
 4. Be conversant with the principles and preparation of stains.

Haematology :-**Knowledge-**

- Should demonstrate the capability of utilizing the principles of the practice of Haematology for the planning of tests, interpretation and diagnosis of diseases of the blood and bone marrow.

Should be conversant with various equipments used in the Haematology laboratory.

Should have knowledge of automation and quality assurance in Haematology.

Correctly plan a strategy of investigating at least 90% of the cases referred for special investigations in the Haematology Clinic and give ample justification for each step in consideration of the relevant clinical data provided.

Laboratory Medicine :-**Knowledge –**

Possess knowledge of the normal range of values of the chemical content of body fluids, significance of the altered values and its interpretation.

Possess knowledge of the principles of the relative utility and limitations and significance of the altered values:

- i. In Relevant Biochemical tests
 - Know the principles, advantages and disadvantages scope and limitation of Automation in laboratory.
 - Know the principles and methodology of quality control in laboratory.

Transfusion Medicine (Blood Banking) :-**Knowledge -**

Students should possess knowledge of the following aspects of Transfusion Medicine:

- Basic immunology.
- ABO and Rh groups.
- Clinical significance of other blood groups.

- Transfusion therapy including the use of whole blood and RBC concentrates.
- Blood component therapy.
- Rationale of pre-transfusion testing.
- Infections transmitted in blood

a) Immunopathology:

Knowledge –

- i. Demonstrate familiarity with the current concepts of structure and function of the immune system, its aberrations and mechanisms thereof.
 - ii. Demonstrate familiarity with the scope, principles, limitations and interpretations of the results of the following procedures employed in clinical and experimental studies relating to immunology :
 - (a) ELISA techniques.
 - (b) Radioimmuno assay.
 - (c) HLA typing.
- (bi) Interpret simple immunological tests used in diagnosis of diseases and in research procedures.
- a) Immunofluorescence techniques especially on kidney and skin biopsies.

b) Electron Microscopy :

Knowledge –

- (i) Demonstrate familiarity with Principles and Techniques of electron microscopy and the working of an electron microscope (including Transmission and Scanning Electron Microscope: TEM and SEM).
- (ii) Recognise the appearance of the normal subcellular organelles and their common abnormalities (when provided with appropriate photographs).

C) Enzyme Histochemistry :

Knowledge –

Should be familiar with the principles, use and interpretation of common enzyme histochemical procedures (Alkaline Phosphatase, Acid Phosphatase, Glucose-6-Phosphate Dehydrogenase, Chloroacetate Esterase).

d) Immunohistochemistry : Knowledge –

Demonstrate familiarity with the principles and exact procedures of various immunohistochemical stains using both PAP (Peroxidase-Antiperoxidase) and AP-AAP (Alk. Phosphatase-anti Alk. Phosphatase) ABC (Avidin-Biotin Conjugate) Systems;

Employing monoclonal and polyclonal antibodies. Be aware of the limitations of immunohistochemistry.

e) Molecular Biology:**Knowledge –**

Should understand the principles of Molecular Biology especially related to the understanding of disease processes and its use in various diagnostic tests.

Should be conversant with the principle & steps and interpretations of a Polymerase Chain Reaction (PCR Western Blot, Southern Blot, Northern Blot and Hybridisation procedures).

f) Cytogenetics :**Knowledge –**

Demonstrate familiarity with methods of Karyotyping and Fluorescent in-situ

Hybridisation(FISH).

g) Tissue Culture:**Knowledge –**

Demonstrate familiarity with methods of tissue culture.

5. TEACHING LEARNING METHODS (including Clinical Study)**Surgical Pathology:-****Skills-**

- Given the clinical and operative data, the student should be able to identify, and
- systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly identify the lesions received from the surgical service of an average teaching hospital.
- A student should be able to demonstrate ability to perform a systematic gross
- examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies, nerve biopsies and skin biopsies to demonstrate the orientation of tissues in paraffin blocks.
- The student should be able to identify and systematically and accurately describe the chief histomorphological alterations in the tissue received in the surgical pathology service. He /She should also correctly interpret & correlate with the clinical data to help in the diagnosis of the routine surgical material received.

Be conversant with all the equipment in the Histopathology and the Clinico pathology lab and the principles of its running.

Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.

Stain paraffin sections with at least the following:

- (i) Haematoxylin and eosin.
- (ii) Stains for collagen, elastic fibers and reticulin, congo red
- (iii) Iron stain.
- (v) PASstain.
- (vi) Acid fast stains.
- (vii) GMS stains
- (viii) Any other stains needed for diagnosis – fungal stains.

Demonstrate understanding of the principles of:

- (i) Fixation of tissues.
- (ii) Processing of tissues for section cutting.
- (iii) Section cutting and maintenance of related equipment.
- (iv) Differential (Special) stains and their utility.

Cut a frozen section using freezing microtome /cryostat, stain and interpret the slide in correlation with the clinical data provided, and correctly diagnose at least 75 percent of the lesions within 15 minutes. Perform fat stain on frozen section.

- Perform and interpret the utility of various immunohistochemical stains especially in the diagnosis of tumour subtypes.

Cytopathology:-

Skills-

- Independently prepare and stain good quality smears for cytopathologic examination.
- Be conversant with the techniques for concentration of specimens: i.e., various filters, centrifuge and cytocentrifuge.
- Independently be able to perform fine needle aspiration of palpable superficial lumps in patients; make good quality smears and be able to decide on the type of staining in a given case. Desirable to have a knowledge in image guided FNACs. Knowledge of preparation of Cell blocks, LBCs.

Given the relevant clinical data, he / she should be able to independently and correctly :

- i. Evaluate hormonal status in all cases as may be required.
- ii. Diagnose the status of malignancy or otherwise in at least 75% of the cases received in a routine laboratory and categorise them into negative, inconclusive and positive.
- iii. Demonstrate ability in the technique of screening and dotting the slides for suspicious cells.
- iv. Indicate correctly the type of tumour, if present, in at least 75% cases.
- v. Identify with reasonable accuracy the presence of organisms, fungi and parasites in at least 75% of cases.

Haematology :-

Skills-

- Observe and/or perform/interpret correctly and independently the following special tests, in addition to doing the routine blood counts:
 - i. Haemogram including Reticulocyte and Platelet counts, ESR, PCV, Osmotic fragility test
 - ii. Bone marrow staining including stain for iron.
 - iii. Blood smear staining (thick and thin smear)
 - iv. Cytochemical characterization of leukemia with special stains like Peroxidase, Leukocyte Alkaline Phosphatase (LAP), PAS, Sudan Black, etc.
 - v. Hemolytic anaemia profile including HbF, Hb electrophoresis, etc.
 - vi. Coagulation profile including PT, APTT, FDP, Factors assay.
 - vii. BM aspiration and BM biopsy.
- Demonstrate familiarity with the principle and interpretation of results and utility in diagnosis of the following :
 - i. Cytogenetics – Karyotypes of Leukemia – CML, promyelocytic leukemia, common trisomy and monosomies like Downs, Turner's and Klinefelter syndromes.
- Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in non-neoplastic and neoplastic diseases and arriving at a correct diagnosis in at least 90% of the cases referred to the Haematology clinic, given the relevant clinical data.

Laboratory Medicine :-

Skills –

- Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; Be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.
- Demonstrate familiarity with and successfully perform.
 - i. Routine Urinalysis including Physical, Chemical and Microscopic, examination
 - ii. A complete examination; physical, chemical and cell content of Cerebrospinal fluid (C.S.F.), Pleural, synovial, pericardial and Peritoneal fluid.
 - iii. Semen analysis.
 - iv. Absolute Eosinophil Count
 - v. Examination of Peripheral Blood for the commonly occurring parasites along with QBC.
 - vi. Be familiar with the preparation of standard solution and chemicals relevant to Histopathology and clinical pathology
- Explain the principle of Instrumentation, use and application of the instruments commonly used in the laboratories, eg., Photoelectric colorimeter, Electrophoresis, Centrifuge, Flow cytometer.

d) Immunohistochemistry :

Skills –

Be able to interpret panel of IHC markers appropriate for the condition and perform immunohistochemical staining using paraffin section with at least one of the commonly used antibodies (Cytokeratin or LCA) using PAP method.

6. STRUCTURED TRAINING PROGRAMME

The three-year training programme for the M.D. degree may be arranged in the form of postings to different assignments / laboratories for specified periods as outlined below. The period of such assignments / postings is recommended for 35 months. Postings schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge & skill, extramural postings may be undertaken.

	<u>Section / Subject</u>	<u>Duration in Month</u>
(i)	Surgical Pathology	14
(ii)	Surgical Pathology Techniques	1
(iii)	Haematology	8
(iv)	Cytopathology	6
(v)	Laboratory Medicine including Clinical Biochemistry and clinical Immunology	2
(vi)	Transfusion Medicine /Blood Bank	1
(vii)	Ancillary Techniques including Immunopathology – Transplant immunology, HLA typing, Molecular Biology basics, Research Methodologies and Electrophoresis .	1
	Elective / Reorientation including research methodologies	2
	Total	35 months

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

The training programme should be designed to enable the student to acquire a capacity to learn and investigate for himself / herself, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programmes and scheduling of postings must provide the student with opportunities to achieve the above broad objectives. Most of the learning is to be accomplished by the student himself. Interactive discussions are to be preferred over didactic sessions. The student must blend as an integral part of the activities of an academic Department that usually revolves around three equally important basic functions of teaching, research and service. As mentioned earlier the emphasis is recommended under a residency programme or learning while serving / working.

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

8. **COMPETENCY ASSESSMENT:**

1. **OVERALL:**

- a) Communication / commitment / Contribution /
Compassion towards patient and Innovation - 5 marks
- b) Implementation of newly learnt techniques/Skills

2. Number of cases presented in Clinical Meetings/
Journal Clubs/Seminars - 5 marks

3. Number of papers presented in conferences/Publications /
Research Projects. - 5 marks

4. No. of Medals / Certificates won in the conference /
Quiz competitions and other academic meetings with details. - 5 marks

20 Marks

PG NON – CLINICAL COURSE

- VIVA including Competency Assessment - 60 Marks (40 + 20)
Pedagogy - 40 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr.	PARTICULARS	Not Satisfactory			Satisfactory More Than			Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1	Journal based / recent advances learning										
2	Patient based /Laboratory or Skill based learning										
3	Self directed learning and teaching										
4	Departmental and interdepartmental learning activity										
5	External and Outreach Activities / CMEs										
6	Thesis / Research work										
7	Log Book Maintenance										

Any significant positive or negative attributes of a postgraduate student to be mentioned.
 For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

10. THEORY EXAMINATION

Theory : There shall be four theory papers

PATTERN OF EXAMINATION :-

FOUR PAPERS - 100 Marks each 3 Hours duration each

Paper I: General Pathology, Pathophysiology, Immunopathology and Cytopathology

Paper II: Systemic Pathology

Paper III: Haematology, Transfusion Medicine (Blood Banking) and Laboratory Medicine

Paper IV: Recent advances and applied aspects

Question Paper Pattern:

Structured Essay Questions - 2 x 15 Marks = 30 Marks

Short Notes - 10 x 5 Marks = 50 Marks

Reasoning out - 4 x 5 Marks = 20 Marks

100 Marks

11. PRACTICAL EXAMINATION

PRACTICALS DAY 1 FORENOON SESSION

HAEMATOLOGY / CLINICAL PATHOLOGY / BLOOD BANKING (2 HRS) (10 + 10 + 5 = 25 Marks)	25 MARKS
GROSSING /AUTOPSY /GROSS SPECIMEN FOR Dx& DISCUSSION (1.5 H) 5+ 10+10 MARKS	25 MARKS
AFTERNOON SESSION	
HAEMATOLOGY + CYTOLOGY SLIDES & DISCUSSION (5 Slides x 5 Marks) + (5 Slides x 5 Marks) (2 HRS) (10 SLIDES X 5 MARKS)	50 MARKS
DAY2	
FORENOON SESSION	
	80 MARKS

HISTOPATHOLOGY SLIDES & DISCUSSION 2.5 HOURS) (16 SLIDES X 5 MARKS)	
OSPE (5X4 marks)	20 MARKS
AFTERNOON SESSION – 2 Hours	
PEDOGOGY	40 MARKS
VIVA	60 MARKS
LOG BOOK	
AGGREGATE (CLINICAL + VIVA) TOTAL	300 MARKS
MINIMUM REQUIRED FOR PASS (50%)	150 MARKS
DISSERTATION	APPROVED /NOT APPROVED

The practical examination shall consist of the following and should be spread over two days.

Clinical Case discussion (10 marks):	: Discussion of a clinical case history. □ Plan relevant investigations of the above case and interpret the biochemistry findings. □ Two investigations should be performed including at least one biochemistry exercise/clinical pathology exercise like CSF, pleural tap etc. analysis and complete urinalysis.
Haematology & Blood Banking (10+5 =15marks)	: Discuss haematology cases given the relevant history. Plan relevant investigations □ Perform complete hemogram and at least two tests preferably including one coagulation exercise □ Identify electrophoresis strips, osmotic fragility charts etc. Interpretation of data from autoanalysers, HPLC and flow cytometry.
A. Histopathology (80 Marks) & Cytopathology (25 marks)	: Examine report and discuss sixteen histopathology and Five Cytopathology cases given in the relevant history and slides. To be familiar with MGG, PAP and other special stains, H&E on cytology smear, IHC on cell block. Perform a Haematoxylin and Eosin stain and any special stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.

B. Hematology slides (25 marks):	:	Examine, report and discuss around ten cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.
Structured Autopsy (10 Marks)	:	Given a case history and relevant organs. Give a list of anatomical diagnosis in an autopsy case.
Gross Pathology (10+5=15 marks)	:	Perform grossing of one gross specimen. Describe findings of another gross specimen, give diagnosis and identify the sections to be processed.
Basic Sciences (OSPE – 5x4 = 20 marks)	:	Identify Electronmicrographs, osmotic fragility tests, Electrophoretic strips, Flow cytometry pictures, Sequencing, Karyotyping and FISH pictures Identify gels, results of PCR, immunological tests including staining for direct / indirect immuno fluorescence. Identify histochemical and immunohistochemistry stains.

All practical exercises are to be evaluated jointly by all the examiners. An oral question-answer section should be conducted at the end of each exercise.

12. LOG BOOK

- Every Post-graduate candidate shall maintain a record of skills he/she has acquired during the training period certified by the various Heads of Departments where he / she has undergone training including outside the institution.
- The candidate should also be required to participate in the teaching and training programme of post-graduate and intern-students.
- In addition, the Head of the Department shall involve their postgraduate candidates in Seminars, Journal Clubs, Group Discussions and participation in clinical, clinico-pathological conferences.
- Every Post-graduate candidate should be encouraged to present short title papers in conferences and improve on it and submit them for publication in reputed medical journals. Motivation by the Heads of Departments is essential in this area to sharpen the research skills of the post-graduate candidates.
- Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.
- At the end of the course, the candidate should summarise the contents and get the Log Book certified by the Head of the Department.
- The Log Book should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.

13. VIVA (including Competency Assessment) – (60 Marks (40 + 20))

An unstructured viva will be carried out by the examiners. VIVA including Competency Assessment for PG Non – Clinical courses

14. PEDAGOGY:**(8 minutes Presentation and 2 Minutes Q & Ans)**

• Demeanour	- 10
• Audio visual Aids usage, voice modulation and Attitude	- 10
• Subject Content	- 10
• Q & Ans /Interaction	- 10

Total**40 Marks****15. OSCE / OSPE:**OSPE containing five charts each carrying 4 marks (**5x4 = 20 marks**)**Charts may have these topics**

- Electronmicrographs
- Osmotic fragility tests
- Electrophoretic strips
- Flow cytometry pictures
- Gene Sequencing
- Karyotyping
- FISH pictures
- Identify gels, results of PCR
- Immunological tests including staining for direct / indirect immuno fluorescence.
- Identify and interpret histochemical and immunohistochemistry stains

Electron Microscopy

11 years male presented with proximal muscle weakness, hypotonia and delayed motor developments.

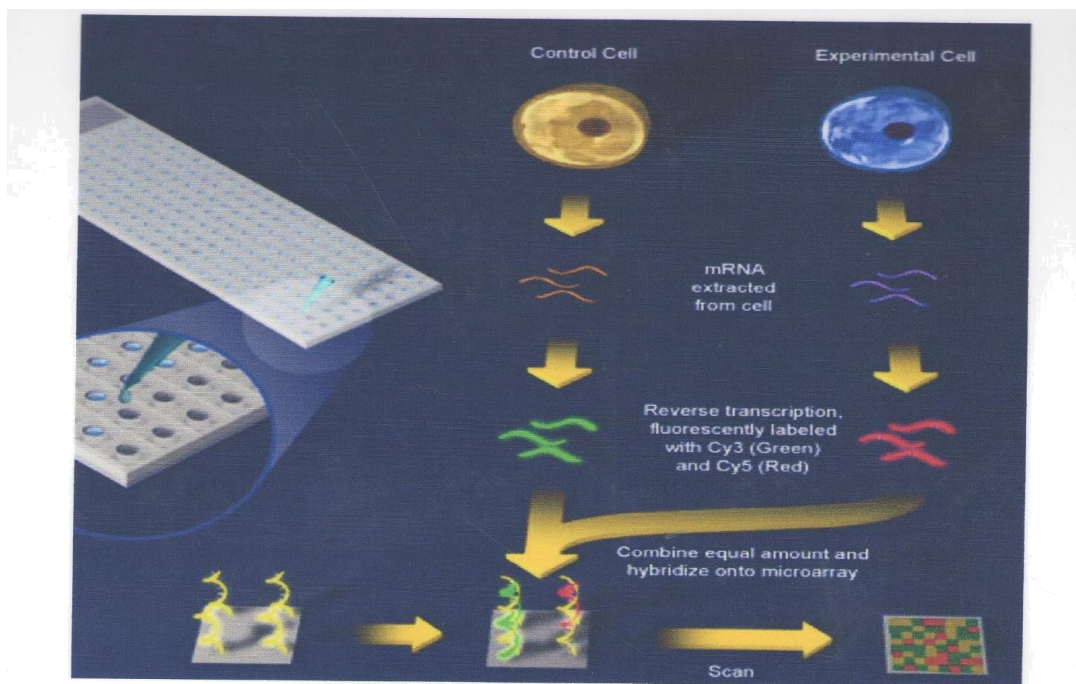
Muscle biopsy was done and sent for HPE and Electron Microscopy

Questions :

1. Write your diagnosis
2. Write the Electron Microscopy findings



1. WHAT IS THE DIAGNOSTIC TOOL ILLUSTRATED HERE ?
2. WHAT ARE THE OTHER NAMES FOR THIS DIAGNOSTIC TOOL ?
3. WHAT ARE THE STEPS INVOLVED IN THIS PROCEDURE ?
4. WHAT ARE ITS APPLICATIONS ?
5. WHAT IS PROTEOMICS ?



IMMUNOHISTOCHEMISTRY – V

5) 46 years old male patient presented with a huge mass lesion in the left thigh. Biopsy was taken. HPE diagnosis was epithelioid sarcoma.

IHC markers were used for diagnosis.

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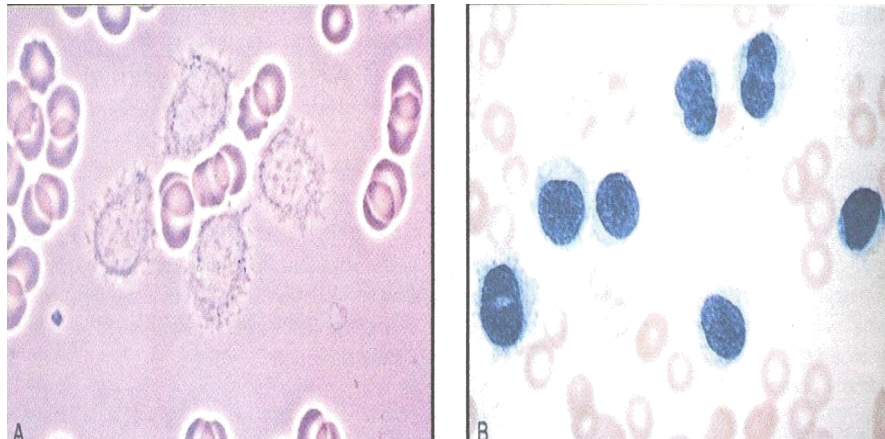
S 100

QUESTIONS :-

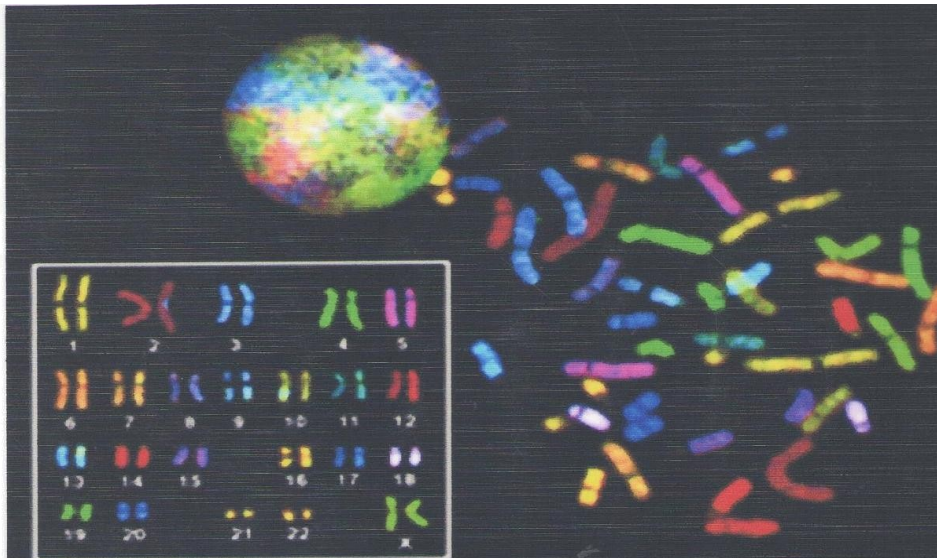
1. What is your diagnosis ?
2. What are your differential diagnosis ?
3. How did you rule them out with this panel of antibodies ?
4. What are the other investigations which can be done to confirm your diagnosis ?

HAEMATOLOGY

7) 35 years old male presented with massive splenomegaly and pancytopenia. Identify the following pictures and given your diagnosis.

**QUESTIONS :-**

1. What is your diagnosis ?
2. What are the other tests to confirm your diagnosis ?
3. What are the immunohistochemical markers expressed by these cells ?
4. What is the enzyme histochemical marker available for confirmation ?



- 1) WHAT IS THE MOLECULAR DIAGNOSTIC PROCEDURE SHOWN HERE ?
- 2) WHAT ARE THE STEPS INVOLVED IN THIS PROCEDURE ?
- 3) WHAT ARE THE APPLICATIONS OF THIS MOLECULAR DIAGNOSTIC TOOL ?
- 4) WHAT IS THE ADVANTAGE OF THIS DIAGNOSTIC TOOL ?
- 5) WHAT ARE MARKER CHROMOSOMES ?

REFERENCE BOOKS

I. ESSENTIAL READING :-

- 1) Robbins Pathologic basic of disease – 7th edn Elsevier
- 2) Diagnostic Surgical Pathology – Sternberg.
- 3) Ackerman's Surgical Pathology – Juan Rosai – 9th edn Mosby
- 4) Diagnostic Histopathology of Tumours – Fletcher – 2nd edn Churchill Livingstone.
- 5) Soft Tissue Tumours – Enzinger & Weiss
- 6) Manual and Atlas of fine needle aspiration cytology – Orell 2nd edn 2005 elsevier.
- 7) Diagnostic exfoliative Cytology – Koss 5th edn 2006 Lippincott.
- 8) AFIP fascicles on various tumours.
- 9) WHO fascicles.
- 10) Wintrobe's Haematology, 2004
- 11) Practical Haematology, Dacie ELBS edn.
- 12) Theory & Practice of Histological techniques - & staining – Bancroft & Stevens.
- 13) Recent Advances in Pathology Churchill Livingstone
- 14) Handbook of autopsy practice Ludwig Humana press

II. EXTENDED READING :-

- 1) Pathology of Liver – Macsween
- 2) Breast pathology by Rosen Lippincott 2001
- 3) Gastrointestinal pathology – Morson & Dawson Blackwell 2003.
- 4) Practical pulmonary pathology Leslie & Wick Churchill Livingston 2005
- 5) Iochim's Lymph node pathology Iochim & Ratech Lippincott William Wilkins
- 6) Blaustein's Pathology of female genital tract Springer 2002
- 7) Atlas of orthopedic pathology – Wold, Adleer, Sim, Unni 2003
- 8) Histopathology of Skin – Lever.
- 9) Pathology of Skin – Mckee, Calonje Elsevier Mosby 2005
- 10) Bone Marrow pathology – Bain Claud Lampert Wilkins 2001
- 11) Ophthalmic pathology – Spencer WB Saunders latest edn.
- 12) Biopsy interpretation series
- 13) Paediatric Pathology – Stocker & Dehner William & Wilkins 2001
- 14) Surgical pathology of nervous system and its coverings – Burger, Scheithaur, Vogel Churchill Livingston 2002.

**** Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

17. JOURNALS

1. ACTA CYTOLOGICA
2. ADVANCES IN ANATOMIC PATHOLOGY
3. AMERICAN JOURNAL OF CLINICAL PATHOLOGY
4. AMERICAN JOURNAL OF PATHOLOGY
5. AMERICAN JOURNAL OF SURGICAL PATHOLOGY
6. ARCHIVES OF PATHOLOGY & LABORATORY MEDICINE
7. BRAIN TUMOR PATHOLOGY
8. DIAGNOSTIC CYTOPATHOLOGY
9. INDIAN JOURNAL OF PATHOLOGY AND MICROBIOLOGY
10. INTERNATIONAL JOURNAL OF GYNECOLOGICAL PATHOLOGY
11. INTERNATIONAL JOURNAL OF SURGICAL PATHOLOGY
12. JOURNAL OF CLINICAL PATHOLOGY
13. MODERN PATHOLOGY
14. JOURNAL OF ORAL PATHOLOGY & MEDICINE
15. ENDOCRINE PATHOLOGY


 DEAN
 TAGORE MEDICAL COLLEGE & HOSPITAL
 RATHINAMANGALAM, MELAKOTTAIYUR POST,
 CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY
No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

M.D. / M.S.
POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM

2021 - 2022

MD COMMUNITY MEDICINE


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

MD COMMUNITY MEDICINE

1. PREAMBLE

The purpose of this program is to standardize Community Medicine teaching at Post Graduate level throughout the country.

Program Objectives

A candidate upon successfully qualifying in the M.D. (Community Medicine) examinations should be competent in the following areas:-

- I. Health policy, planning, leadership and management (organizational skills , managerial, Administrative)
- II. Epidemiology, Biostatistics and Research Methodology (technical)
- III. Health Promotion and disease prevention(technical)
- IV. Behavior Change Communication (soft skills of communication, motivation, decision-making, team building.)
- V. Education technology (skills in Health Information Management, software Application, training in scientific communication and medical writing.
- VI. Public Health Ethics:

The Community Medicine specialist, will inculcate a holistic view of health and medical interventions primarily focused on Community Health/ Population Health. Thus, he/she should be equipped with the knowledge, skills, competencies in primary, secondary & tertiary care, control and prevention of outbreaks/epidemics, community diagnosis, health needs assessment, epidemiological assessment, research and planning evidence-based health policies and programmes.

2. SPECIFIC LEARNING OBJECTIVES

In the area of (I) **Public Health policy, planning, leadership and Management**, he/she should be able to:-

- 1) Identify health problems of the community in the context of the socio-economic cultural milieu

- 2) Identify threats to the environment
- 3) Identify groups which require special attention (elderly, adolescents, gender, the poor and other marginalized groups) including those facing occupational hazards
- 4) Prioritize health problems
- 5) Set objectives; prepare action plan; implement programs; and monitor, supervise and evaluate them
- 6) Plan health manpower development, logistics and materials management
- 7) Assess costs, plan, implement and supervise budget and alternative health options
- 8) Manage Health Information System and respond appropriately to the information gathered
- 9) Understand basics of hospital management
- 10) Study quality assurance and medical audit
- 11) Understand and Implement public health laws
- 12) Initiate, implement and supervise National Health Programs
- 13) Recommend policies relevant for the local community and region and propose ways to upscale it to a larger area (state/country)
- 14) Establish Surveillance System and respond to public health threats effectively and efficiently
- 15) Anticipate, prepare for and respond to disasters

In the area of (II) **Epidemiology, Biostatistics and research methodology**, he/she should be able to:-

- 1) Use effectively the tools of epidemiology for understanding disease distribution and determinants of diseases.
- 2) Identify sources of data and identify key aspects of measurement problems
- 3) Critically analyze available scientific information data, identify gaps in knowledge and formulate research questions
- 4) Design and conduct epidemiological studies
- 5) Design and conduct qualitative research methods
- 6) Effectively manage data, analyze, interpret and present findings
- 7) Recommend effective strategies to improve health status of the community based on the findings
- 8) Document epidemiological findings and disseminate and recommend policies

- 9) Use epidemiologic methods to investigate disease outbreaks
- 10) Use epidemiologic methods to evaluate health care delivery and conduct health systems research
- 11) Perform economic evaluation of illness and health interventions

In the area of (III) **Health Promotion and disease prevention**, he/she should be able to:-

- 1) Understand the epidemiology of communicable and non-communicable diseases and preventive measures and manage national health programs
- 2) Identify the health issues of special groups of people and plan and implement strategies to improve their health status
- 3) Identify the environmental issues affecting health of the community and plan interventions
- 4) Identify issues related to nutrition, life style and occupation and plan interventions

In the area of (IV) **Behavior Change Communication**, he/she should be able to:-

- 1) Understand the structure and behavior of communities and identify societal or individual behavior problems that can be improved
- 2) Interact, communicate, educate effectively to people from diverse backgrounds, ages and gender to promote healthy behavior through community involvement
- 3) Analyze different types of health communication initiatives and BCC tools
- 4) Plan and develop environments that enable the maintenance of positive health behaviors, and evaluate
- 5) Facilitate inter-sectoral coordination for promoting health of communities
- 6) Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector

In the area of (V) **Teaching and Training**, he/she should be able to:-

- (1) Assess the learning needs of any given group
- (2) Formulate learning objectives
- (3) Plan curriculum and prepare curriculum materials
- (4) Select and implement appropriate learning methods
- (5) Evaluate learning experiences

In the area of (VI) **Ethics in Public Health**, he/she should be able to:-

- 1) Understand the Basic principles and theories of Bioethics
- 2) Be familiar with the codes and regulations pertinent to clinical and research ethics
- 3) Identify and analyze ethical issues in public health practice, biological and medical research, and health policy
- 4) Identify the beliefs and interests of stakeholders and their impact on ethical decision making in professional and research practice
- 5) Identify, anticipate and respond to public concerns in relation to public health intervention

3. COMPONENTS OF THE POSTGRADUATE CURRICULUM

- Practical and clinical skills training is provided by posting in the different clinical departments and primary care centres (rural and urban) in addition to offices of District level and state level health authorities.
- Training in Research Methodology writing/Research activities. University accredited workshops would be organised for standard training in research methodology. Hands on experience in research is ensured through preparation of dissertation thesis. Other surveys and research activities would be guided by faculty for favour of presentation at conferences and publications.
- Attitude including communication skills are inculcated by microteaching sessions (Paedagogy) for guided practice and under graduate classes and group health education sessions for independent practice in addition to clinico-social case studies for individual comprehensive management.
- Medical ethics/bioethics- Students should be oriented to the various components of ethics, ethics in research and differential equity in community services.
- Medicolegal Aspects: A detailed orientation to the public health acts/laws related to health is given through regular theory sessions and guest lectures.

Training in Research Methodology, Medical Ethics/Bioethics and Medical Legal aspects

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.
-
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
-
- Medical ethics/Bioethics, moral and legal issues are part and parcel of the curriculum and syllabus

4. THEORY SYLLABUS

Paper I: History of Public Health, Concepts in Public Health, Epidemiology and Research Methodology and Nutrition

History of Public Health

1. History of different systems of Medicine
2. Public health events - Sanitary awakening, germ theory of disease, rise of Public health in various countries
3. Primary Health Care

Concepts in Public Health

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: demography, mortality and morbidity profile and the existing health facilities in health services.
6. Difficulties in measurement of health.
7. National Health Policy

Epidemiology

1. Use of epidemiological tools to make a community diagnosis of the health situation in order to formulate appropriate intervention measures.
2. Epidemiology - definition, concept and role in health and disease.
3. Definition of the terms used in describing disease transmission and control.
4. Natural history of a disease and its application in planning intervention.
5. Modes of transmission and measures for prevention and control of communicable and non-communicable disease.
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, statistical tests of significance and their application.
9. Need and uses of screening tests.
10. Accuracy and clinical value of diagnostic and screening tests (sensitivity, specificity, & predictive values).
11. Planning and investigation of an epidemic of communicable diseases in a community setting.
12. Institution of control measures and evaluation of the effectiveness of these measures.
13. Various types of epidemiological study designs.
14. Qualitative methods: Describe the range and purpose of different approaches to Qualitative inquiry and identify the range of qualitative data collection techniques.
15. The derivation of normal values and the criteria for intervention in case of abnormal values.
16. Planning an intervention programme with community participation based on the Community diagnosis.
17. Applications of computers in epidemiology.
18. Critical evaluation of published research.
19. Disaster Management
20. Bio ethics

Biostatistics

The scope and use of Biostatistics

- a. Collection, classification and presentation of statistical data.
- b. Analysis and interpretation of data.
- c. Obtaining information, computing indices (rates and ratio) and making comparisons.
- d. Apply statistical methods in designing of studies.
- e. Choosing of appropriate sampling methods and sample size.
- f. Applying suitable test of significance
- g. Use of statistical tables.

Nutrition

1. Nutritional problems of the country; Role of nutrition in Health and Disease.
2. Common sources of various nutrients and special nutritional requirement according to age, sex, activity, physiological conditions.
3. Nutritional assessment of individual, families and the community by selecting and using appropriate methods such as : anthropometry, clinical, dietary, laboratory techniques.
4. Compare recommended allowances of individual and families with actual intake.
5. Plan and recommend a suitable diet for the individuals and families bearing in mind local availability of foods, economic status etc.
6. Common nutritional disorders: protein energy malnutrition, Vitamin A deficiency, anemia, iodine deficiency disorders, fluorosis, food toxin diseases and their control and management.
7. National Nutritional Policy.
8. National programmes in nutrition and their evaluation.
9. Food adulteration: prevention and control.

Paper II: Epidemiology of Communicable and Non communicable diseases along with relevant National Programs and Environmental Health.

1. Epidemiology of communicable and non-communicable diseases of public health Importance and their control.

The specific objectives of selected communicable diseases of public health importance for which National Disease Control/Eradication Programmes have been formulated are described here.e.g Infective hepatitis, ARI, T.B. Malaria, Filariasis, STDs & AIDS, Diarrhoeal diseases, Kala Azar, Mental Health, Non communicable diseases, Blindness, Hypertension, Leprosy, Accidents, JE, VPDs, Plague, Chickenpox etc.

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 disease.
4. Control of communicable and non-communicable disease 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 disease.

2. Level of awareness of causation and prevention of diseases amongst individuals and communities
3. Institution of programmes for the education of individuals and communities.
4. Knowledge of the relevant National Health Programmes
5. Epidemiological basis of national health programmes.
6. Awareness of programmes for control of non-communicable diseases.
7. Emerging and Reemerging diseases
8. Hospital acquired infections / Drug resistance

Entomology

1. Role of vectors in the causation of diseases.
2. Steps in management of a case of insecticide toxicity.
3. Identifying features of and mode of transmission of vector borne diseases.
4. Methods of vector control with advantages and limitations of each.
5. Mode of action, dose and application cycle of commonly used insecticides

Environmental Sanitation

1. Awareness of relation of Environment to Health.
2. Awareness of the concept of safe and wholesome water.
3. Awareness of the requirements of sanitary sources of water.
4. Understanding the methods of purification of water on small scale with stress on chlorination of water
5. Various biological standards.
6. Physical, chemical standards; tests for assessing quality of water.
7. Concepts of safe disposal of human excreta.
8. Disposal of solid waste, liquid wastes both in the context of urban and rural conditions in the community.
9. Problems in the disposal of refuse, sullage and sewage.
10. Sources, health hazards and control of environmental pollution.
11. Influence of physical factors – like heat, humidity, cold, radiation and noise – on the health of the individual and community.
12. Standards of housing and the effect of poor housing on health
13. Global warming.
14. Biomedical Waste Management

Paper III: Demography and SPECIAL GROUPS (Maternal and Child health, School health, Adolescent and geriatric health, Genetics & Mental Health, Occupational health and Urban Health)

Demography and Family Planning

1. Definition of demography and its relation to Community Health.
2. Stages of the demographic cycle and their impact on population.
3. Definition, calculation and interpretation of demographic indices like birth rate, death rate, growth rate, fertility rates.
4. Reasons for rapid population growth in the world, especially 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. Principles of Counselling; Client satisfaction.
8. Medical Termination of Pregnancy Act.
9. Organisational, technical and operational aspects of the National Family Welfare Programme and participation in the implementation of the Programme. Target Free Approach.
10. Give guidelines for MTP and infertility services.
11. Recent advances in contraception.
12. National Population Policies.

Reproductive and Child Health

- (a) Antenatal – examination of the mother; application of the risk approach in antenatal care.
- (b) Intranatal – conducting a normal delivery; early recognition of danger signals in intranatal period; referral of cases requiring special care, essential obstetrics care, emergency obstetrics care.
- (c) Postnatal – assessment of the mother and new born, advice about appropriate family planning method; promotion of breast-feeding; advice on weaning.
- (d) Assessment of growth and development of the child – use of 'road to health' card; recording important anthropometric assessments of the child; giving immunisation to the child; identifying high-risk infant.
- (e) Management guidelines as per the 'Integrated Management of Neonatal and Childhood Illness'(IMNCI)
- (f) Objectives, Justification, Strategy, Implementation & Achievements with regard to the Reproductive Child Health Program.

At risk groups

1. Adolescent Health
2. High risk group children – juvenile delinquents, orphans,
3. Geriatric Problems, Management and Policy for the elderly.
4. Person living With Disabilities (PWD).

Genetics and Mental Health

1. Public health importance of mental health
2. Public health approach to mental health problems: types, diagnosis and management of mental health problems in the community
3. Genetics, diseases mediated through genetic abnormalities, Gene mapping, Genetic engineering and therapy.

School Health

1. Problems of school and adolescents; Objectives of the School Health Programme.
2. Activities of the Programmes like :
 - (a) Carrying out periodic medical examination of the children and the teachers.
 - (b) Immunisation of the children in the school.
 - (c) Health Education
 - (d) Mid-day meals.
3. Obtaining participation of the teachers in the school health programme including maintenance of records; defining healthful practices; early detection of abnormalities.
4. Organization, implementation, supervision and evaluation of School Health Programme

Occupational Health

1. Relate the history of symptoms with the specific occupation including agriculture.
2. Identification of the physical, chemical and biological hazards to which workers are exposed to while working in a specific occupational environment.
3. Diagnostic criteria of various occupational diseases.
4. Preventive measures against these diseases including accident prevention.
5. Various legislations in relation to occupational health.
6. Employees State Insurance Scheme.
7. Migrant Workers

Urban health

1. Impact of urbanisation on health and disease.
2. Common health problems (Medical, Social, Environmental, Economic, Psychological) of urban slum dwellers.
3. Organisation of health services for slum dwellers.
4. Organisation of health services in urban areas.

Paper IV: Recent Advancements, Health planning, Management and Public Health Administration, Sociology and Education Technology.

Explain the terms: public health, public health administration, regionalisation, comprehensive health care, primary health care, delivery of health care, planning, management, evaluation, National Health Policy, Development of Health Services in India and various committee reports.

Components of health care delivery

- (i) Describe the salient features of the National Health Policy concerning :
 - (a) provision of medical care;
 - (b) primary health care and Health for All;
 - (c) health manpower development;
 - (d) planned development of health care facilities;
 - (e) encouragement of indigenous systems of medicine.

- (ii) Explain the process of health planning in India by demonstrating awareness of various important milestones in the history of health planning including various committees and their recommendations.
- (iii) The health systems and health infrastructure at Centre, state district and block levels. The inter-relationship between community development block and primary health centre. The organisation, function and staffing pattern of community health centre, primary health centre, rural health centre and sub-centre etc.
- (iv) The job descriptions of health supervisor (male and female); health workers; village health guide; anganwadi workers; traditional birth attendants.
- (v) The activities of the health team at the primary health centre, Community health centre, district hospital.
- (vi) Health Insurance
- (vii) National Health Mission – Rural and Urban Component.

Health Management

- i. Familiarity with management techniques: define and explain principles of management; explain broad functions of management; personnel and materials management.
- ii. Finance Management: Budgeting systems
- iii. Explain general principles of health economics and various techniques of health management e.g., cost-effectiveness, cost-benefit etc.
- iv. Health Management Information System
- v. Be aware of the constitutional provisions for health in India.
- vi. Enumerate the major divisions of responsibilities and functions (concerning health) of the union, local and the state governments.
- vii. Appreciate the role of national, international voluntary agencies in health care delivery.
- viii. Appreciate the need for International Health Regulations and Disease surveillance.
- ix.
- x.
- xi.

Public Health Acts

Legal provisions protecting health of the community.

- 1. MTP Act, PNDA Act.
- 2. PFA Act
- 3. Acts regulating Organ Donation, Child adoption.
- 4. Prevention of Immoral trafficking Act.
- 5. Acts against substance abuse
- 6. Biomedical Waste Management Act and Acts protecting environment from pollution.
- 7. ESI Act, Factories Act.

Sociology

1. Conduction of a clinico-social evaluation of the individual in relation to social, economic and cultural aspects; educational and residential background; attitude to health, disease and to health services; the individual's family and community.
2. Assessment of barriers in health behaviour and identification of obstacles to good health, recovery from sickness and to leading a socially and economically productive life.
3. Development of a good doctor – patient relationship, public relations and community participation for health sectors.
4. Identification of social factors related to health and disease in the context of urban and rural societies.
5. Social Stratification and the value of the different methods.

Education Technology

1. General principles of teaching/learning, methods of instructions, methods of evaluation.
2. Various teaching aids (including a.v.aids) and skills to use them correctly.
3. Behavioral change communication strategy - Health education

Recent Advances

1. Newer vaccines
2. New screening/diagnostic methods applicable to public health problems
3. Role of New Technology in Community Health and provision of Care at various level.
4. Recent Policies, Acts, Programs.
5. Evolving diseases, Health issues.

5. TEACHING AND LEARNING METHODS

To achieve the stated objectives, various modalities and methods are commended:-The proportion of these modalities and methods will vary from Institution to Institution due to varying facilities for exposure and number of postgraduate students and recognized teachers. However, modality wise minimum exposure is suggested below:-

Field learning is facilitated through field postings during forenoons. Class room teaching to be planned in the afternoons at the department.

Class room learning:

- (1)Self-directed: At least twice a week in which the student will present articles, abstracts from journals, seminars, group work, epidemiological and statistical exercises, case studies, family presentation.
- (2)Lectures: Recognized teachers should take lectures..
- (3)Participation in scientific activities, Participation in Panel discussions, Symposia, debates, workshops, Conferences

Field posting and work

1. Posting at Urban and Rural Health Training Centres for a period of one year distributed throughout the three years.
2. Posting in the hospital for exposure to clinical departments namely Pediatrics, Gynaecology and Obstetrics, Medicine and Surgery for one month each.
3. Wherever possible work attachment at District Health Office and Directorate of Health Services
4. The students will be encouraged to attend various camps, melas, public health emergencies, Investigation of epidemics and implementation of National Health Programmes.
5. Visits to various institutions of Public Health Importance and related development organizations.

Teaching exposure

They should conduct group teaching of undergraduate students. They should participate in the training programme conducted by the Department.

Research

1. Thesis: The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

2. They should be involved in departmental research projects.
3. They should be encouraged to publish papers in scientific journals
4. They should be exposed to application of computers in medical science

ACHIEVING LEARNING OBJECTIVES: SKILL TRAINING STRATEGY

SUBJECT SPECIFIC PRACTICAL COMPETENCIES

Part I: General Skills

The postgraduate student should be able to :

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

Coded list of Skills:

	CATEGORISED ACTIVITY - CONTENTS	
S.No	DETAILS	PAGE NO
	HEALTH CARE	
HC1a	CLINICO-SOCIAL CASE STUDIES (Presented)	
HC1b	CLINICO-SOCIAL CASE STUDIES (Attended)	
HC2.	ANTENATAL CLINIC / LABOUR WARD / POSTNATAL CLINIC/	
	FAMILY PLANNING CLINIC	
HC3.	PAEDIATRIC CLINIC/ ADOLESCENT CLINIC/ GERIATRIC CLINIC	
HC4.	RNTCP CENTRE/ STI CLINIC/ ART CENTRE/ DERMATOLOGY	
	CLINIC	
HC5	NCD CLINIC/ OPHTHALMOLOGY CLINIC	
	PUBLIC HEALTH CARE	
PH1	COMMUNITY DIAGNOSIS	
PH2	PLACES OF PUBLIC HEALTH IMPORTANCE - VISITED	
PH3	OTHER PUBLIC HEALTH ACTIVITIES	
	EPIDEMIOLOGY	
EPI1a	JOURNAL ARTICLE PRESENTED	
EPI1b	JOURNAL CLUBS ATTENDED	
EPI2	PAPER / POSTER PRESENTATIONS	
EPI3a	LIST OF PUBLICATIONS	
EPI3b	PROJECTS ASSISTED	
EPI4	TIMELINE OF DISSERTATION/THESIS ACTIVITIES	
EPI5	SIMULATION EXERCISES	
	COMMUNICATION AND EDUCATION TECHNOLOGY	
C1a	UNDER GRADUATE CLASSES ATTENDED	
C1b	PAEDAGOGY SESSIONS	
C1c	UNDER GRADUATE CLASSES TAKEN	
C2	UNDER GRADUATE BLOCK POSTINGS (Community Orientation	
	Program)	
C3a	SEMINARS (PRESENTED)	
C3b	DEPARTMENT SEMINARS ATTENDED	
C4	TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS	
	CONDUCTED / ATTENDED	
C5	CONTINUED MEDICAL EDUCATION PROGRAMS (ATTENDED)	
C6	GUEST LECTURE- ATTENDED	

S.No	DETAILS	PAGE NO
	MANAGEMENT AND LEADERSHIP	
MLA1	HOSPITAL MANAGEMENT	
MLA2	OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3	
MLA3	OUT REACH CLINICS-RURAL / URBAN – National Program 4 & 5.	
MLA4	OUT REACH CLINICS-RURAL / URBAN – Materials Management.	
MLA5	OUT REACH CLINICS-RURAL / URBAN – Health manpower development	
MLA6	OUT REACH CLINICS-RURAL / URBAN – Health Management Information System.	
MLA7	OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation	
MLA8	MEDICAL AUDITS/ INFANT DEATH AUDIT/ MATERNAL DEATH AUDIT (Attended)	
MLA9	REVIEW MEETINGS (CONDUCTED/ATTENDED)	

Part II : Skills in Relation to Specific Topics

Documentation of training in each skill to be recorded in the logbook in the relevant coded section as given.

1. HEALTH CARE: Recognise and assist in management of common health problems of the community:

Skill	Activity	Quality assessment
a. Elicit the clinico-social history to describe the agent, host and environmental factors that determine and influence health. b. Adequate and appropriate treatment and follow-up	Case studies on patients with ADD, ARI, fever with no localising sign or symptom, Chronic cough, anaesthetic patches or deformities, (covering diseases like tetanus, malaria, filariasis, rabies, cholera, typhoid, intestinal parasites, leprosy, tuberculosis, HIV, Non communicable diseases like diabetes, hypertension) Cases could be obtained during their clinical postings or during their PHC & UHC posting – a minimum of 15 case studies	Documented case study reports with follow up to be reviewed by Faculty. HC1a and HC1b, HC2, HC3, HC4, HC5
c. Collection of appropriate material for microbiological, pathological or biochemical tests. d. Fixing, staining, and examining smears – peripheral blood smear for malaria and filariasis, sputum for AFB; Hb estimation; urine and stool examination.	Posting in laboratory where they should have performed the related simple tests. Minimum tests: Peripheral thick smear 1 Peripheral thin smear 1 AFB smear 1 Hb estimation 1 Stool exam for ova cyst 1	Document preparation of smears and their examination findings with confirmation from guiding faculty

e.. Advice on the prevention and prophylaxis of common diseases	Health advice to individual Health advice to small groups	Document context of health advice as counselling for all the 15 case studies in the GATHER (Greet, Ask, Tell, Help, Explain and Return) format. C4

2. PUBLIC HEALTH - Health Promotion and Disease Prevention

Skill	Activity	Quality assessment
a. Identify health problems of the community in the context of the socio -economic - cultural milieu	Family Study (Minimum 6) Community Diagnosis of a hamlet of 100 families assigned to each Postgraduate. (Research 1)	Record of detailed Family study report. (Guidelines available in Annexure) PH1c Based on survey of hamlet, details of COMMUNITY DIAGNOSIS to be provided in proper format PH1d
b. Use of proper screening methods in early diagnosis of common diseases.	To complete a project using / evaluating screening methods. (Research 2)	Study document should clearly justify the need for screening, the appropriateness of the test chosen for screening and the validity of the test. EPI3b5
c Identify groups which require special attention (elderly, adolescents, gender, the poor and other marginalized groups) including those facing occupational hazards	Based on the Community Diagnosis or a separate project, show how increased risk in groups can be identified.	Risk group identification should be documented either as a component of COMMUNITY DIAGNOSIS or as an independent research showing increased risk either as POR, OR, RR, Regression model or MVA. PH1e
d. Identify issues related to nutrition, life style	Component activity during Community Survey Quantifying and measurement of at risk lifestyles should be done either as part of community survey or as an independent qualitative research (Research 3)	Document on nutrition assessment should have indicators used for nutrition assessment of the community – both at individual level and family level. PH1f Documentation of result of lifestyle assessment. PH1g

e. Identify threats to the environment	Component activity during Community Survey	Document on environment PH1 assessment should state variables related to environment that were studied, how they were measured and the corrective action initiated.
f. Anticipate, prepare for and respond to disasters	Component activity during Community Survey.	Make a statement of risks the community is prone to, the infrastructure available for disaster preparedness, contact numbers of the local authorities in charge of disaster preparedness. PH1j
g. Take necessary steps in disease outbreak/epidemics/natural disasters – investigation of epidemic, food poisoning; notification; Organizing medical care following disasters.	To complete a project on investigation of an epidemic/ clustering of cases/ food poisoning (Research 3)	Study document should explain how the epidemic was suspected, confirmed and determinants identified. Details of management of epidemic & corrective action taken to be given PH3
h. On the basis of epidemiology of communicable and non-communicable diseases, plan preventive measures and manage national health programs	To prepare flow chart depicting Natural History of Diseases of Public Health Importance, giving opportunities for prevention, in the context of current status of population parameters and National program.	Report on level of prevention directly observed or practised and its consequences for a minimum of 5 National Programs. MLA1, MLA2
i. Facilitate inter-sectoral coordination for promoting health of communities	Make educational visits to various health related departments, updating current activities favouring health (TWAD board, TNPCB, Social Welfare Board, Aavin Milk Society, Veterinary Institute, Board for Rehabilitation of PWD, Prison Authorities, Airport and Seaport authorities)	Document report of visits along with contact number of liaison officers, especially for the field practice region assigned to the Post Graduate. PH2
f. Anticipate, prepare for and respond to disasters	Component activity during Community Survey.	Make a statement of risks the community is prone to, the infrastructure available for disaster preparedness, contact numbers of the local authorities in charge of disaster preparedness. PH1j

3. EPIDEMIOLOGY & BIOSTATISTICS: Use effectively the tools of epidemiology for understanding disease distribution and determinants of diseases

Skill	Activity	Quality assessment
a. Design and implement Epidemiological and Health Systems research studies	Dissertation project (Research 4)	Completed dissertation to be sent for external valuation. EPI4
b. Analyze data and present findings	- Component activity of dissertation. - Use statistical software for analysis of data. - Solve simulation exercises utilising various statistical methods.	Document solutions worked out for various simulation exercises. EPI5
c. Effectively document and disseminate findings	- Publish one original article. - Critically review journal articles.	- Document details of publication. EPI3a - Document details of journal club with articles critiqued. EPI1a, EPI1b

4. EDUCATION TECHNOLOGY: Behavioral Change Communication

Skill	Activity	Quality assessment
a. Assess the learning needs of any given group.	Component activity of COMMUNITY DIAGNOSIS	Documentation of Educational Diagnosis made in the context of societal or individual behavior problems that can be improved. PH1k
b. Formulate learning objectives.	- Plan a project on health communication to a special group. (Component part of community survey or independent study).	Document the small group BCC by stating the steps of Set Induction, Content/ Message of Communication, Motivators and System support during trial behaviour C4
c. Select and implement appropriate learning methods.		
d. Evaluate learning experiences.	Evaluation of BCC/learning session either individually or as a comparative evaluation of different types of health communication initiatives and BCC tools.	Document BCC evaluation report either as part of community survey/ following UG teaching session/ independent study comparing different health communication initiatives. EPI3b4
e. Plan curriculum and prepare curriculum materials.	- Prepare lesson plan for UG sessions conducted - Conduct peer reviewed microteaching sessions. - Plan & Organise Seminars	Document lesson plans and microteaching sessions with faculty evaluation. C1a, C1b, C1c, C2 Report on Seminars conducted C3a, 3b

5. Public Health policy, planning, leadership and Management

Skill	Activity	Quality assessment
a. Prioritize health problems, Set objectives; prepare action plan; implement programs; and monitor, supervise and evaluate them	Short term project/ training/ workshop/ Health Day Celebration/ Dept. Program to be planned and organised as a team.	Record of DEPARTMENT PROGRAM activity and its repercussions/ impact. EPI3b1
b. Plan health manpower development	Simulation activity of comparing existing health manpower of a chosen system against the required and prepare a feasible action plan for its development including costing	Record of Health manpower development action plan evaluated by faculty. MLA5
c. logistics and materials management	Simulation activity of material management (of any component activity of purchase, indend, storage, logistics, maintenance, documentation and condemnation) for any material essential for health care of a community (e.g. drugs, equipments, utilities like gloves, bins, electronic gadgets for HIMS, vehicle for transport of patients, students, health workers) based on the standard guidelines of the Director General of Health Services.	Report of materials management simulation report, evaluated by faculty. MLA4
d. Assess costs, plan, implement and supervise budget and alternative health options	As a component activity enclose costing and budget for the Management Project.	Work out simulation exercises on costing, budgeting and economic evaluation. EPI3b1
e. Perform economic evaluation of illness and health interventions	As an independent exercise to prepare report of economic evaluation of individual ill health/ population economics of health interventions Research 5	Report of economic research activity, evaluated by faculty to be enclosed. EPI3b3
f. Manage Health Information System and respond appropriately to the information gathered	Prepare a report of Management health information system at a specific centre, interpreting the findings and recommendations to correct the limitations.	Report on MIS to be evaluated by faculty and recorded. MLA6
g. Establish Surveillance System and respond to public health threats effectively and efficiently	Prepare a critical report on the existing surveillance/ HIS system for any specific region and give recommendations/ solutions in accordance with the standard guidelines. (One of SRS Unit, CRS, Regular Reports)	Report on surveillance system, evaluated by faculty to be enclosed. PH1i

h. Understand basics of hospital management	Components of hospital administration (Patient care OP, IP, Nursing, Pharmacy and Stores, Lab, Radiology, Operation theatres, Infection Control, Support services of Central Sterile Supply Dept., kitchen, laundry, Sanitation, Security, Hospital waste management, Records and Office Procedures, Grievance redressal) to be studied for any hospital, and report on the arrangement for monitoring and quality assurance of these components be prepared.	Report on components of hospital management with recommendations for problem solving to be documented with faculty evaluation. MLA1
i. Evaluate health care delivery	To evaluate health care delivery of a primary care centre/ sub centre based on NRHM guidelines (IPHS) for patient services offered, supervision and monitoring services, infrastructure in the form of buildings, manpower, drugs, equipment and furniture and Quality control in the form of availability of citizen's charter, standard guidelines, internal and external periodic records evaluation.	Health centre evaluation report to be documented.MLA7
j. Study quality assurance and medical audit.	Attend a medical audit/ Infant, Maternal death audit.	Report on audit as per guidelines. MLA8
k. Initiate, implement and supervise National Health Programs	Formative evaluation of any one of the National programs as per the guidelines.	Report of National Program evaluation to be documented after evaluation by faculty. MLA2, MLA3.
l. Understand and Implement public health laws	Trace one case study, from the list available in public domain, relating to violation of any one of the public health laws and discuss in detail the tenets of the law.	Report of case study on public health law.
m. Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector	One activity partnering with any of the NGOs, Corporate sector or private hospital in any aspect of national program or community project.	Report on Community, partnership project and its outcome. EPI3b2
n. Recommend policies relevant for the local community		

6. Ethics in Public Health

Skill	Activity	Quality Assessment
a. Identify and analyze ethical issues in public health practice, biological and medical research, and health policy with reference to the codes and regulations pertinent to clinical and research ethics	As a component activity for ALL the research activity undertaken.	Report on ethical issues in research conducted. EPI4d
b. Identify the beliefs and interests of stakeholders and their impact on ethical decision making in professional and research practice including those of public concerns.		Report on how interests of stake holders can influence conduct of the research planned by you and the ethics of it. EPI4e

**MD COMMUNITY MEDICINE
TRAINING SCHEDULE ENSURING COVERAGE OF LEARNING OBJECTIVES.
(Suggested)
FORENOON CLINICAL SESSIONS**

Month	I st year Postings	II nd year Postings	III rd year Postings
1	ObG/ Family planning HC1, HC2	PHC – 1 MLA3	Mentor for UG C2
2	Paediatrics HC3	PHC – 2 MLA3	Mentor for UG C2
3	Medicine HC5	Inst. Of Phys. Rehab/ NLEPHC4	PHC -1 MLA5
4	Psychiatry/ Geriatrics HC3	NRHM/ Health InsuranceEPI3b3	PHC – 2 MLA6
5	Diabetology Research 3	Data collection for dissertation Research 1	O/o Deputy Director of Hlth Services MLA8, MLA9
6	ICH Nutrition HC3	Corporation of Chennai MLA8, MLA9	UHC Research 5 EPI3b3
7	Dermatology/ Dental Hospital Administration MLA1	Communicable Diseases Hospital (CDH) PH3	PHC – 3 MLA7
8	Ophthalmology/ENTH C5	UHC PH1	UHC
9	PHC – 1	PHC – 3 MLA4	Department of Community Medicine.
10	PHC – 2 MLA2	ART/NIRT/RNTCP HC4	
11	PHC – 3 MLA2	Social Welfare/ Social Rehab PH2	
12	UHC MLA2	Special Vists Port/ Occupational health PH2	

AFTERNOON SESSIONS

Day	I year MD Community Medicine	II year MD Community Medicine	III year MD Community Medicine
Monday	Teaching Technology – Guided Practice of UG teaching - C1a	Epidemiology - EPI5	8 mths: Health care delivery 2 mths: International health 2 mths: Bio Ethics
Tuesday	Case Presentation - HC1a, HC1b	Teaching UG / Research – Guiding Data collectn & scrutiny: C1b	Health administration
Wednesday	Seminar/ Journal club/ Family Study/ Management Case Study - C1a, EPI1, PH1c.		
Thursday	3 mths: Social & behavioral science 3 mths: Environmental Health 3 mths: Medical Entomology 3 mths: Bio statistics	9 mths: Health care of special groups 3 mths: Nutrition	4 mths: Health Financing & Health Economics 8 mths Teaching UG/ Legal Aspects of health
Friday	Research methodology & Protocol development- EPI4c	6 mths Occupational Health 6 mths Disaster Management/ Injury	National Health Programs
Saturday	1st week - Log book evaluation by faculty i/c; PGs /Formative evaluation HOD in rotation. 3rd week – Special Lectures for 4th week – Log book evaluation by		

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

7. **Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

8. **Competency Assessment:**

OVERALL:

a) Communication / commitment / Contribution / Compassion towards patients and Innovation () 5 Marks

b) Implementation of newly learnt techniques/skills ()

Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks

Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks

No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

Viva Voce examination shall aim at assessing thoroughly depth of knowledge, logical reasoning, confidence and oral communication skills. It includes discussion on dissertation.

9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

Assessment:

There are 2 major components:

A) Formative Assessment : Ongoing evaluation during the course –

During each posting/ Module, learning activities are evaluated as given in the activity log, by faculty in charge at the end of each month and by HOD once every 3 months.

B) Summative Assessment: Final assessment after 3 years.

A. FORMATIVE ASSESSMENT/ (Ongoing Evaluation)

Formative assessment will be conducted during each posting/module/unit. This will include the following:

1. HEALTH CARE through documented case study reports with follow up.
2. PUBLIC HEALTH PROMOTION AND DISEASE PREVENTION through survey of hamlet and details of COMMUNITY DIAGNOSIS and recommendations provided.
3. EPIDEMIOLOGY & BIostatistics through solutions worked out for various simulation exercises, and epidemiology studies completed as research for dissertation, e journal publication, oral presentation at a conference and poster presentation.
4. EDUCATION TECHNOLOGY & Behavioral Change Communication through health communication to a special group and documented lesson plans for undergraduate classes
5. PUBLIC HEALTH POLICY, PLANNING, LEADERSHIP AND MANAGEMENT through Their analytical report and recommendations of the different components of management at the public health care units they are posted.

B. SUMMATIVE ASSESSMENT (FINAL ASSESSMENT)

10) THEORY EXAMINATION

Final Theory papers: 4 Papers each 100 marks

Paper I: History of Public Health, Concepts in Public Health, Epidemiology and Research Methodology and Communicable and Non-Communicable diseases

Paper II: National Programs and Environmental Health, Nutrition, RCH, Demography and Family Welfare, Primary Health Care system, Health Care Administration, Health Management and Public Health Leadership.

Paper III: Public Health Legislations, International Health & Global Diseases surveillance, Social & Behavioral sciences- applied aspects

Paper IV: Recent Advancements, Health planning, Education Technology. Information Technology, Integration of alternative Health system including AYUSH, Occupational Health

Question paper pattern: PAPER I, II, III & IV

Structured Essay Questions - 2 x 15 Marks = 30 Marks

Short Notes - 10 x 5 Marks = 50 Marks

Reasoning out - 4 x 5 Marks = 20 Marks

100 Marks

*The topics assigned to the different papers are given as general guidelines. A strict division of the subjects may not be possible. Some overlapping of topics is inevitable. Students should be prepared to answer the overlapping topics.

11) PRACTICAL

Practical/Clinical and oral examination:

The practical examination should be conducted over two days, not more than 8 post graduate students

per batch, per day as follows :

1. One long Family case from the community:

Socio-economic, demographic, cultural and holistic history taking, of the family to understand the

various risk factors affecting health and quality of life, assessment of social support system,

assessment of present morbidity and its implications, evolve interventions for medical relief and

social empowerment and role of family, community and primary health care system in resolving

family issues. This shall be conducted preferably in the community setting.

2. One long Case (30 minutes), 2 short cases (20 minutes each) – Cases with Communicable Diseases

Students will elaborate on clinico-epidemiological case history to assess the epidemiological

factors, precipitating factors, probable source of infection and evolve measures for diagnosis,

treatment, management with reference to the case as well as major public health concerns, i.e.

Control, prevention of the diagnosed disease and interventions in case of eminent outbreak /

epidemic situations. Short cases may be assessed without presentation of detailed history,

beginning with Differential Diagnosis in the given time.

3. Epidemiology and Statistics problem-solving exercises (5):

(Epidemiological – 3, Statistical – 2)

4. Public Health Spots (5) : including interpretation of analytical reports of water, food, environmental assessment and public health micro-biology

5. Viva-voce Examination

Oral/ Viva-Voce Examination shall be comprehensive enough to test the post graduate student's

overall knowledge of the subject.

TOPICS	Exercises	MARKS
CLINICO SOCIAL EXAMINATION	FAMILY STUDY :	60 MARKS
	One Long case	40 marks
	Intervention for Social Empowerment (Pedagogy)	20 Marks
PUBLIC HEALTH SKILLS	2 short cases	50 marks
EPIDEMIOLOGY BIO STATISTICS EXERCISE	Epidemiology and Statistics problem-solving exercises (5): 10 marks each	50 marks
OSCE (PUBLIC HEALTH CHEMISTRY) PH MICRO, MEDICAL ENTOMOLOGY, RCH SKILLS	Public Health Spots (5) 4 marks each	20 marks
VIVA		60 Marks
	TOTAL	300Marks
	Passing minimum	150 marks

	Forenoon	Afternoon
DAY 1	Family Study Long case	2 Short cases (pedagogy as part of family Study)
DAY 2	Epidemiological Exercise OSCE Log Book Evaluation Dissertation Discussion	VIVA

The practical examination should be structured and as objective as possible

A. Family study		(60 minutes)	80 marks
Structured Assessment			
1.	Oral skills/presentation with clarity of observations and decisions		20 marks
2.	Comprehensiveness of Diagnosis		20 marks
3.	Management based on related National Programs and Policies		20 marks
4.	Completeness of Appropriate Recommendations		20 marks

B. Epidemiology with applied biostatistics simulation exercises (60 minutes) 50 marks Exercises to test competency in statistics and its application in demography, RCH indicators, study designs, screening and diagnostics, materials management, money management, environment & entomology.

12. Log Book

The logbook is a record of the important activities of the candidates during his training. Collectively, log books are a tool for the evaluation of the training program of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

The Postgraduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

13. VIVA

G1. VIVA-VOCE including Competency Assessment 60 marks (40 marks+20 marks)

14. OSPE: 5 stations with checklists (10 minutes for each) 20 marks

Stations should evaluate competency relating to Public Health Entomology/ Microbiology/ Communication Skills/ Epidemiology and Research/ Environment Assessment (Public Health Chemistry)/ Clinical Diagnosis of Diseases of Public Health Importance

16. REFERENCE BOOKS:

Recommended reading:

Books

1. Public Health and Preventive Medicine (Maxcy-Rosenau-Last Public Health and Preventive Medicine) by Robert B. Wallace
2. Basic Epidemiology. R Bonita, R Beaglehole, T Kjellstrom. World Health Organization Geneva.
3. Epidemiology by Leon Gordis.
4. Oxford Textbook of Public Health. Holland W, Detel R, Know G.
5. Practical Epidemiology by D.J.P Barker
6. Park's Textbook of Preventive and Social Medicine by K.Park

7. Principles of Medical Statistics by A. Bradford Hill
8. Interpretation and Uses of Medical Statistics by Leslie E Daly, Geoffrey J Bourke, James MC Gilvray.
9. Epidemiology, Principles and Methods by B. MacMahon, D. Trichopoulos
10. Hunter's Diseases of Occupations by Donald Hunter, PAB Raffle, PH Adams, Peter J. Baxter, WR Lee.
11. Sathe PV and Sathe AP Epidemiology and Management for Health Care for All.
12. Vaccines by Stanley A. Plotkin.
13. All reports and documents related to all National Programmes from the Ministry of Health and Family Welfare.
14. National Health Programs of India 12th edition, by J. Kishore, Century Publication
15. Survey methods in community medicine – J.H Abramson
16. Principles of health care and management- Seth B. Goldsmith
17. A dictionary of public health – John M. Last
18. Infectious disease epidemiology 2nd edition – Kenrad E. Nelson
19. Biostatistics – The bare essentials 2nd edition – Norman streiner.

**** Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

17. JOURNALS

National

- a) Indian Journal of Community Medicine
- b) Indian Journal of Public Health
- c) Indian Journal of Community Health
- d) Journal of Communicable Diseases
- e) Indian Journal of Maternal and Child Health
- f) Indian Journal of Preventive and Social Medicine
- g) Indian Journal of Occupational Health and Industrial Medicine
- h) Indian Journal of Medical Research
- i) Indian Paediatrics
- j) Indian Journal of Paediatrics
- k) The National Medical Journal of India
- l) Journal of Vector Borne Diseases (previously Indian Journal of Malariology)
- m) Indian Journal of Environmental Health
- n) Indian Journal of Medical Education
- o) Journal of Indian Medical Association
- p) Journals of Medicine, Paediatrics, Obstetrics and Gynecology, Dermatology and Venereology, Leprosy, Tuberculosis and Chest Diseases
- q) Indian Journal of Dental Research

International

- a) WHO Publications – All
- b) Tropical Diseases Bulletin
- c) Vaccine
- d) Lancet
- e) British Medical Journal
- f) New England Journal of Medicine.
- g) BMC infectious diseases
- h) The Journal of Communicable Diseases
- i) Journal of Travel Medicine: official publication of the International Society of Travel Medicine and the Asia Pacific Travel Health Association
- j) The Lancet infectious diseases
- k) American Journal of Epidemiology
- l) International Journal of Epidemiology
- m) American Journal of Public Health
- n) Journal of Epidemiology and Community Health
- o) Population Reports
- p) The American Journal of Clinical Nutrition
- q) MMWR. Morbidity and mortality weekly report
- r) MMWR. Recommendations and reports: Morbidity and mortality weekly report Recommendations and reports / Centers for Disease Control
- s) MMWR. Surveillance summaries: Morbidity and mortality weekly report surveillance summaries / CDC
- t) Quality Management in Health Care
- u) Journal of Public Health Management & Practice.
- v) International Journal of Rehabilitation Research
- w) The Health Care Manager
- x) Health Care Management Review
- y) Current Opinion in Endocrinology, Diabetes and Obesity

Useful Websites

- a) www.icmr.nic.in
- b) www.mohfw.nic.in
- c) www.nacoonline.org
- d) www.npsindia.org
- e) www.tbcindia.org
- f) www.iapsm.org.in
- g) www.iphaonline.org
- h) www.who.int
- i) www.whoindia.org
- j) www.cdc.gov
- k) www.unicef.org
- l) www.pitt.edu/~super1 (supercourse epidemiology)
- m) <https://dish.tn.gov.in> (Directorate of Industrial Safety and Health)
- n) <https://nrhm-mis.nic.in> (HMIS, NRHM web portal)

LOG BOOK

BRANCH XV - M.D. (COMMUNITY MEDICINE) LOG BOOK PART I : DAILY ACTIVITIES

DEPARTMENT OF COMMUNITY MEDICINE
_____MEDICAL COLLEGE



PHOTO

NAME OF THE CANDIDATE: _____

UNI. REGISTER NUMBER : _____

TRAINED FROM _____ TO _____

DATE: ____ / ____ / 20____

SIGNATURE OF THE HOD

Introduction for Logbook
(To be included as 1 st page of logbook)

The log book is a record of the important activities of the candidates, during their training towards achievement of learning objective. It is a tool for the evaluation of the training program of the institution by external agencies. It is presented as two components one as a daily diary and the other as categorised activities.

The activities are categorised and coded as per specific learning objectives. The time table gives a rough guideline by highlighted 'codes' wherein the activity should be recorded.

A bound register may not give freedom of expression to the student. Maintaining each coded category in standard sheets in different folders would help manage activities performed over varying time periods.

The final presentation of log book should be in bound form all the folders maintained during the three years of study.

LOG BOOK – PART – I

S. No.	Date		Department	No. of Days on leave	Signature
	From	To			

Sig. of Professor/Associate Professor

Sig. of HOD

DETAILED DAILY ACTIVITY SHEET Page : MONTH : _____ 20 YEAR : I / II / III

S. No.	Day	Session	Activity	Signature of Faculty Remarks
		FN		
		AN		
		FN		
		AN		
		FN		
		AN		
		FN		
		AN		
		FN		
		AN		
		FN		
		AN		
		FN		
		AN		
		FN		
		AN		

Sig. of Professor/Associate Professor

Sig. of HOD

LOG BOOK – PART - II

	<u>CATEGORISED ACTIVITY - CONTENTS</u>	
S.No	DETAILS	PAGE NO
	HEALTH CARE	
HC1a	CLINICO-SOCIAL CASE STUDIES (Presented)	
HC1b	CLINICO-SOCIAL CASE STUDIES (Attended)	
HC2.	ANTENATAL CLINIC / LABOUR WARD / POSTNATAL CLINIC/	
	FAMILY PLANNING CLINIC	
HC3.	PAEDIATRIC CLINIC/ ADOLESCENT CLINIC/ GERIATRIC CLINIC	
HC4.	RNTCP CENTRE/ STI CLINIC/ ART CENTRE/ DERMATOLOGY	
	CLINIC	
HC5	NCD CLINIC/ OPHTHALMOLOGY CLINIC	
	PUBLIC HEALTH CARE	
PH1	COMMUNITY DIAGNOSIS	
PH2	PLACES OF PUBLIC HEALTH IMPORTANCE - VISITED	
PH3	OTHER PUBLIC HEALTH ACTIVITIES	
	EPIDEMIOLOGY	
EPI1a	JOURNAL ARTICLE PRESENTED	
EPI1b	JOURNAL CLUBS ATTENDED	
EPI2	PAPER / POSTER PRESENTATIONS	
EPI3a	LIST OF PUBLICATIONS	
EPI3b	PROJECTS ASSISTED	
EPI4	TIMELINE OF DISSERTATION/THESIS ACTIVITIES	
EPI5	SIMULATION EXERCISES	
	COMMUNICATION AND EDUCATION TECHNOLOGY	
C1a	UNDER GRADUATE CLASSES ATTENDED	
C1b	PAEDAGOGY SESSIONS	
C1c	UNDER GRADUATE CLASSES TAKEN	
C2	UNDER GRADUATE BLOCK POSTINGS (Community Orientation	
	Program)	
C3a	SEMINARS (PRESENTED)	
C3b	DEPARTMENT SEMINARS ATTENDED	
C4	TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS	
	CONDUCTED / ATTENDED	
C5	CONTINUED MEDICAL EDUCATION PROGRAMS (ATTENDED)	
C6	GUEST LECTURE- ATTENDED	

S.No	DETAILS	PAGE NO
	MANAGEMENT AND LEADERSHIP	
MLA1	HOSPITAL MANAGEMENT	
MLA2	OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3	
MLA3	OUT REACH CLINICS-RURAL / URBAN – National Program 4 & 5.	
MLA4	OUT REACH CLINICS-RURAL / URBAN – Materials Management.	
MLA5	OUT REACH CLINICS-RURAL / URBAN – Health manpower development	
MLA6	OUT REACH CLINICS-RURAL / URBAN – Health Management Information System.	
MLA7	OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation	
MLA8	MEDICAL AUDITS/ INFANT DEATH AUDIT/ MATERNAL DEATH AUDIT (Attended)	
MLA9	REVIEW MEETINGS (CONDUCTED/ATTENDED)	
	CURRICULUM SUBJECTS	
	POST GRADUATE CLASSES ATTENDED	
	COURSES ATTENDED	
	ANNEXURE – 1	

HEALTH CARE

HC1a. CLINICO-SOCIAL CASE STUDIES (Presented) (minimum 15) Page: ____

			Observation *			Name and
					Grade**	sign
						moderator
S.No	Cases	I	II	III	IV	
Date						
	presented***	(Clarity & organisation)	presentation style,ability to answer questions	content	Handouts	

*Scores:5-outstanding ;4-good ;3-satisfactory; 2- doubtful; 1-unsatisfactory **Grade: (total score) A:18-20; B:15-17; C:10-14 ;D:<10

*** Detailed case study to be documented along with health advice for each case study in GATHER format.

HC1b. CLINICO-SOCIAL CASE PRESENTATIONS (Attended) Page: ____

S.No.	Date	Cases presented by	Cases	Sign of Faculty

Health care of special groups: Knowledge acquired and activities undertaken to be given as a structured essay, including details of period, place of posting and guiding faculty, for the following clinics:-

HC2. Antenatal Clinic / Labour ward / Postnatal Clinic/ Family Planning Clinic
 HC3. Paediatric clinic/ Adolescent clinic/ Geriatric clinic
 HC4. RNTCP Centre/ STI Clinic/ ART Centre/ Dermatology clinic
 HC5. NCD Clinic/ Ophthalmology Clinic

EPIDEMIOLOGY**Epi 1a. JOURNAL ARTICLE PRESENTED Page: ____**

					Observation				Grade**	Sig. Of Faculty			
S.No.	Date	Journal Article presented	Journal Name	Volume, Year, Page	I (Clarity & Organisation)	II Presentations style, ability to answer questions	III Content	IV Hand outs					

Scores:5-outstanding ;4-good ;3-satisfactory; 2-doubtful; 1-unsatisfactory

**Grade: (total score) A:18-20; B:15-17; C:10-14 ;D:<10

Epi1b. JOURNAL CLUBS ATTENDED Page : ____

S. No	Date	Presented by	Journal Article presented	Journal Name	Volume, Year, Page	Sig. Of moderator

Epi 2. PAPER / POSTER PRESENTATIONS Page: _____

S.No.	DATE	TYPE	TOPIC	Name of the conference / Place	CREDITS	Awarded by	Sig. of Faculty
		PAPER / POSTER				TMC TN Dr. MGRMU Others :	

Epi 3a. LIST OF PUBLICATIONS Page: _____

S.No.	Journal	Title of the Paper	Authors	Year, Volume & Page No.	Sig. of Faculty

Epi 3b. PROJECTS ASSISTED Page:

S. No	Name of the Team members	TOPIC	Outcome	Sig. Of faculty
1		Department Workshop/ Health Day Celebration/		
2		Community partnership project		
3		Health economics research activity		
4		Research evaluating different health		
		communication strategy		
5		Research validating a screening test		

Epi 4. Timeline of dissertation/thesis activities

Date	Activity	Status	Sign. of Co-guide	Signature of Guide
	Research Methodology Training			
	Choice of Topic			
	Protocol draft			
	Analytical report on ethical issues in current research			
	Anticipatory analysis of how interest of state holders can influence conduct of research.			
	Protocol – presentation at department			
	Ethics Committee approval of protocol			
	Preparatory activities (permissions, print of forms, identifying liaison worker)			
	Data collection			
	Data entry & analysis			
	Final Report			

Epi 5. Simulation Exercises on epidemiology study designs/ management/ economics/ computer skills

S.No.	Category	No. of exercises worked out	Signature of Faculty
	Summarising indices		
	Graphs and Tables		
	Probability		
	Cross Sectional Studies		
	Analytical and interventional studies		
	Screening and diagnostic tests		
	Public health environment / entomology / Nutrition		
	Indicators of maternal, Child health and family welfare		
	Material and Financial Management		
	Computer Technology skills for data management		

PUBLIC HEALTH CARE

PH1. COMMUNITY DIAGNOSIS- CD

S.No.	Details	Report enclosed	Faculty sign
a.	Location		
b.	Total No. Of families		
c.	Families with detailed family study		
d.	Community diagnosis based on survey		
e.	Risk groups identified with justification		
f.	Nutritional assessment indicators		
g.	Lifestyle assessment report		
h.	Assessment of environmental factors		
i.	Existing surveillance system of the region		
j	Elements of disaster preparedness based on CD		
k	Educational diagnosis based on survey		

PH2. PLACES OF PUBLIC HEALTH IMPORTANCE – VISITED Page: ____

S. No	Institute name , Place	Subjects learned	Sig. of faculty

PH3. OTHER PUBLIC HEALTH ACTIVITIES (Epidemic management, Evaluation) Page: ____

S. No.	Date	Place	Activity	Sig. of faculty

COMMUNICATION AND TEACHING

C1a. UNDER GRADUATE CLASSES ATTENDED (as demonstration of communication skills) Page : _____

S. No.	Date	Topic	Sig. of faculty

C1b. PAEDAGOGY SESSIONS (as guided practice)

S. No.	Date	Topic	Students / Audience	Specific Skill

C1c. UNDER GRADUATE CLASSES TAKEN (independent practice) Page : _____

S. No.	Date	Year	Topic *	Sig. of faculty
		I / II / III / CRRI others _____		
		I / II / III / CRRI others _____		

* Detailed lesson plan for classes taken to be given

C2. UNDER GRADUATE BLOCK POSTINGS (Mentorship to UG) Page : _____ (Community Orientation Program)

S. No.	Date	Activities	Sig. of faculty

C3a. SEMINARS (PRESENTED) Page: ____

			Observation				Grade*	Name and sign moderator
S. No.	Date	Topics presented	I (Clarity & Organisation)	II Presentations style, ability to answer questions	III Content	IV Hand outs		

*Scores:5-outstanding ;4-good ;3-satisfactory; 2-doubtful; 1-unsatisfactory

*Grade: (total score) A:18-20; B:15-17; C:10-14 ;D:<10

C3b. SEMINARS ATTENDED Page: ____

S.No	Date	Department UG/PG	Topic	Presented by	Sig. of faculty

C4. TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS CONDUCTED / ATTENDED Page : ____

S.No	Date	Place	Partipants	Topic *	Sig. of faculty
		URBAN / RURAL			
		URBAN / RURAL			

* Document group sessions, stating the steps of Set Induction, Content/ Message of Communication, Motivators and System support during trial behavior

S.No	Date	Topic	Department / Place	Credits	Awarded by	Sig. of faculty
					TN Dr. MGR MU	
					Others :	

C5. CONFERENCES / WORKSHOP / NATIONAL SEMINARS ATTENDED Page: ____

C6. GUEST LECTURE- ATTENDED Page: ____

S.No	Date	Place	Topic	Name of the GUEST Lecturer	Sig. of faculty

MANAGEMENT/ LEADERSHIP AND ADMINISTRATION

Knowledge acquired and activities undertaken to be given as a structured essay, including details of management component analysed, with recommendations for problem solving period, place of posting and guiding faculty, for the following management perspectives:-

MLA1. Hospital Management

MLA2. OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3

MLA3. OUT REACH CLINICS-RURAL / URBAN – National Program 4 & 5.

MLA4. OUT REACH CLINICS-RURAL / URBAN – Materials Management.

MLA5. OUT REACH CLINICS-RURAL / URBAN – Health manpower development

MLA6. OUT REACH CLINICS-RURAL / URBAN – Health Management Information System.

MLA7. OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation

**MLA8. MEDICAL AUDITS/ Infant Death Audit/ Maternal Death Audit
(Attended) Page: ____**

SL. NO.	DATE	AUDIT	Sig. of moderator

**MLA9. REVIEW MEETINGS (CONDUCTED/ATTENDED) AS PART OF
MANAGEMENT TRAINING Page : _____**

Sl. No.	Date	Participants (CRRI / PG)	Topic	Sig. of faculty

POST GRADUATE CLASSES ATTENDED Page : _____

Sl. No.	No. of Sessions	Topic *	Class Taken by	Sig. of faculty

* Detailed schedule with dates of sessions to be available.

COURSES ATTENDED

Sl. No.	Date	Topic	Department / Place	Credits	Awarded by	Sig. of faculty
					TN Dr. MGR MU Others :	
					TN Dr. MGR MU Others :	

ANNEXURE – 1

Evaluation format for seminar presentations

	COMMENTS	SCORE
I. CLARITY & ORGANISATION: a) Begins by stating importance of topic, objectives & previewing main points. b) Presents 2 to 5 points clearly with supporting examples. c) Uses instructional resources d) Summarizes to achieve closure.		
II. PRESENTATION STYLE: a) Exhibits enthusiasm and stimulates interest in topic. b) Uses well modulated, clearly articulated speaking voice c) Presents without disturbing mannerisms d) Able to understand the questions and give appropriate answers		
BI. CONTENT: a) Organises content logically b) Uses up-to-date materials and references c) Presents content at appropriate level of complexity and quantity		
IV. HANDOUTS: Prepares appropriate supplementary resources		
TOTAL SCORE		

Scores: 5-Outstanding;4-Good;3-Satisfactory;2-Doubtful;1-Unsatisfactory

** Grade: (Total Score) A:18-20; B-15-17; C-10-14; D-<10


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M.D. / M.S.
POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM
2021 - 2022

M.S. GENERAL SURGERY


DEAN
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M.S. GENERAL SURGERY

1. GOAL / OBJECTIVES

- To practice surgery safely and effectively, backed by scientific knowledge and sound skills.
- To have a keen interest in patient care and develop caring attitude.
- To maintain high ethical standards.
- To have sufficient understanding of basic sciences related to surgery to diagnose and manage majority of the surgical conditions clinically and with the help of relevant investigations through comprehensive training and experience necessary for independence practice.
- To exhibit competence in the basic concepts of research methodology and teaching skills.

2. COMPONENTS OF THE POSTGRADUATE CURRICULUM

- THEORETICAL KNOWLEDGE
 - **PRACTICAL AND CLINICAL SKILLS**
 - WRITING THESIS / RESEARCH ARTICLES
 - ATTITUDES INCLUDING COMMUNICATION SKILLS
 - TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS
BIO ETHICS AND MEDICOLEGAL ASPECTS
- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
 - Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
 - Medical ethics, Bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.

3. **THEORY SYLLABUS**

POST GRADUATE M.S. DEGREE COURSE IN GENERAL SURGERY – BRANCH -I

ANAESTHESIA

- Premedication.
- Cardio Pulmonary resuscitation.
- Various types of regional anaesthesia.
- General anaesthesia – Intubation, maintenance and extubation.
- Anaesthesia in special circumstances like emergency, surgery metabolic derangements, Trauma etc.
- Management of Intractable pain.

RADIOLOGY AND RADIO THERAPY

- Technique of commonly done investigations in the Radiology department like plane x-ray both for bone and soft tissue.
- Technique of contrast x-rays in various systems in the body and their interpretation.
- Ultrasonogram.
- C.T. Scan.
- Practical Knowledge of Radio Therapy.
- Practical knowledge of telecobalt and other Linear accelerator and other types of irradiation.

ORTHO AND TRAUMA

(one month in Ortho and one month in Trauma Ward under Orthopaedic Surgeon)

- Principles and management of common fracture.
- Immobilization and plaster Technique.
- Correction of deformities of limbs.
- Diseases of bone and joints including tumours and infections
- Management, nerve, tendon and vascular injury.
- Management of Polytrauma.

CARDIO THORACIC

- Thoraco abdominal injuries.
- Intercostal drain.
- Thoracotomy and closure.
- Surgery of oesophagus, lung and pericardium
- Management of empyema.
- Fundamentals of open heart surgery and Bypass surgery.

NEURO SURGERY

- Management of head injury.
- Diagnosis and management of intra cranial tension
- Practical experience in burrhole and craniotomy.

UROLOGY

- Basic knowledge of endourology.
- Trauma related to Urology.
- Basic investigative aspects of uro-dynamics

PLASTIC SURGERY

- Facio Maxillary injuries.
- Various methods of Raw area coverage including Myocutaneous flap
- Reconstructive surgery for Breast and head and neck cancer.
- Cosmetic reconstructive surgery.
- Management of Burns.
- Bed Sore – prevention and management.

PAEDIATRIC SURGERY

One short note of 7 marks to be made mandatory in Paper 2

- Congenital anomalies – gastro intestinal, ano-rectal genitourinary tract etc.
- Management of intestinal obstruction in new born.
- Childhood malignancies.

GENERAL SURGERY

All facets of General Surgery including Endocrine Surgery (Viz. Thyroids, Adrenals etc. breast surgery, surgical Gastroenterology)

General Surgery including Surgical Pathology and applied aspects and Basic Medical Sciences.

4. TEACHING LEARNING METHODS

1. Lectures
2. Case based Discussions
3. Ward Rounds
4. Seminars
5. Journal Clubs
6. Bed side clinics
7. Interdepartmental meetings(Weekly with Radiology and pathology departments)
8. Clinical Society Meetings
9. Surgeon's Club

All Postgraduates should attend the Clinico-Pathological Conference (CPC) held every month and Clinical combined rounds and Clinical Grand rounds (CGR) which are held weekly. They are also encouraged to attend CME's, conferences and skill workshops

All the activities should be entered in a log book which should be signed by the authorized teacher and head of the department

5. STRUCTURED TRAINING PROGRAM

1. Inter-unit rotation of residents for upto 1 year

-Rotation of residents can be done for a period of 2 months in a different unit three times a year in the first year and second year(exclusive of speciality rotation)

Total time spent in rotation will be 6 months in first year and 6 months in second year. However in final year , residents are to spend all 12 months in their parent unit.

2. Rotation in sub-specialities for 6 months.

First year:

Time spent in parent surgical unit- 3 months

Time spent in interunit rotation- 6 months

Orthopedics and Trauma- 1 month

Neurosurgery- 15 days

Radiodiagnosis- 15 days

Plastic surgery- 15 days

Anesthesia- 15 days

Second year:

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

Time spent in parent surgical unit- 3 months

Time spent in interunit rotation- 6 months

Pediatric Surgery- 1 month

Urology- 1 month

Cardiology- 15 days

Vascular Surgery- 15 days

Third year

Time spent in parent surgical unit- 12 months

a) General Surgery	... 9 Months
b) Intensive Coaching	... 3 Months

Total	12 Months

Surgical Oncology, Vascular surgery, Endocrine surgery and Surgical Intensive care has to be taught by general surgery where concerned super specialty is not available

6. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

7. COMPETENCY ASSESSMENT:

- **OVERALL:**
- a) Communication / commitment / Contribution /
Compassion towards patients and Innovation () - 5 Marks
- b) Implementation of newly learnt techniques/skills ()
- **Number of cases presented in Clinical Meetings/
Journal clubs/seminars - 5 marks**
- **Number of Posters/Papers presented in Conferences/
Publications and Research Projects - 5 marks**

- No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks
-
- Total** **20 Marks**
-

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)
Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

8. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

9. THEORY EXAMINATION

PAPER I – Applied Basic Sciences in General Surgery

PAPER II – Surgery

PAPER III – Surgery including Traumatology

PAPER IV – Recent Advances

Question paper Pattern:

Paper I :	Write notes on	
i.	Anatomy	4 x 5 = 20
ii.	Physiology	4 x 5 = 20
iii.	Biochemistry	3 x 5 = 15
iv.	Pharmacology	3 x 5 = 15
v.	Pathology	3 x 5 = 15
vi.	Microbiology	3 x 5 = 15
Total =		100 marks

Paper II, III & IV :		
i.	Elaborate on :	2 x 15 = 30
ii.	Write notes on	10 x 7 = 70

Total = 100marks

10.PRACTICAL EXAMINATION

LONG CASE - (CASE SHEET WRITING + EXAMINATION- 30 MIN) (1 X 70 MARKS)	70 MARKS
SHORT CASE – (15 MIN EACH) (2 X 40 MARKS EACH)	80 MARKS
WARD ROUNDS (4 CASES X 10 MARKS EACH) (3 MIN EACH CANDIDATE)	40 MARKS
OSCE (5 STATIONS X 2 MARKS EACH) (3 MIN EACH CANDIDATE)	10 MARKS
TOTAL	200 MARKS (A)
VIVA VOCE (15 MIN EACH)	80 MARKS (B)
LOG BOOK (15 MIN EACH)	20 MARKS (c)
AGGREGATE (CLINICAL + VIVA) TOTAL	300 MARKS (A+B+C)
MINIMUM REQUIRED FOR PASS (50%)	150 MARKS
DISSERTATION	APPROVED / NOT APPROVED

Ward Rounds:

In Ward Rounds, two preoperative cases and two post operative cases to be discussed

11. Log Book:

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

12. VIVA including Competency Assessment

VIVA including Competency Assessment - 80 Marks (60 + 20)

Note : 3 stations each 20 Marks

- Radiology and Specimens
- Surgical Instruments and operative surgery
- Reason Advances

13. OSCE: 5 Stations to be attended

- Lab investigations
- Drugs and Suture material
- Clinical Scenario
- Surgical anatomy
- Communication skills - Ethics

14. RECOMMENDED LIST OF TEXT BOOKS & JOURNALS

- 1) Bailey and Love's Short Practice of Surgery
- 2) Book of Surgery (SABISTON) Volume I and II
- 3) Principles of Surgery by SCHWARTZ
- 4) Abdominal Surgery by MainGOT
- 5) Operative Surgery Charles Rob
- 6) Farquharson's Text Book of Operative Surgery
- 7) New Airds Companion to Surgical Studies
- 8) Jamieson and Key's Text Book of Surgical Physiology
- 9) Surgical Pathology by Boyd.
- 10) General Pathology by Waltair Isreal.
- 11) Last's Anatomy
- 12) Clinical Pharmacology by Laurence.
- 13) Clinical Pharmacology by Satoskar
- 14) Mastery of Surgery.
- 15) Ackerman's Surgical Pathology

- 16) Wilson: Watson – Jones Fractures and Joint injuries.
- 17) Surgical Pathology – By Illing Worth and Dick.
- 18) Clinical Bio-chemistry – Harper
- 19) Clinical Microbiology – Panikar
- 20) Minimal Invasive surgery by Dr. Palanivel
- 21) Emergency Surgery by Hamilton Bailey

**** Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

15. JOURNALS / WEBSITES

- 1) British Journal of Surgery
- 2) Annals of Surgery.
- 3) American Journal of Surgery.
- 4) Surgical Clinics of North America.
- 5) Diseases of Colon and Rectum.
- 6) Annals of Royal College of Surgeons.
- 7) Indian Journal of Surgery.
- 8) NCCN
- 9) upto date
- 10) Medscape
- 11) National Institute of Clinical Education


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M.D. / M.S.

POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM

2021 - 2022

M.S. OBSTETRICS & GYNECOLOGY


DEAN
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MS OBSTETRICS & GYNECOLOGY

1.GOALS

The goal of MD course in Obstetrics & Gynaecology is to produce a competent Obstetrician & Gynecologist who:

1. Recognizes the health needs of adolescents, females in reproductive age group & post-menopausal females
2. Is competent to manage the pathological states related to reproductive system with relevant knowledge of Anatomy, Physiology, Biochemistry, Pharmacology, Pathology, Microbiology and Virology.
3. Is aware of contemporary advances & developments in the field of maternal health & other related issues.
4. Is Oriented to the principles of research methodology and epidemiology
5. Has Acquired the basic skills in teaching of the Medical and Paramedical Professionals.

2.OBJECTIVES

A postgraduate resident should be able to achieve objectives in the following domains:

A. KNOWLEDGE

1. Learn the basics of the subjects of Obstetrics and Gynaecology, covering all conditions likely to be met in obstetric practice in our country.
2. Provide effective prenatal care depending on the clinical condition of the mother, including nutrition, immunization and risk assessment.
3. Learn in greater detail about common problems like hypertension complicating pregnancy, intrauterine growth restriction, cephalopelvic disproportion, obstructed labour and puerperal sepsis.
4. Appreciate the indications and methods of induction of labour.
5. Acquire thorough knowledge of gynaecologic conditions of public health importance such as cancer cervix and other gynaecological diseases likely to affect pregnancy.
6. Gain knowledge of other branches of medicine which are relevant to Obstetrics and Gynaecology with special stress on diabetes mellitus, hypertension, cardiac disease, anaemia, lower urinary tract disorders and medical and surgical causes of acute abdomen.
7. Aware of medico-legal aspects of practice of Obstetrics and Gynaecology.

8. Able to diagnose and manage normal pregnancy, labour and puerperium and recognize any departure from normal in the above.
9. Able to competently manage cases of abortion, spontaneous and induced, including ectopic gestation and gestational trophoblastic diseases.
10. Diagnose and manage preterm labour and assess the fetal well being, maturity and birth weight and to use that information in deciding the obstetric management.
11. Develop decision making skills by utilizing the clinical and laboratory data.
12. Able to diagnose and manage acute abdomen, haemorrhage in Obstetrics & Gynaecology and other emergencies i.e. eclampsia.
13. Able to medically treat common gynaecologic diseases specially using
 - i) Antibiotics
 - ii) Hormone therapy including contraception
 - iii) Ovulation inducing agents
 - iv) Antineoplastic drugs
14. Understand the need for common obstetric operative interventions i.e. episiotomy, forceps, ventouse, caesarean section, dilatation and evacuation etc.,
15. Understand the importance of population control, contraception and different methods of contraception.
16. Understand the physiology of menstruation and manage common menstrual abnormalities.
17. Identify common adolescent and paediatric gynaecological problems and their management.
18. Learn common causes of infertility and their management and assisted reproductive techniques.
19. Acquire knowledge about common gynaecological problems like leucorrhoea, sexually transmitted infections, displacements, fibroid, endometriosis etc.,
20. Learn about screening and diagnosis of gynaecological malignancies including that of the breast.
21. Acquaint oneself with common gynaecological operative procedures.
22. Learn the proper method of handling data and presenting statistics in a scientific and orderly fashion in seminars, symposia and papers.
23. Utilise journals and reference works effectively.

B. ATTITUDE

1. Appreciate the fact that women and children are especially a vulnerable group respectful maternity care as regards health problems.
2. Appreciate particularly the problem of patients of advanced and terminal disease and to develop a sympathetic attitude to them and their relatives.
3. Understand the psychological aspects of gynaecologic diseases in general and infertility and unwanted pregnancy in particular.
4. Develop the ability to view the patient's condition in a wider social perspective and to adjust therapy to suit her social and financial reality.
5. Understand the importance of good medical care in preventing most of the morbidity and mortality in Obstetrics and Gynaecology.
6. Develop skills to communicate with patients and their relatives and to elicit a thorough history and explain regarding investigations & management.
7. Understand that Obstetrics and Gynaecology form a hotbed for ethical issues and follow necessary precautions needed for an ethical practice.

C. SKILLS

1. Able to select cases for the following Obstetric procedures and able to perform them independently and confidently:
 - i. Lower segment caesarean section including cases of obstructed labour and malpresentations.
 - ii. Outlet and low forceps delivery
 - iii. Vacuum extraction
 - iv. Assisted Breech Delivery
 - v. External cephalic/internal podalic version
 - vi. Manual removal of placenta and exploration of uterine cavity.
 - vii. Management of atonic and traumatic postpartum haemorrhage.
 - viii. Post-partum IUCD insertion.
2. Able to perform safe and effective medical termination of pregnancy up to 20 weeks of gestation using methods of
 - i. Suction Evacuation / MVA
 - ii. Dilation and Evacuation
 - iii. Extra amniotic instillations & other newer methods like medical abortion

3. Able to perform the following gynaecological surgical procedures:
 - i. D & C / FC, Menstrual Regulation
 - ii. Polypectomy
 - iii. Minilap tubectomy
 - iv. Vaginal Hysterectomy with pelvic floor repair
 - v. Abdominal Hysterectomy for 'Straight-forward' cases
 - vi. Salpingectomy for ectopic pregnancy, Salpingo-ovariectomy
 - vii. Amputation of Cervix/Manchester repair / Conisation
 - viii. Ovarian cystectomy
 - ix. Myomectomy
4. Able to competently assist in the following:
 - i. Gynaecological Oncology surgery
 - ii. Gynaecological-urology surgery
 - iii. Tubal microsurgery
 - iv. Caesarean Hysterectomy
 - v. Hysterectomy in difficult cases
 - vi. Minilap tubectomy, laparoscopic sterilization
 - vii. Diagnostic laparoscopy/Hysteroscopy
 - viii. Colpocentesis/ colpotomy, laparotomy for septic abortion
 - ix. Cervical encirculation
5. Able to manage the post-operative and intra-operative complications.
6. Able to assist / perform the following investigations:
 - i) Obstetric Ultrasonography for
 - pregnancy dating
 - Early pregnancy bleeding
 - Antepartum haemorrhage
 - Biophysical profile
 - fetal anomalies
 - To read and interpret Obstetric Doppler of feto-placental circulation

- ii) Gynaecological USG for adnexal mass& follicular monitoring
- iii) Hysterosalpingography / sonohysterosalpingography
- iv) Colposcopy
- v) Cystoscopy

7. Able to resuscitate an asphyxiated newborn by emergency measures and recognize signs requiring referral of a baby for specialized care.

3. COMPONENTS OF THE POSTGRADUATE CURRICULUM

- ***Theoretical Knowledge*** –(Ref A – KNOWLEDGE’ under ‘OBJECTIVES’)
- ***Practical and Clinical Skills*** – Refer ‘C – SKILLS’ under ‘OBJECTIVES’
- ***Writing Thesis/Research Articles***

All students will have to carry out a research program and bring out a dissertation (thesis).

Students are encouraged to attend CMEs, publish research papers and present posters, or platform presentations at State, National and International conferences.

- ***Attitudes including Communication Skills***
 1. Appreciating Diversity
 2. Conflict Management
 3. Listening – Attention to detail
 4. Are you really listening ? – Picking up non-verbal cues
 5. Lost in translation – Communication within the team
 6. Case Scenario
 - a. Angry patient
 - b. Dealing with error made by college
 - c. Breaking bad news
 - d. Facilitating HIV status – disclosure to the patient and spouse

7. Respect to pregnancy and empathy towards malignant patients

• ***Training in Research Methodology, Medical Ethics/Bioethics and Medico-legal aspects .***

Students should compulsorily attend the research Methodology workshop conducted by the University within the first six months of the M.S course.

Students are encouraged to attend workshops/CMEs on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues are part and parcel of the curriculum and syllabus

ETHICAL DILEMMAS IN OBSTETRICS AND GYNAECOLOGY

A. At the beginning of life .

- Abortion - how do you make a legal / ethical decision taking into consideration all the laws and regulations, rights of the unborn child and the health of the mother.
- Infertility – Ethical issues of Assisted Reproductive Technologies – Donor programmes
 - Gamete cryopreservation
 - Embryo cryopreservation
 - Fertility preservation
 - Future of excess embryos

B. Contraception

- Autonomy of the individual
- Right to refuse
- Ethical issues of sterilisation being offered as a form of contraception

C. Counselling of parents with disease affected fetus.

A very difficult task in the event of diagnosis of conditions like Thalassaemia, Haemophilia, Down syndrome.

D. Ethical concerns of emerging medical technologies like Preimplantation Genetic Diagnosis for recurrent pregnancy loss and stem cell therapy.

E. Decision making process for surgery

Tubal recanalization – a multipara requesting the surgery in the hope of having a male baby.

Surgery for Gynaecological condition, knowing very well it does not improve quality of life.

4. THEORY SYLLABUS

OBSTETRICS& NEONATOLOGY

I. MATERNAL ANATOMY

1. Anatomy of pelvis
2. Embryogenesis
3. Development of placenta.
4. Anatomy of fetus, fetal growth & development, fetal physiology & circulation

1. ANATOMY OF PELVIS

Boundaries of Pelvis, Planes and diameters of Pelvis , Diameters: a) Inlet b) Midcavity c) Outlet d) Types of Pelvis: Gynaecoid, Android, Anthropoid, Platypelloid, difference between male and female pelvis, clinical significance of various types of pelvis eg: Android - failure of rotation and deep transverse arrest.

2. EMBRYOGENESIS

Gametogenesis:

Oogenesis, Ovulation, Implantation, Trophoblast formation - cytotrophoblast and syncytiotrophoblast formation, Decidua formation – decidua basalis, decidua capsularis, decidua parietalis, Chorion and chorionic villi – chorion and amnion, syncytiotrophoblast, primary stem villi, Structure of mature spermatozoa, Biology of Trophoblast, Embryology applied to in-vitro fertilization.

3. Development of placenta:

Structure of placenta – amniotic membrane, chorionic plate, basal plate, intervillous space and stem villi.

Placental circulation – Placental membrane (barrier) – no mixing of maternal and fetal blood.

Fetoplacental circulation – two umbilical arteries and one umbilical vein.

Function of the placenta – Transfer of nutrients, production and metabolism of hormones, barrier function, immunological function.

Haemodynamics of fetal circulation – Maternal

Placental Hormones – Human Chorionic gonadotrophin, ACTH, Relaxin, PTH-Rp, Growth Hormone Variant (hGH-V), GnRH, CRH, Leptin, Neuropeptide Y, Inhibin and Activin

4. ANATOMY OF FETUS, FETAL GROWTH DEVELOPMENT

a)Events of Fetal Development: Eg. 4-6 weeks limb buds, optic vesicles, 8 to 12 weeks external genitalia, 14 to 21 days Notochord, Neural plate. 21 to 28 days Neural tube, cardiac chambers, 36 weeks descent of one testis, 40 weeks descent of both testicles.

b) Fetal Physiology

Fetal nutrition, fetal haemopoiesis, urinary system, skin, gastro-intestinal tract, respiratory system, endocrine system.

c) Fetal Circulation

Changes in fetal circulation at birth : closure of umbilical arteries, lateral umbilical ligaments & superior vesical arteries. Closure of umbilical vein – ligamentum teres. Ductus venosus – ligamentum venosum, ductus arteriosus 1-3 months of birth, foramen ovale – 1 year of birth.

II. MATERNAL PHYSIOLOGY

I. MATERNAL CHANGES DURING PREGNANCY

- i) Changes in genital tract
- ii) Hematological changes
- iii) Metabolic changes
- iv) Cardiovascular system
- v) Respiratory system
- vi) Gastrointestinal system
- vii) Urinary system
- viii) Endocrine system

III. PRENATAL CARE

- 1. Diagnosis of pregnancy
 - In first, second and third trimesters
 - Details of symptoms and signs of pregnancy
 - Pregnancy tests
 - Details and accuracy
 - Details of dating of pregnancy with ultrasound
- 2. Details of Downs Screening
 - Nuchal thickness on ultrasound
 - Pros and cons of Downs screening
 - First trimester morphology
 - NIPT – Non invasive prenatal testing
- 3. Lab investigation in pregnancy
 - Rationale for these tests
 - OPT In / OPT Out screening for HIV
 - Role of urine culture, TSH
 - Screening for gestational diabetes
 - Role of Group B hemolytic streptococcus screening
 - Immunization – recommended vaccines, contraindicated vaccines

4. Assessment of risk factors
 - Relevant history
5. Morphology ultrasound
 - Commonly diagnosed anomalies
6. Examination
 - a) General – accurate BP measurement, Importance of examining spine, gait, thyroid and breast
 - b) Obstetric – symphysiofundal height (metrogram) charts, abdominal grips, pelvis assessment at term.
7. Drugs prescribed in pregnancy
 - Common drugs contraindicated in pregnancy
 - Teratogenicity of drugs.
8. Prenatal advice to women
 - Nutrition in pregnancy
 - Tips to expectant mothers.
9. Antepartum fetal surveillance
 - Use of ultrasound
 - Non stress test

IV. PHYSIOLOGY OF LABOUR AND PURPERIUM

Causation and stages of labour, role of hormones in labour,

Physiological and biochemical processes regulating parturition and induction of labour

a) MECHANISM OF LABOUR

- Cervical ripening, uterine distension, cardinal movements

b) CONDUCT OF NORMAL LABOUR

- Diagnosis of labour , management of 1st stage, management of 2nd stage, management of 3rd stage, drugs to prevent and treat PPH

c) INTRAPARTUM SURVEILLANCE

- Fetal surveillance, surveillance of uterine activity, PRAMS – post partum pregnancy risk assessment monitoring system, maternal early warning systems.

d) NORMAL PURPERIUM

Changes in the genital tract, uterus and other systems, lactation, care of puerperium.

Changes in the Genital tract & other systems, Changes in the uterus –involution and lochia, Lactation, Colostrum Physiology of lactation, Care of thePuerperium

Ambulation, bowel & bladder care, Breast, perineal care, Postpartum follow-up care.

PRAMS Postpartum - Pregnancy risk assessment monitoring system, Maternal early warning systems

V. COMPLICATIONS OF PREGNANCY

- Early pregnancy complication
- Anaemia in pregnancy
- Hypertensive disorders of pregnancy
- Antepartum haemorrhage
- Preterm labour
- Intrauterine growth restriction
- Prolonged pregnancy
- Multiple pregnancy
- Rhesus isoimmunisation

EARLY PREGNANCY COMPLICATIONS

Hyperemesis gravidarum, types of abortions, gestational trophoblastic disease, algorithm for evaluation, expectant management, staging and prognostic scoring, novel serum markers – VEGF, Creatine kinase

Ectopic pregnancy – Types, risk factors, clinical features, investigations.

Management – Medical, Surgical, conservative, algorithm for evaluation in expectant management.

ANAEMIA IN PREGNANCY

Iron deficiency, Folic acid & vitamin B12 deficiency, hemoglobinopathies, effects, investigations.

Management – iron therapy, oral and parenteral, blood transfusion, management of labour.

HYPERTENSIVE DISORDERS OF PREGNANCY

Classification, pathogenesis, preeclampsia, investigations, Predictive Test, Prediction models for preeclampsia (combination of biochemical, biophysical components and history) Chronic hypertension, HELLP syndrome, prophylaxis, management, role of uterine artery, umbilical artery, middle cerebral artery, ductus venosus, doppler in the management of preeclampsia.

HYPITAT trial, CHIPS trial,

ANTEPARTUM HAEMORRHAGE

Definition, differential diagnosis, Abruptio placentae, causes for maternal mortality, placenta previa – types and management. Internal iliac artery ligation (Use of stepwise devascularization)

PRETERM LABOUR

Etiology, Management – corticosteroids, tocolytics, preterm (PPROM) premature rupture of membranes, diagnosis, management, antibiotics, corticosteroids, Rescue therapy, atosiban, nitric oxide donors, Pros and Cons of prophylactic, therapeutic and emergency cervical cerclage, role of progesterone therapy, tocolysis, magnesium sulphate – neuro protection before 32 weeks.

FETAL GROWTH RESTRICTION

Definition, types, etiology, diagnosis, assessment and management, Ponderal Index , Doppler – middle cerebral artery, uterine artery doppler. TRUFFLE, GRIT, DIGITAT studies.

PROLONGED PREGNANCY

Definition, etiology, diagnosis and management, evaluation, modes of induction of labour.

MULTIPLE PREGNANCY

Incidence, varieties, presentation, course of pregnancy, diagnosis, complications, management of labour. Complications of monochorionic twins, Acardiac Twin (TRAP) sequence, Twin-Twin transfusion syndrome (TTTS). TAPS (Twin anemia polycythemia sequence), Selective reduction - LASER

RHESUS ISOIMMUNISATION

Factors influencing Rh immunization, Management of RH-immunised pregnancy. Non-invasive tests – MCA, PSV, Marie graph.

VI. MEDICAL DISEASES COMPLICATING PREGNANCY

- a) Diseases of the cardiovascular system
- b) Maternal infections during pregnancy
- c) Diabetes in pregnancy
- d) Tumors of the uterus and adnexa
- e) Surgical emergencies during pregnancy
- f) Liver diseases in pregnancy
- g) Diseases of urinary system

DISEASES OF THE CVS

Changes in the CVS system, types – congenital and rheumatic, functional grading – New York Heart Association, management during pregnancy, labour and puerperium, Prosthetic valves, Use of anticoagulants, Timing of anticoagulants, Complications in women with prosthetic valves.

MATERNAL INFECTIONS DURING PREGNANCY

TORCH infections, Sexually transmitted diseases, HAART therapy, other infections

DIABETES IN PREGNANCY

White's classification, pathophysiology, diagnosis, risk factors management – Diet, insulin, obstetric management, neonatal management, pregestational diabetes, GDM screening, use of oral hypoglycemics in pregnancy. HAPO trial, ACHOIS, IADPSG Recommendations, Oded Langer et al., N Engl J Med 2000, MiG Trial NEJM.

TUMOURS COMPLICATING PREGNANCY

Fibroids, ovarian tumours and carcinoma cervix, effects and management, chemotherapy in pregnancy,

SURGICAL EMERGENCIES

Acute appendicitis, intestinal obstruction, MANTRELS score.

LIVER DISEASES

Intrahepatic cholestasis – Use of ursodeoxycholic acid, AFLP, viral hepatitis, HELLP syndrome

DISEASE OF URINARY SYSTEM

Asymptomatic bacteriuria, acute renal failure, rational use of antibiotic therapy

VII. NEW BORN

- a) Resuscitation of new born
- b) Respiratory distress and neonatal sepsis
- c) Neonatal jaundice
- d) Neonatal problems and their management
- e) New born screening

NEW BORN

Resuscitation of the new born, neonatal sepsis, neonatal problems and the management, birth trauma

VIII. ABNORMAL LABOUR

Malpresentation, Dystocia, cephalo pelvic disproportion, Cardiotocograph findings. Categorization of cardiotocography – category 1,2,3

IX. THIRD STAGE COMPLICATIONS

Postpartum haemorrhage-etiology, predisposing factors, management, retained placenta, inversion of uterus, injuries to the parturient canal, rupture of the uterus, puerperal infection, venous complications, genital tract infections, mastitis and breast abscess, B-lynch suturing , internal iliac artery ligation, uterine tamponade – condom and Bakri balloon, stepwise devascularization, angiographic embolization, pelvic umbrella pack.

OBSTETRIC PROCEDURES

Forceps, Vacuum extractor, external cephalic version, internal podalic version, caesarean section, induction of labour, complications.

ULTRASOUND : Early pregnancy – diagnosis, dating, viability, multiple pregnancy, congenital anomalies, estimation of gestational age, fetal growth, fetal weight, liquor volume, fetal well being, Doppler.

FAMILY PLANNING

- X. Demography and population dynamics
- XI. Contraception
- XII. Emergency contraception
- XIII. Recent advances in contraception

XIV. DEMOGRAPHY AND POPULATION DYNAMICS

Population dynamics, factors involved, magnitude of the problem, impact of increased population. Vital statistics, maternal morbidities, perinatal mortality, early and late neonatal death.

XV. CONTRACEPTION

Temporary methods – Barrier methods : Condoms, diaphragm, chemical sponge(Today), natural contraception, IUCD, steroidal contraception, Oral – OCP, triphasic combined pills, mini pill, Newer OCPs, Parenteral – DMPA, NETO, Implants – norplant 1,2, Capronor, Silasticvaginal rings, Skin patches, Centchromin. Permanent methods : vasectomy, tubectomy, laparotomy, minilap, hysteroscopy, vaginal route.

EMERGENCY CONTRACEPTION

OCP, estrogen, levonorgestrel, mifepristone, centchroman, GnRH agonist, prostaglandins

MEDICAL TERMINATION OF PREGNANCY

MTP Act, grounds for performing MTP

RECENT ADVANCES, NEW DEVELOPMENT, FUTURE RESEARCH WORK IN CONTRACEPTIVE TECHNOLOGY

Immunological methods, male contraceptive

ETHICS IN OBSTETRICS & GYNAECOLOGY – MEDICO LEGAL ISSUES

PCPNDT Act – Preconceptionally and prenatal diagnostic test act

MTP Act

Fetal Anomalies – Decision regarding termination or continuation

Multiple Pregnancy – advice regarding fetal reduction

Modern O&G – Regarding ART – Eg. Removal of both ovaries for benign condition in the younger and middle age group women do not warrant removal of a normal uterus – Details

Consent

Consent forms for obstetric emergencies

Consent forms for sterilization eg. For lap sterilization

Conduct and training in conducting maternal and perinatal death audit.

MEDICO LEGAL ISSUES

- MTP Act
- PCPNDT Act
- Litigation for poor outcome, complications
- Importance of complete documentation
- Litigation after sterilization failure

- A. Permanent sterility B. Failure – 1% of patients conceive after sterilization C. May be converted to open surgery in the presence of unexpected problems, technical (or) Otherwise

For planned procedures & Laparotomy, if one is doing any procedure other than for which the consent was previously obtained, the surgeon or the Assistant must explain and get the consent for present procedure during the surgery itself.

Special Consent :Jehovah's witness, Mentally challenged, Unmarried, Medico legal cases.

OBSTETRIC ANAESTHESIA & ANALGESIA

NERVE SUPPLY OF FEMALE GENITAL TRACT

Sympathetic & Para sympathetic nerve supply of the female genital tract & its applied anatomy.

PHYSIOLOGY OF PREGNANCY

Physiological changes in pregnancy

PHARMACOLOGY

Pharmacology of drugs used in Obstetrics, Placental transfer of drugs.

LABOUR ANALGESIA

Various methods of pain relief in labour-.Pharmacological & Non-pharmacological methods, labour epidural analgesia.

ANAESTHESIA FOR OPERATIVE OBSTETRICS

GA, Spinal and epidural anaesthesia for LSCS surgery

ANAESTHESIA FOR LAPAROSCOPIC SURGERY

Anaesthetic implications of GA for Laparoscopic surgery

STATE HEALTH PROGRAMS/POLICIES

GYNAECOLOGY

I ANATOMY

Vulva, vagina, uterus, and cervix, fallopian tubes, ovaries, ureter, pelvic musculature, blood supply of genital organs, ovarian artery, uterine artery, vaginal artery, arteries of the vulva and perineum, lymphatic system, inguinal glands, parametrial glands, external iliac glands, common iliac, sacral groups, lumbar group, nerve supply- sympathetic & para sympathetic. Branches of the internal iliac and external iliac vessels, ligaments of the pelvis and supports of uterus

NORMAL HISTOLOGY

Ovary, cortex, Graffian follicle, corpus luteum, endometrium- proliferative phase, secretory phase, menstruation, vaginal epithelium – physiological changes.

II PHYSIOLOGY OF OVULATION AND MENSTRUATION

Hypothalamus, pituitary, ovary, estrogen, progesterone, physiology of ovulation, physiology of menstruation, Hormonal levels in different phases of menstrual cycle, neuro endocrine control of menstruation, role of prostaglandins.

III DEVELOPMENT OF FEMALE GENERATIVE ORGANS

Urogenital Sinus and external genital organs, primitive urinary system, lower end of Mullerian duct, external genital organs, development of ovary.

MALFORMATIONS OF THE FEMALE GENERATIVE ORGANS

Development of female generative organs, the urogenital sinus and the external genital organs, development of ovaries, Mullerian duct anomalies, developmental defects of the urogenital sinus, malformations of the rectum and anal canal, congenital rectovaginal fistula, Wolffian duct anomalies, renal tract anomalies.

IV GYNAECOLOGICAL DIAGNOSIS

History taking, menstrual history, obstetric history, physical examination, general examination, abdominal examination, gynaecological examination, speculum examination, pap smear, vaginal examination, rectal examination, investigations, preoperative investigations, Papanicolaou Test-classification(WHO/SIL Bethesda), Liquid based cytology, Cytohormonal Evaluation (Karyopyknotic index(KPI)),Uterine Aspiration cytology,Colposcopy, Endometrial Biopsy,Hormonal Assays,Ultrasonography, Others(CT,MRI, HSG),Gynaecological Endoscopy, Aspiration of Pouch of Douglas

V PAEDIATRIC AND ADOLESCENT GYNAECOLOGY

Pediatric Gynecology, Anatomy, Physiology, genitourinary system of Neonate, Congenital Anomalies, Infection, Tumors, Puberty & Adolescent Problems, Pubertal changes, Management, Precocious Puberty, Delayed Puberty, Oligomenorrhoea, Puberty Menorrhagia, Dysmenorrhoea, Vaginal Discharge, Acne, Unwanted Pregnancy,Tanner& Marshal staging, Neuro endocrinologic control of puberty.

VI DISORDERS OF MENSTRUATION

Menstrual cycle irregularities - Introduction, Definitions, Amenorrhoea, Primary – Classification, Etiology, Management, Secondary amenorrhoea - Etiology, Investigations, Oligomenorrhoea and hypomenorrhoea, Polymenorrhoea, Metrorrhagia, Dysmenorrhoea-Definition,etiology,types,varieties, Clinical features, investigations, Treatment, Premenstrual tension syndrome-Introduction, Etiology, Clinical features, Diagnosis, Treatment.

VII MENORRHAGIA AND DYSFUNCTIONAL UTERINE BLEEDING

Menorrhagia - Causes, General diseases, Local pelvic causes, Endocrine disorders- thyroid dysfunction, Contraceptives, Iatrogenic, Investigations, Management, General measures, Treating the cause, SERM(Ormeloxifene),_PALM COEIN classification,

DYSFUNCTIONAL UTERINE BLEEDING

Definition, Pathogenesis, classification-ovulatory,anovulatory, pubertal menorrhagia, metropathiahemorrhagica-pathological anatomy, irregular shedding, irregular ripening, diagnosis, treatment, conservative, medical &surgical, medical therapy- OCP, progestogen, danazol, NSAID,antifibrinolytics, GnRH analogue,MIRENA IUCD, Surgical- Curettage, Minimal invasive surgery, Hysteroscopic endometrial ablation(TCRE), Radiofrequency induced thermal endometrial ablation(RITEA), Cavaterm balloon therapy, Microwave endometrial ablation(MEA), Uterine tamponade, Endometrial laser intrauterine, thermotherapy(ELITT), Bilateral uterine artery embolization, Hysterectomy-Abdominal, Vaginal, Laparoscopic, LAVH. Von Willebrands disease, and other bleeding dyscrasias.

VIII FIBROMYOMA OF UTERUS AND UTERINE POLYPS AND ADENOMYOSIS

Fibromyoma types— intramural,submucous,subserous .Symptoms – menstrual disorders, infertility, pain, pressure symptoms,Complications, Degeneration, Torsion, Inversion, Infection, Treatment, Medical –GnRH analogues, danazol, mifepristone,surgery: Myomectomy—abdominal / vaginal / hysteroscopic / laparoscopic; Hysterectomy — ransabdominal/vaginal/LAVH/laparoscopic, Uterine artery embolization, uterine polyps, Endometrial polyp, Placental polyp, Management, Cervical fibroid.

IX ENDOSCOPY IN GYNAECOLOGY

Laparoscopy - Indications for Laparoscopy, Diagnostic laparoscopy, Operative laparoscopy, General indications, Other indications, Technique of laparoscopy, Complications, Hysteroscopy- Technique, Diagnostic indications, Therapeutic indications, Distension media in hysteroscopy, Contact hysteroscopy, Complications of hysteroscopy, Late complications, Salpingoscopy and Falloposcopy, Colposcopy, Indications, Therapeutic, Technique of Colposcopy, Colposcopic findings, Abnormal findings, Colpomicroscopy, Extragenital Endoscopy, Fluid Management, Hysteroscopy, Endometrial Ablation.

X GENITAL PROLAPSE

Supports of genital tract, Dancey 3 levels of support, Etiology, POP-Q classification of prolapse, Birth injuries, menopause, Classification of Prolapse- Anterior vaginal wall, Posterior vaginal wall, Uterine descent, Procidentia, Symptoms of prolapse, Investigations, Differential diagnosis, Anterior vaginal wall cyst, Chronic uterine inversion, Congenital elongation of cervix, Complications of Prolapse, Prophylaxis & Management, Conservative-pessary, Surgery, Vaginal hysterectomy, Anterior & Posterior colporrhaphy&Colpoperineorrhaphy, Fothergills repair, Abdominal sling surgery, Vault prolapse, Recurrent prolapse, Details of Sling Surgeries – Abdomino cervicopexy, Pelvic reconstructive surgery, Synthetic materials, Biological Materials, New system, (Intra vaginal sling plasty, Apogee, Perigee),

XI DISEASES OF URINARY SYSTEM

Common Urinary Malfunctions 1.Acute Retention of Urine- Causes, Management 2.Chronic retention- Causes, Management 3.Retention of Urine due to retroverted gravid uterus, Management 4.Urethral Syndrome 5.Difficult Micturition 6.Painful Micturition 7. Increased Frequency of Micturition 8.Incontinence of Urine 9.Cystitis-Micro Organisms, Mode of spread, Symptoms, Diagnosis, Treatment ,Diseases of the female urethra, Urethritis, Urethral caruncle.

Urethral prolapse, Urethral Diverticulum, Urethral Stenosis, Urinary Fistulae, Genital Fistulae, Definition, Etiology, Anatomic Classification of Urinary Fistulae, Clinical Features - Investigations, Management, Latzko Procedure, Chassar Moir technique, Vaginal/transvesical / transabdominal Approach, ileal loop bladder, Postoperative Management - Ureteric fistulae, Causes, Diagnosis, Management-Percutaneous nephrostomy, Cystoscopic catheterization & stenting, Boari-flap operation, Ureteroneocystostomy, Urethrovaginal Fistula, Stress urinary incontinence, Mechanism of Female Urinary Incontinence - Genuine stress incontinence, Urge incontinence, Clinical Evaluation, Investigations, Stress test, Cotton swab stick test, Marshall and Bonney's test, Urethroscopy, Urodynamic evaluation, MRI studies, Treatment-Conservative, Surgical, Vaginal/Abdominal/combined Approach, Complications, Outcome following surgical repair, Detrusor instability-Etiology, Pathophysiology, Symptoms, investigations,Treatment. Physiology of micturition, Pregnancy & urinary problems, Urodynamic studies, cystoscopy. Burch Colposuspension, Tension free vaginal T-tape, Injectable Bulking agents, Botox Injection, Augmentation cystoplasty, Neuro Modulation.

XII SEXUALLY TRANSMITTED DISEASES

Condylomata acuminata, Genital ulcers, Genital Herpes, Chlamydia, syphilis, gonorrhoea, LGV,granulomainguinale, Human Immunodeficiency Virus.

XIII PELVIC INFLAMMATORY DISEASE

Etiology, Pathological Anatomy, Stages of PID, Clinical criteria for diagnosis of PID, Acute/chronic Signs & Symptoms, Differential diagnosis, Treatment, Acute PID-Medical/Surgical/ Minimal Invasive Surgery, Chronic PID-Surgery Laparoscopic/Hysteroscopic/Conservative Surgery, Prophylaxis Against PID, Actinomyces PID, Tuboovarian mass, CDC guidelines for treatment of PID.

XIV TUBERCULOSIS OF GENITAL TRACT

Primary sources of infection, mode of spread, Bacteriology, Pathology, TB Fallopian tubes-Exosalpingitis{tobacco pouch appearance and Frozen pelvis} and endosalpingitis, Symptoms of TB genital tract. Infertility, menstrual disorders, fistula Formation, Investigation, Treatment of genital TB.

DISEASES OF VULVA AND VAGINA

VULVA - Benign conditions, Atrophy, Dystrophies-Histological classification and clinical Features, Cysts and neoplasms-Bartholin's cyst.

Vagina - Leucorrhoea, Infections-Gonococcal, trichomonas, monilial, chlamydial, bacterial vaginosis, Vaginitis-Senile vaginitis, Secondary vaginitis, Cysts, Gartner's cyst, Vulval infections, clinical features, diagnosis & management.

XV MENOPAUSE AND POST MENOPAUSAL BLEEDING

MENOPAUSE – Definition, Hormonal changes, Anatomical changes, Symptoms, menstrual, neurological, genitourinary tract, Investigations-PAP smear. Management-Hormone replacement therapy-estrogen, progestogen, raloxifene; soya, bisphosphonates, Post menopausal bleeding-Definition, etiology, investigations-USG –Endometrial thickness, Fractional curettage, endometrial sampling, hysteroscopic biopsy, management, estrogen transdermal patch, HRT and bone mineral density.

XVI INFERTILITY

Issues involved, Male infertility - Spermatogenesis, Endocrine control, pathology, Etiology, Investigations, History, General & Local Examination, Special investigations -Semen analysis hormone assay, testicular biopsy, Immunological test, Patency of vas, Chromosomal study, Management - Education, substances abuse, correct endocrinopathies, surgical, antibiotics, Hormones (HCG, Testosterone, GnRH) Sildenafil, artificial insemination, Intra uterine insemination.

Management of azoospermia - ICSI, TESA, PESA, MESA, TESTICULAR BIOPSY

Psychological considerations

Female infertility: Etiology, Investigations, History, examination, special investigations, Tests for tubal patency(HSG, Laparoscopic chromotubation, SSG) Management of Tubal infertility Tubal microsurgery(tuboplasty), Laparoscopic tubal adhesiolysis, fimbrioplasty, IVF, Tests for Ovulation -BBT, endometrial biopsy, fern test , USG, Hormonal study, Management of anovulation -Ovulation induction drugs, Gonadotrophins, Dexamethasone, laparoscopic drilling. Management of Peritoneal disorders, Endometriosis, unexplained infertility, Ovarian reserve tests: FSH, AMH, AFC. Legal aspects of ART: ART bill ; ICMR regulations, Post coital test (Sims test) Sperm penetration test, Y deletion genetic tests, CFTR testing.

IVF TECHNIQUES (Indications, complications), GIFT, ICSI, Epididymal aspiration. Newer modalities - Hysteroscopy, Falloposcopy, ampullary and fimbrialsalpingoscopy, Laparoscopy for endometriosis. ART (indications, types)

Recent advances in infertility: Pre-implantation genetic testing (PIGT) and Diagnosis.

ENDOMETRIOSIS

Etiology, Genetic factors, Mutation, Aneuploidy, Immunological factors & inflammation, Endocrinological abnormalities, Endometriosis of the rectovaginal Septum, adenomyosis, Medical treatment -Non hormonal Therapy, Modulation of Cytokines, Leukotriene Receptor, antagonists(Pentoxifylline), Inhibition of matrix metalloproteinases, hormonal therapy - Progesterone, Onapristone, Mifepristone, Aromatase, inhibitors, SERM- Raloxifene, Future research(Rat & Rabbit animal Models, Role of laparoscopy.

XVII GESTATIONAL TROPHOBLASTIC DISEASES

Hydatidiform mole, incidence, pathology, invasive mole, placental site trophoblastic tumour, symptoms and signs, investigations, ultrasound, serum beta HCG, treatment, follow up, persistent trophoblastic disease, recurrent molar pregnancy, choriocarcinoma, Pathology, Signs and symptoms, FIGO staging, Treatment—chemotherapy (triple therapy, EMACO)/surgery, Follow up.

XVIII DISORDERS OF THE OVARY AND BENIGN TUMORS

Non neoplastic enlargements of the ovary, Follicular cysts, Follicular haematomas, Lutein cysts of the ovary, functional cysts, Polycystic ovarian syndrome (PCOS) or disease (PCOD), Ovarian Tumors, Pathology, Borderline ovarian Tumors, Characteristics of borderline ovarian tumors, Risk factors, Pathology, Tumors of the surface epithelium- Serous cystadenoma and cystadenocarcinoma ,Mucinous tumour, Endometroid tumour, Mesonephroid tumour, Brenner tumour, Spread of epithelial tumors of the ovary, Germ cell

Tumour, Incidence, Teratoma Dermoid cysts, Solid teratoma of the ovary struma ovarii, Carcinoid tumors, Dysgerminoma Mixed germ cell tumour, Sex cord stromal Tumour, Feminizing tumours of the ovary, Granulosa cell tumour, Theca cell tumour, Virilizing ovarian tumours -Mesenchymoma, Arrhenoblastoma, Adrenal cortical tumor of the ovary, Hilus cell tumor, Gynandroblastoma, Tumor Arising from connective Tissues of Ovary- Ovarian fibroma, Histogenesis of ovarian tumors, Complications of ovarian tumors, Benign ovarian Tumors - Symptoms, physical signs, Differential diagnosis, Investigations, Treatment.

XIX GYNAECOLOGIC ONCOLOGY

Cancers of the Genital Tract, Cancer of the Vulva, Preinvasive lesions, Invasive carcinoma of the vulva (FIGO staging) management, Vaginal cancer, Clinical features, Staging, Diagnosis, Management Carcinoma of the cervix, Cervical intraepithelial neoplasia, Metaplasia, Dysplasia, preinvasive cervical cancer (stage0), Invasive cancer of the cervix- signs, symptoms & staging, invasive cancer cervix in Pregnancy (abnormal pap smear in pregnancy), management & treatment - Endocervical cancer, Carcinoma of the Uterus and Endometrial Cancer, Predisposing factors, Surgery Postoperative radiotherapy, Primary radiotherapy, Progestogens, Recurrent growths, Uterine sarcomas, Fallopian Tube Cancers, FIGO staging, Clinical features, Differential diagnosis, Investigations, Management, Prognosis of Ovarian Cancer, FIGO staging, Epithelial cancers of the ovary, Non-epithelial malignancies of the Ovary, Sex cord stromal tumors, Metastatic carcinomas, Management-staging Laparotomy, Strategies to Reduce the Incidence of Genital Tract Malignancies, (Prophylaxis), Palliative and adjuvant therapy.

Vulval sarcoma, melanoma, Bartholin gland tumour, Pap smear & classification, Colposcopy, cervicography, VIA , Cone biopsy, Radical Hysterectomy, Pelvic Lymphadenectomy, Laser ablation, LLETZ, LEEP, Radiotherapy, HPV vaccine, Histological classification & grading, Endometrial Carcinoma, Uterine sarcoma.

VIN classification, Paget's disease, Bowen's disease, Sarcoma botryoides, Etiology and management, AgNOR, HPV testing & HPV Vaccine, Nerve-Sparing Radical Hysterectomy, Prognostic Variables, Adjuvant Radiation, Neoadjuvant Chemotherapy, Recurrent cervical cancer, Aspiration cytology, Prognostic Variables.

Risk factors, criteria for diagnosis of borderline tumors, Krukenberg tumor, Second look laparotomy, Stem cell therapy.

IMAGING MODALITIES IN GYNAECOLOGY

Plain Radiography, Hysterosalpingography, Sonosalpingography, Intravenous Urography - Indications, Precautions and contraindications, Cystography and Urethrography, Gastrointestinal studies, Barium meal and follow through Barium enema, Arteriography and arterial Embolization, Ultrasonography, Transabdominal Ultrasonography, Transvaginal ultrasound, Diagnostic indications, Therapeutic applications of ultrasonography in clinical practice, Computed Tomography Scan - Technique, Indications, Magnetic Resonance Imaging, Indications, Contraindications, Radionuclide Imaging, Dual Photon Densitometry.

OPERATIVE GYNAECOLOGY

Principles of Anatomy & Perioperative considerations, Surgical Anatomy of Pelvis, Pre operative care, Post Operative care, Principles of Gynaecological Surgical Techniques, Incisions for Gynaecological surgery, Surgery for Fertility, Reconstructive Tubal Surgery, Surgery For Benign Gynaecologic Conditions, Surgery for Anomalies of the Mullerian duct, Suture Material & Surgical Instruments, Water, Electrolyte & Acid-Base Metabolism, Diagnostic and Operative Laparoscopy, Operative Hysteroscopy, Application of Laser in Gynaecology.

SURGERY OF THE MULLERIAN DUCTS

Vaginoplasty, 1 Mc Indoe Operation 2.Williams Vulvovaginoplasty, Tubal Sterilization, Surgical Approach, 1.Minilaparotomy 2.Laparoscopy 3.Tubal Occlusion Vasectomy, Surgery for Benign Disease of the Ovary, Resection of Benign cysts, Leiomyomata Uteri and Myomectomy, Medical Management of Uterine Leiomyomata, Abdominal Myomectomy, Assisted reproductive techniques, Surgical Technique for Uterine Unification - 1.Modified Jones Metroplasty 2. Tompkins Procedure 3.The Strassman, Metroplasty

HYSTERECTOMY

1. Abdominal Hysterectomy, Indications, Preoperative counselling, Preparation for Hysterectomy, Complications, Post Operative care, 2.Vaginal Hysterectomy – Indications, Preoperative counselling, Preparation for Hysterectomy, Operative Technique, Complications, Post Operative care, Hysterectomy - 1.Laparoscopically assisted vaginal hysterectomy (LAVH), 2.Laparoscopic subtotal hysterectomy (LSH)

3.Laparoscopic hysterectomy (TLH), Staging system for Laparoscopic hysterectomy,

SURGERY FOR CORRECTIONS OF DEFECTS IN PELVIC SUPPORT

Pelvic Organ Prolapse, Anatomic considerations, Clinical Evaluation, Pelvic Organ Prolapse-Quantification system (POP-Q), Baden-Walker system, SITE-Specific Repair, Cystourethrocele, Paravaginal Defect Repair, Posterior Compartment defects,

VAGINAL VAULT PROLAPSE

1. McCall Culdoplasty, 2.Sacrospinous Ligament Fixation 3.Abdominal Sacral Colpopexy, Non surgical treatment for pelvic organ prolapse—use of vaginal pessaries, High utero Ligament Suspension, Iliococcygeus Fascia Suspension, Le Fort Colpocleisis, Vesico Vaginal Fistula.

CANCER OF THE CERVIX

Surgical treatment for early stage cervical cancer, Concept of radical abdominal hysterectomy and bilateral pelvic lymphadenectomy,

ADJUVANT THERAPY IN CONJUNCTION WITH RADICAL SURGERY

ENDOMETRIAL CANCER

SURGICAL STAGING AND TREATMENT

OVARIAN CANCER

Comprehensive surgical staging, Surgical staging for apparent early stage ovarian cancer, Primary cytoreductive surgery, Neoadjuvant chemotherapy and interval cytoreductive surgery, Laparoscopically assisted radical vaginal hysterectomy. (SCHAUTA), Second look laparotomy, Secondary cytoreductive surgery.

Environmental:

1. **Safe disposal of Bio-medical waste**
2. Universal precautions in sero-positive cases (HIV and HbsAg)

5. TEACHING LEARNING METHODS(including Clinical Study)

1. Seminars / Symposia
2. Journal Clubs
3. Group Discussions
4. Clinical rounds / combined case discussions
5. Case presentations / Bedside teaching
6. Maternal care review meetings – State review maternal mortality meeting
7. Perinatal meetings – State level maternal mortality meeting
8. Clinicopathological meetings
9. Attending conferences, Workshops, CME programmes etc.,

A) Active involvement in patient care in

- Antenatal clinic
- General Gynae – OPD
- Postnatal clinic
- Infertility clinic etc.,
- Adolescent clinic

B) Operation Theatre

- Assist procedures
- Operate under supervision
- Operate independently
- Emergencies – Participation in Management
- In the community – visits to RHC / CAMPS

6. STRUCTURED TRAINING PROGRAMME

CLINICAL POSTINGS -THREE YEAR MS OG			
	I Year	II Year	III Year
L.Ward	3 months	3 months	3 months
AN/PN Ward	3 months	3 months	3 months
Gyn/P.O Ward	3 months	3 months	3 months
Anaesthesia		15 days	15 days
Paediatrics		1 month	
Medicine	1 month		
Surgery & Urogynaecology	15+15 days	15 days	
FW		15 days	15 days
Infertility & USG	15 days	15 days	
Colposcopy & Pathology		15+15 days	
Radiotherapy			7 days
Oncology			7 days
Endocrinology			7 days
Genetics			7 days
Social Obstetrics			1 month

Clinical Postings-Two year MS OG

	I Year	II Year
L.Ward	3 months	3 months
AN/PN Ward	3 months	2 1/2months
Gyn/P.O Ward	3 months	2 1/2months
Anaesthesia		15 days
Paediatrics	15 days	
Medicine	1 month	
Surgery & Urogynaecology	15+15 days	
FW	15 days	15 days
Infertility & Sonar		15 days
Colposcopy & Pathology		15days
Radiotherapy		7 days
Oncology		7 days
Endocrinology		7 days
Genetics		7 days
Social Obstetrics		1 month

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

8. COMPETENCY ASSESSMENT :

• OVERALL:

a) Communication / commitment / Contribution /	()	
Compassion/respect towards patients and Innovation	()	- 5 Marks
b) Implementation of newly learnt techniques/skills	()	
• Number of cases presented in Clinical Meetings/ Journal clubs/seminars		- 5 marks
• Number of Posters/Papers presented in Conferences/ Publications and Research Projects		- 5 marks
• No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details		- 5 marks
Total		20 Marks

PG CLINICAL COURSE

VIVA including Competency Assessment - 80 Marks (60 + 20)
(Obstetrics-30marks &
Gynaecology -30 marks)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper.

10. THEORY EXAMINATION

There should be four theory papers, as given below:

Paper I: Applied Basic sciences.

Paper II: Obstetrics including social obstetrics and Diseases of New Born

Paper III: Gynaecology including fertility regulation

Paper IV: Recent Advances in Obstetrics & Gynaecology

Question paper Pattern:

Paper I : Write notes on

i.	Anatomy	$4 \times 5 = 20$
ii.	Physiology	$4 \times 5 = 20$
iii.	Biochemistry	$3 \times 5 = 15$
iv.	Pharmacology	$3 \times 5 = 15$
v.	Pathology	$3 \times 5 = 15$
vi.	Microbiology	$3 \times 5 = 15$

Total = 100 marks

Paper II, III & IV :

i.	Elaborate on :	$2 \times 15 = 30$
ii.	Write notes on	$10 \times 7 = 70$

Total = 100 marks

11. PRACTICAL EXAMINATION

MS OBSTETRICS & GYNAECOLOGY

			CLINICALS	
LONG CASE			1 OBSTETRICS	50 MARKS
			1 GYNAECOLOGY	50 MARKS
SHORT CASE			1 OBSTETRICS	25 MARKS
			1 GYNAECOLOGY	25 MARKS
WARD ROUNDS- 3 CASES X 10 MARKS EACH				30 MARKS
ANTENATAL, FAMILY WELFARE, GYNAEC.				
OSCE- 4 STATIONS X 5 MARKS EACH				20 MARKS
TOTAL				200 MARKS (A)
		OBSTETRICS		40 MARKS (B1)
VIVA VOCE				
		GYNAECOLOGY		40 MARKS (B2)
LOG BOOK				20 MARKS (C)
AGGREGATE (CLINICAL + VIVA)				300 MARKS (A+B1+B2+C)
MINIMUM PASS (50%)				150 MARKS
DISSERTATION				APPROVED/ NOT APPROVED

MS OBSTETRICS & GYNAECOLOGY

VIVA VOCE- DETAILED SCHEME

OBSTETRICS	10 MIN / CANDIDATE		30 MARKS
1. DUMMY PELVIS 2. INSTRUMENTS 3. DRUGS 4. SPECIMENS 5. CTG/PARTOGRAM 6. USG			
GYNAECOLOGY	10 MIN / CANDIDATE		30 MARKS
1. INSTRUMENTS 2. SPECIMENS 3. USG 4.DRUGS 5. FAMILY WELFARE 6. ENDOSCOPY			

OSCE- DETAILED SCHEME

MANNED, COUNSELLING, CONSULTING ,BREAKING NEWS,	
COMMUNICATION SKILLS	BEREAVEMENT
CLINICAL EXAMINATION	MANNED
	MANNEQUN, PAP,AMSTL,CATHETERISATION
OUT PATIENT PROCEDURES	CTG, USG, Endometrial Sampling
IN-PATIENT PROCEDURES	EPISIOTOMY, UTERINE INVERSION CORRECTION, MRP LAPAROSCOPY, HYSTEROSCOPY,VULVAL LESION
SPOTTERS ON LAPTOP	SLIDES, VAGINAL LESIONS, STD, ENDOCRINES, ENDOMETRIOSIS
	ECTOPIC PREGNANCY, URO GYN, SURGICAL PROCEDURES, ONCOLOGY
PARTOGRAM	

12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

13. VIVA : VIVA including Competency Assessment

VIVA including Competency Assessment - 80 Marks (60 + 20)

14. OSCE / OSPE:

1. OSCE (Objective Structural Clinical Examination)

<u>Based on Objective Structured Exam Stations:</u>	
S.No	Stations
1.	Early Diagnosis of Pregnancy
2.	Abnormal Pregnancy
3.	Labour related Partogram
4.	Contraception
5.	Instruments
6.	Common Drugs
7.	Specimen
8.	Histopathology slides
9.	Radio Diagnosis (USG,CT,DOPPLER,X-ray)
10.	Latest Management –Obstetrics

15. REFERENCE BOOKS

- MUDALIAR & MENON'S book of Obstetrics.
- Manual of Obstetrics – Shirish Daftary & Sudip Chakravarti – 3rd Edition.
- Ian Donald - Practice of Obstetrics.
- Human Labor and birth – Oxorn-Foote 6th edition
- William's Text book of Obstetrics
- Obstetrics Normal & Problem Pregnancies – 7th edition – Gabbe.
- Jeffcoate's principles of gynaecology – 8TH EDITION
- Clinical Gynaecologic Oncology Disaia JP, Creasman TM 8TH edition
- MICHAEL DE SWIET Medical Disorders in Pregnancy
- ARIAS High Risk Pregnancy
- JAMES High Risk Pregnancy
- Berek & Novak's Gynaecology – 15th Edition.
- Shaw's Text Book of Gynaecology – 15th Edition
- Shaw's Text Book of Operative Gynaecology – 7th Edition
- Te Linde's Operative Gynaecology 10th Edition
- Clinical Gynaecologic Oncology: Disaia JP, Creasman TM, 9th Edition, The C.V. Mosby Company 1989
- Clinical Gynaecologic Endocrinology and Infertility – 8th Edition Speroff & Fritz, Lippincott 2005

**** Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

16. JOURNALS

1. Journal of Obstetrics & Gyn, India
2. British Journal of Obstetrics & Gynaecology
3. American Journal of Obstetrics & Gynaecology
4. International Journal of Obstetrics & Gynaecology
5. Obstetric & Gynae Survey
6. Gynae Oncology
7. Obstetrics & Gynae Clinics of N.America
8. Clinical Obstet & Gyn
9. Recent Advances in O&G
10. STUDD – Progress in O&G

Log Book:

DEPARTMENT OF OBSTETRICS & GYNAECOLOGY

This is to certify that this log book is a bonafide record of

All the Procedures done and the Academic activities

Participated in by

.....

.....

During his / her training in

Obstetrics and Gynaecology

From to

.....

At the

In accordance with the requirement of the

Tamil Nadu Dr.M.G.R. Medical University for the

Degree M.D. Branch II (Obstetrics and Gynaecology)

Professor & Head

Department of Obstetrics and Gynaecology

Name:

INSTRUCTIONS

This logbook is intended to be a record of all operations performed or participated by a student during his/her course.

The students should enter in the following pages the information required in each operation including the date, patient's hospital number and name, the nature of the operation and the level of their participation.

- P - Principal Operator
- PA - Principal Operator assisted by a senior
- A - Assistant
- T - Teaching (Junior)
- W - Witnessed

The students should obtain the signature of the consultant in each page.

The students should provide a summary of the work they have done by giving the total number of each type of operation carried out during your entire training period on the consolidation sheet. Each operation should be entered under only one heading. Case reports or articles published or presented in conferences, symposia or departmental clinical meetings should be recorded in the sheet provided for the purpose.

Department of Obstetrics and Gynaecology,

.....

.....

Name:

1	Postings	Date Commenced	Date Completed
2			
3			
4			
5			
6			
7			
8			
9			
10			

Date	Hospital Number	Patient's Name	Diagnosis	Nature of Operation	P / PA / A / T / W	Remarks (Complication)

Date of this Log Book – Commenced :

Completed :

Signature of Consultant :

.....


 DEAN
 TAGORE MEDICAL COLLEGE & HOSPITAL
 RATHINAMANGALAM, MELAKOTTAIYUR POST,
 CHENNAI-600 127.

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/17

Date: 29-08-2022

**GUIDELINES FOR COMPETENCY
BASED
POSTGRADUATE TRAINING
PROGRAMME FOR MS IN
ORTHOPEDICS**


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN ORTHOPAEDICS

Preamble

Competency based training programme in Orthopaedics aims to create postgraduate student who, after undergoing the requisite training, should be able to serve the needs of the community and should be competent to solve the problems pertaining to the speciality of Orthopaedics and Trauma.

A postgraduate undergoing training MS in Orthopaedics should be trained to identify and recognize various congenital, developmental, inflammatory, infective, traumatic, metabolic, neuromuscular, degenerative and oncologic disorders of the musculoskeletal system. She/he should be able to provide competent professional services to trauma and orthopaedic patients at a primary/ secondary/tertiary healthcare centres. The PG should acquire knowledge, skill and attitude to provide healthcare and education to the patients and students.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by subject-content specialists. The Expert Group of the NMC had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies.

In order to achieve sustainable outcomes, certain competencies are essential to be achieved and assessed that will enable the qualified professional to perform the role in practice as an orthopaedic specialist. These roles would be to perform as a:

1. Clinical Expert
2. Professional
3. Scholar
4. Team Member

SUBJECT SPECIFIC OBJECTIVES

The goal of M.S. Orthopaedics is to produce a competent doctor who:

1. Is aware of contemporary advances & developments in medical sciences as related to Orthopaedics and Trauma.
2. Has acquired the competencies pertaining to the subject that are required to be practiced in the community and at all levels of health system.
3. Recognizes the health needs of the patient and family and carries out professional obligations in keeping with principles of the National Health Policy and professional ethics.
4. Is oriented to principles of research methodology.
5. Has acquired skills in educating medical and paramedical professionals.
6. Has acquired skills in effectively communicating with the person, family and the community.

There is need of competency based learning. Core competencies are the essential knowledge, values and skills vital to the successful performance of effective practice of Orthopaedic and Trauma care on patients. Competence-based training is distinctly different from traditional teaching process. Competence-based training focuses on learning by doing.

Competence in medicine has been defined as “the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals and communities being served”. Competence is not an achievement but rather a habit of lifelong learning.

Ideally, the assessment of competence (what the student or physician is able to do) should provide insight into actual performance (what he or she does habitually when not observed), as well as the capacity to adapt to change, find and generate new knowledge, and improve overall performance. The specific learning objectives based on core competence are common to all specialities. As an example of designing learning objectives in the seven domains of core competence are described below:

1. Professionalism
2. Patient care
3. Medical Knowledge
4. Practice-based learning and improvement
5. Interpersonal and Communication skills
6. Systems-based practice
7. Academic skills

The **Goal** of the MS Orthopedics course is to train a doctor to become a competent teacher, surgeon and researcher in who has acquired competence / skills as given below:

1. Professionalism

- 1.1 Accepts personal responsibility for care of one's patients, consistent with good work ethics and empathy.
- 1.2 Demonstrates appropriate truthfulness and honesty with colleagues.
- 1.3 Recognizes personal beliefs, prejudices, and limitations. His / her personal beliefs and prejudices should not come in the way of providing service.
- 1.5 Respects patient confidentiality at all times in verbal and written communication with others.

2. Patient Care

- 2.1 History of and physical examination
 - 2.1.1 Demonstrates ability to obtain a comprehensive and focused history of illness from patient/relatives.
 - 2.1.2 Demonstrates ability to perform a comprehensive and problem-focused physical examination of the concerned human organ.
- 2.2 Information Management
 - 2.2.1 Demonstrates mastery of the traditional organization of medical data in oral and written presentations.
 - 2.2.2 Demonstrates use and interpretation of diagnostic procedures and data.
 - 2.2.3 Demonstrate ability to use information to produce evidence for the diagnosis and treatment of relevant disease condition/s.
- 2.3 Procedural
 - 2.3.1 Demonstrates mastery of adequate medical record keeping.
 - 2.3.2 Demonstrates knowledge of accessing data and information systems.
 - 2.3.3 Demonstrates the ability to perform a specific set of procedures identified by the faculty.

3. Medical Knowledge

- 3.1 Core Discipline
 - 3.1.1 Competencies unique to the discipline,
 - 3.1.2 Competencies derived from the clinical, pre-clinical and para-clinical disciplines.
- 3.2 Problem Solving
 - 3.2.1 Demonstrates the ability to identify and find information relevant to a clinical problem, using consultation, texts, and the archival literature and electronic media.

- 3.2.2 Demonstrates the ability to generate an initial list of differential diagnoses given a specific chief complaint and patient characteristics.
- 3.2.3 Demonstrates the ability to re-rank the differential diagnoses based on information gathered from the history, physical, and auxiliary studies (investigations).
- 3.2.4 Demonstrates the ability to explain a mechanism for each aspect of a patient's problem, including biological, behavioural, and social aspects.
- 3.2.5 Demonstrates the ability to evaluate scientific / clinical information and critically analyze conflicting data and hypotheses.
- 3.2.6 Demonstrates an ability to counsel a patient providing an option of treatment, conservative or operative.

4. Practice-Based Learning and Improvement

- 4.1 Physician Scholar
 - 4.1.1 Demonstrates the ability to analyze the quality and implications of medical literature and apply new knowledge in the delivery of health care.
 - 4.1.2 Demonstrates an interest and ability to identify future areas of inquiry in medical research.
 - 4.1.3 Demonstrates enthusiasm and positive attitude in the educational process and participates fully in educational activities.

5. Interpersonal and Communication Skills

- 5.1 Human Relationships
 - 5.1.1 Demonstrates knowledge of or appropriate inquiry about family and support systems.
 - 5.1.2 Demonstrates an effective system for identifying and addressing ethical, cultural, and spiritual issues associated with health care delivery.
 - 5.1.3 Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.
 - 5.1.4 Accurately assesses a patient's exportations and assumptions in accessing the health care system.
 - 5.1.5 Effectively engages the patient and / or family in verbal communications and counselling.

6. System – Based Practice

- 6.1 Health Care Management
 - 6.1.1 Demonstrates a practical, efficient and cost effective approach to diagnosis and treatment planning and recognizes its social and economic impact.

- 6.1.2 Demonstrates the ability to engage the patient family in diagnosis and therapeutic treatment planning.
- 6.1.3 Demonstrates the ability to recognize and outline initial treatment for patient with life threatening emergencies regardless of aetiology.
- 6.1.4 Demonstrates knowledge of alternative medicine options and understands their role in health care delivery (AYUSH).

6.2 Health Service Delivery

- 6.2.1 Demonstrates knowledge of health care financing and applies it in assisting patient to access the best possible care.
- 6.2.2 Utilizes knowledge of population-based and evidence-based medicine in making patient management decisions.
- 6.2.3 Utilizes knowledge of managed care systems in making patient treatment plans and health care maintenance plans.

6.3 Health Care Team approach to health care delivery.

- 6.3.1 Demonstrates an understanding of the roles and competencies of other health care providers.
- 6.3.2 Demonstrates the ability to engage other health care professionals.
- 6.3.3 Demonstrates the ability to follow and lead in a team approach to health care delivery.

7. Academic Skills (Scholarly activity)

- 7.1 Familiarity with basic research methodology, epidemiology, basic information technology skills.
- 7.2 Planning the protocol of a thesis, its execution and final report.
- 7.3 Skills to review of relevant literature and asking relevant research question with hypothesis development.
- 7.4 Conducting clinical sessions for undergraduate medical students, nurses and paramedical workers.

SUBJECT SPECIFIC COMPETENCIES

1. Predominant in cognitive domain:

- 1.1. Describe the principles of injury and its mechanism and mode, its clinical presentation, plan appropriate investigations and interpret the results, and institute the management of musculoskeletally injured patient, different forces resulting in fractures, biomechanical principles of fracture fixation.
- 1.2. Identify and describe the surface anatomy and relationship within of the various bones, joints, ligaments, major arteries, veins and nerves of the musculoskeletal system of the spine, upper limb, lower limb and the pelvis, chest, abdomen and head & neck. Identify structural peculiarities of specific bony components and structural speciality of clinical importance during fixation.
- 1.3. Define and describe the pathophysiology of shock (circulatory failure), types of shock and principles of management.
- 1.4. Define and describe, types of respiratory failure, the pathophysiology of respiratory failure and management.
- 1.5. Describe the principles and stages of bone and soft tissue healing, types of bone healing and different intrinsic and extrinsic factors which influence fracture healing.
- 1.6. Understand and describe the metabolic, nutritional, endocrine, and social impact of trauma, critical illness and biomechanical principles involved in each.
- 1.7. Enumerate, classify and describe the various bony/soft tissue injuries affecting the axial and appendicular skeletal system in adults and children.
- 1.8. Describe the principles of internal and external fixation for stabilization of bone and joint injuries.
- 1.9. Describe the mechanism of homeostasis, fibrinolysis and methods to control haemorrhage and rationale for each management.
- 1.10. Describe the physiological coagulation cascade and its abnormalities.
- 1.11. Describe different techniques of pain management as well as recovery of function in specific disease and trauma scenario.
- 1.12. Describe the pharmacokinetics and pharmacodynamics of drug metabolism and excretion of analgesics, anti-inflammatory agents, antibiotics, disease - modifying agents and chemotherapeutic agents and biologicals.
- 1.13. Understand the principles of Early Total Care and Damage Control Orthopaedics and planning of definitive orthopaedic management.

- 1.14. Understand the principles of biostatistics and research methodology.
- 1.15. Understand the principles of Angiography, CT/MR angiography, Doppler Ultrasound, Sinogram.
- 1.16. Acquire the ability to order investigations.
2. Describe the clinical presentation, plan investigations, interpret results and institute steps for the management and prevention of the following disease conditions:
 - 2.1. Nutritional deficiency diseases affecting the bones and joints,
 - 2.2. Depositional arthropathies,
 - 2.3. Endocrine abnormalities of the musculoskeletal system,
 - 2.4. Metabolic abnormalities of the musculoskeletal system,
 - 2.5. Congenital anomalies of the musculoskeletal system,
 - 2.6. Developmental skeletal disorder of the musculoskeletal system,
 - 2.7. Bone and soft tissue tumours affecting the musculoskeletal system.
3. Describe the pathogenesis and clinical features of the following conditions in adults and children, plan appropriate investigations, interpret the results and institute appropriate management of:
 - 3.1. Tubercular infections of bone and joints (musculoskeletal system),
 - 3.2. Pyogenic infections of musculoskeletal system,
 - 3.3. Mycotic infections of musculoskeletal system,
 - 3.4. Autoimmune disorders of the musculoskeletal system (HIV),
 - 3.5. Rheumatoid arthropathy, Ankylosing spondylitis, seronegative arthropathy.
 - 3.5.1. Osteoarthritis and spondylosis
4. Describe the pathogenesis and clinical presentation, plan and interpret results of investigations and institute appropriate treatment in the following conditions:
 - 4.1. Post-polio residual paralysis
 - 4.2. Cerebral palsy
 - 4.3. Muscular dystrophies and myopathies
 - 4.4. Nerve injuries
 - 4.5. Entrapment neuropathies
 - 4.6. Spinal dysraphism
 - 4.7. Spinal anomalies.

5. Diagnose musculoskeletal manifestation of AIDS and HIV infection and its management.
6. Describe the aetiopathogenesis and clinical presentation, plan and interpret results of investigations and institute appropriate treatment for the management of osteonecrosis of bones.
7. Identify situations requiring rehabilitation services, prescribe suitable orthotic and prosthetic appliances and act as a member of the team providing rehabilitation care.
8. Identify and manage emergency situation in disorders of the musculoskeletal system.
9. Understand the basics of diagnostic imaging in orthopaedics like how and when to order and how to interpret the results of:
 - 9.1. Plain x-ray
 - 9.2. Ultrasonography
 - 9.3. Computerised axial tomography
 - 9.4. Magnetic resonance imaging
 - 9.5. PET scan
 - 9.6. Radio Isotope bone scan
 - 9.7. Digital Subtraction Angiography (DSA)
 - 9.8. Dual energy x-ray Absorptiometry
 - 9.9. Arthrography.
10. Describe the aetiopathogenesis, clinical presentation, identification, plan investigation/s and institute appropriate treatment for oncologic problems of musculoskeletal system (both benign and malignant: primary and secondary).
11. Understand the basics and principles of biomaterials and orthopaedic metallurgy.
12. Describe the principles of normal and abnormal gait and understand the biomedical principles of posture and replacement surgeries.
13. Describe social, economic, environmental, biological and emotional determinants of health in a given patient with a musculoskeletal problem.
14. Identify a research problem, prepare a research protocol, conduct a study, record observations, analyse data, interpret the results, discuss and disseminate the findings

II. Predominant in the Psychomotor domain

1. **At the end of the first year of M.S. Orthopaedics programme, the student should be able to:**

- 1.1. Elicit a clinical history from a patient, do a physical examination, document in a case record, order appropriate investigations and make a clinical diagnosis. (Records of all competencies achieved should be documented in log book/E-Portfolio)
- 1.2. Impart wound care, where applicable, including different types of wound, and different chemotherapeutic agents for wound care, including VAC application and its care, and local antibiotic delivery system.
- 1.3. Apply all types of POP casts/slabs, splints and tractions as per need. Learn different types of bandaging.
- 1.4. Identify shock and provide resuscitation.
- 1.5. Perform aspiration of joints and local infiltration of appropriate drugs.
- 1.6. Perform appropriate wound debridement.
- 1.7. Perform arthrotomy of knee joint and also assist in arthrotomy of hip, ankle and shoulder.
- 1.8. Perform incision and drainage of abscess.
- 1.9. Perform split thickness skin grafting.
- 1.10. Perform fasciotomies.
- 1.11. Apply external fixators.
- 1.12. Apply skeletal tractions including skull tongs.
- 1.13. Triage a disaster situation and multiple trauma patients in an emergency room.
- 1.14. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating.
- 1.15. Perform closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture.
- 1.16. Perform on a cadaver standard surgical approaches to the musculo-skeletal system.

2. At the end of the second year of M.S. Orthopaedics course, the student should be able to:

- 2.1. Take an informed consent for standard orthopaedic procedures.
- 2.2. Perform closed/open biopsies for lesions of bone, joints and soft tissues.
- 2.3. Perform split thickness skin grafting and local flaps.
- 2.4. Perform on bone models, internal fixation with k-wires, screws, plates, Dynamic hip/condylar screws/nailing.
- 2.5. Perform sequestrectomy and saucerisation.
- 2.6. Perform arthrotomy of joints like hip/shoulder, ankle, elbow.
- 2.7. Perform repair of open hand injuries including tendon repair.

- 2.8. Perform arthodesis of small joints.
- 2.9. Perform diagnostic arthroscopy on models and their patients.
- 2.10. Perform carpal tunnel/tarsal tunnel release.
- 2.11. Apply Ilizarov external fixator.
- 2.12. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities.
- 2.13. Perform amputations at different levels.
- 2.14. Perform corrective surgeries for Congenital talipes equino-varus (CTEV), DDH, Perthes/ skeletal dysplasia.
- 2.15. Perform cadaver based procedures, arthroscopy, arthrotomy.

3. At the end of the third year of M.S. Orthopaedics programme, the student should be able to:

- 3.1. Assist in the surgical management of poly trauma patient.
- 3.2. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle.
- 3.3. Assist in spinal decompressions and spinal stabilizations.
- 3.4. Assist in operative arthroscopy of various joints.
- 3.5. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow.
- 3.6. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes.
- 3.7. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement.
- 3.8. Assist in open reduction and internal fixations of complex fractures of acetabulum, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand.
- 3.9. Assist in spinal deformity corrections.
- 3.10. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra- medullary nailing, LRS.
- 3.11. Assist in limb lengthening procedures.
- 3.12. Assist in revision surgeries.
- 3.13. Provide pre- and post- OP care. This care should be exercised from first year.
- 3.14. Perform all clinical skills as related to the speciality.

III. Predominant in Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

- 1.1. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- 1.2. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

IV. Attitudes including Communication skills and Professionalism

1. Communication skills: The PG student should:

- 1.1. Exhibit participation in honest, accurate health related information sharing in a sensitive and suitable manner.
 - 1.2. Recognize that being a good communicator is essential to practice effectively.
 - 1.3. Exhibit effective and sensitive listening skills.
 - 1.4. Recognise the importance and timing of breaking bad news and know how to communicate.
 - 1.5. Exhibit participation in discussion of emotional issues.
 - 1.6. Exhibit leadership in handling complex and advanced communication.
 - 1.7. Recognize the importance of patient confidentiality and the conflict between confidentiality and disclosure.
 - 1.8. Be able to establish rapport in therapeutic bonding with patients, relatives and other stakeholders through appropriate communication.
 - 1.9. Able to obtain comprehensive and relevant history from patients/relatives.
 - 1.10. Able to counsel patients on their condition and needs. Add counselling of diagnosis, prognosis, complications as well as planning for the management.
2. **Team work:** Seek cooperation. Coordination and communication among treating specialties and paramedical staff.
 3. **Counselling of relatives:** regarding patient's condition, seriousness, bereavement and counselling for organ donation in case of brain stem death.
 4. **Leadership:** Trauma prevention, education of the public, paramedical and medical persons.
 5. **Advocacy:** with the government and other agencies towards cause of trauma care.
 6. **Ethics:** The Code of Medical Ethics as proposed by National Medical Commission of India will be learnt and observed.

SUBJECT SPECIFIC PRACTICE-BASED OR PRACTICAL COMPETENCIES

Name/ Description of practice based competencies	Expected quantum
1. Taking a Clinical History from a patient with appropriate physical exam - Hip-pain, Limp, Deformity, Instability, Both in child and adult - Knee-pain, Deformity, Instability in child and adult - Ankle, Foot - Shoulder - Elbow - Wrist - Head - Spine	At least 3 clinical encounters in each region
2. In the Bone Skills Lab <u>Basic</u> - Introduction and tension band wiring - Lag screw interfragmentary compression - Broad plating - Narrow plating - Ex-Fix - Cancellous screw fixation - Umex <u>Intermediary</u> - DHS - DCS - Tibia nailing - Femur nailing - Tibia condyle - Elbow - Ankle <u>Advanced:</u> - Pelvis - Pubic symphysis - Acetabulum - MIPPO - Hemiarthroplasty - Spine posterior - Spine anterior	Practice at least twice on bone models and record

3. On Patients i. At the end of the first year of M.S. Orthopaedics programme, the student will be able to perform: a. Wound care - different types of wound, and different chemotherapeutic agents for wound care, including VAC application b. POP casts/slabs, splints and tractions as per need. Learning of different types of bandaging. c. Identify shock and provide resuscitation d. Aspiration of joints and infiltration of appropriate drugs e. wound debridement f. Arthrotomy of knee joint and assist in arthrotomy of Hip, ankle, shoulder. g. Incision and drainage of abscess h. Split thickness skin grafting i. Fasciotomes j. External fixators k. Skeletal tractions including skull tongs l. Triage a disaster situation and multiple trauma patients in an emergency room m. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating n. Closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture. o. Perform on a cadaver standard surgical approaches to the musculo skeletal system. ii. At the end of the second year of M.S. Orthopaedics course, the student should be able to: a. Perform closed/open biopsies for lesions of bone, joints and soft tissues b. Perform split thickness skin grafting and local flaps	As per the clinical volume available in each institution

c. Perform on bone models, internal fixation with k-wires, screws, plates. Dynamic hip/condylar screws/nailing. d. Perform sequestrectomy and saucerisation e. Perform arthrotomy of joints like hip/shoulder, ankle, elbow f. Perform repair of open hand injuries including tendon repair g. Perform arthodesis of small joints h. Perform diagnostic arthroscopy on models and their patients i. Perform carpal tunnel/tarsal tunnel release j. Apply ilizarov external fixator k. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities l. Perform amputations at different levels m. Perform corrective surgeries for CTEV, DDH, perthes/ skeletal dysplasia n. Perform cadaver based procedures, Arthroscopy, Arthrotomy.	As per the clinical volume available in each institution
iii. At the end of the third year of M.S. Orthopaedics programme, the student should be able to: a. Assist in the surgical management of poly trauma patient b. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle c. Assist in spinal decompressions and spinal stabilizations d. Assist in operative arthroscopy of various joints e. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow f. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes g. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement. h. Assist in open reduction and internal fixations of complex fractures of acetabulum, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand i. Assist in spinal deformity corrections	As per the clinical volume available in each institution

j. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra medullary nailing, LRS k. Assist in limb lengthening procedures l. Assist in Revision surgeries m. Provide pre and post OP care This care should be exercised from first year n. Perform all clinical skills as related to the speciality.	

SYLLABUS

I. COGNITIVE DOMAIN

At the end of the M.S. Orthopaedics programme, the post graduate student should be competent and show sufficient understanding of Basic Sciences as applicable to Orthopaedics and Trauma through a problem based approach.

1. Basic Sciences as related to Orthopaedics and Trauma

- a) Embryogenesis of all organ systems
- b) Structure and function of Central Nervous System
- c) Structure and function of the peripheral Nervous System
- d) Structure and function of the arterial and venous system
- e) Structure and functions of the head & neck, abdomen, thorax and extremities.

2. Physiological basis and Pathophysiology in Health and Disease

- a) Physical Growth
- b) Temperature regulation
- c) Acid Base Balance
- d) Fluid Balance
- e) Hematopoiesis
- f) Hemostasis
- g) Electrolyte balance
- h) Bone mineralization: Calcium-Phosphate balance
- i) Renal functions

- j) Hepatic function
 - k) Respiratory functions
 - l) Cardiac functions
 - m) Gastrointestinal functions
 - n) Endocrine functions
 - o) Developmental Milestones
 - p) Nutritional Needs of Orthopaedic/Trauma Patients
 - q) Allergy
3. **Clinical Microbiology as related to Orthopaedic infections**
- a) Virology
 - b) Bacteriology
 - c) Mycology
 - d) Parasitology (Protozoology and Helminthology)
 - e) Waste disposal, Sterilization, Disinfection
4. **Clinical Pharmacology as related to Orthopaedics & Trauma**
- a) Pharmacokinetics – of common medications used in Orthopaedics & Trauma
 - b) Antimicrobials
 - c) Analgesia, Sedation
 - d) Drug Interactions
 - e) Adverse effects
 - f) Antidotes for Poisons
 - g) Drug induced disease
5. **Professionalism and Ethics**
- a) Professionalism
 - b) Ethics
 - c) Medico legal essentials

6. Wound healing principles

- a) Types of wounds
- b) Stages of wound healing
- c) Biochemical & Molecular factors in wound healing
- d) Chemotherapeutic and other Pharmaceuticals in wound care
- e) Host, Environment and agent factors

7. Bone Healing

- a) Principles of bone healing
- b) Biological bone healing
- c) Factors influencing bone healing
- d) Biomechanism of bone healing

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods**

can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected would be as per subject requirements. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. **Salient features of Undergraduate/Postgraduate medical curriculum**
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B 1. Journal club: Minimum of twice a month is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

B 2. ORTHO RADIOLOGY MEETS: Twice a month discussions amongst Ortho. & Radiology Residents under facilitation of faculty on various imaging modalities used and its interpretation.

B.3. ORTHO SURGICAL PATHOLOGICAL MEET: Special emphasis on the surgical pathology radiological aspect of the case in the pathology department. Clinician (Ortho resident) presents the clinical details of the case, radiology PG student describes the Radiological findings and its interpretation and Pathology student describes the morbid anatomy and histopathology of the same case.

B. 4. SKILLS LAB SESSIONS: Once a fortnight for first 2 years.

C. Student Seminar: Minimum of twice a month is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics/case presentation: Case presentation once a week in the ward, outpatient department/special clinics.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases; eg., combined clinical round with Radiology, Pathology etc.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

1. Clinical postings

A major portion of posting should be in Orthopaedics department. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

Rotation of posting

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

- Medical Education Unit (MEU) or Department of Medical Education (DOME) (optional)

T/L Education

- Bone Skills Lab sessions – Twice a week
- Surgical Audit sessions – Once every week
- Cadaver based education – Twice a month
- Web based e-learning sessions – Once a fortnight
- Simulated environment learning – Two sessions in a week
- **Mortality & Morbidity meetings with SURGICAL AUDIT:** Once a month

G b. Posting under “District Residency Programme” (DRP):

All postgraduate students pursuing MS/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

- a) help maintain a record of the work done during training,
- b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
- c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. Course in Research Methodology: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MS training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Mini Cex encounter – at least 4
7. Clinical encounter cards - at least -4
8. Direct observation of procedural skills – at least 6 including Cadaver dissection
9. **OSCE**/Theory, Essay, Short notes
10. MCQS
11. Bone Skill Lab performance assessment

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

The student to be assessed periodically as per categories listed in the student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal. **(It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The postgraduate examination shall be in three parts:

1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory examination

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

There shall be four theory papers (as per PG Regulations).

Paper I: Basic sciences as applied to the subject

Paper II: Traumatology and Rehabilitation

Paper III: Orthopaedic diseases

Paper IV: Recent advances in Orthopaedic surgery & General Surgery as applied to Orthopaedics

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

It should include:

- Stations for clinical, procedural and communication skills
- Log Book Records and reports of day-to-day observation during the training
- Should test the post graduate student's overall knowledge of the subject in:
 - Ortho Radiology
 - Ortho Pathology
 - Histopathology & Gross anatomy
 - Instruments
 - Orthotics and Prosthetics

Recommended Reading:

1. Campbell's Operative Orthopaedics, Vols 1, 2, 3 & 4 Campbell's Operative Orthopaedics, 4-Volume Set, 14th Edition by Frederick M Azar, MD, S. Terry Canale, MD and James H. Beaty, MD
2. Mercer's Orthopaedic Surgery Vol. 1 & 2, Author(s) : Robert B Duthie Edition: Ninth, Year of Publication: 2003
3. Rockwood And Greens – Fractures in Adults, Vol 1& 2 Rockwood and Green's Fractures in Adults Author(s): Paul Tornetta , William Ricci MD, FAAOS, Charles M. Court-Brown MD, FRCS Ed (Orth), Margaret M. McQueen MD, Michael McKee MD, FRCS (C) Publication Date: March 27, 2019
4. Fractures in Children – Rockwood & Wilkins - Rockwood and Wilkins Fractures in Children Edition: 9. Author(s): Peter M Waters MD, David L. Skaggs MD, John M. Flynn. Publication Date: March 19, 2019

5. Paediatric Orthopaedics – Tachidjian, Vol 4 Tachdjian's Pediatric Orthopaedics: From the Texas Scottish Rite Hospital for Children, 6th edition - November 27, 2020 Author: John Herring
6. Concise System Of Orthopaedics And Fractures – Graham Apley Apley's Concise System of Orthopaedics and Fractures Louis Solomon, David Warwick, Selvadurai Nayagam CRC Press, 31-Mar-2005
7. Textbook of Orthopaedics and Trauma – Kulkarni, Vol 1 Textbook of Orthopedics and Trauma (4 Volumes) GS Kulkarni, Sushrut Babhulkar, Publish Year 2016
8. B.D. Chaurasia's Human Anatomy, Vol1, Vol 2, Vol 3 B D Chaurasia's Handbook of Anatomy English Editions 2022 Eighth Editions Volume 2 (paperpack, CHAURASIAS), Author: CHAURASIAS, Publisher: CBS Publishers, Publishing Date 2022
9. Pharmacology and Pharmacotherapeutics – Satoskar- Pharmacology and Pharmacotherapeutics, 24th Edition - June 30, 2015, Authors: RS Satoskar, Nirmala Rege, SD Bhandarkar
10. Orthopaedics Anatomy and Surgical Approaches Frederick Wreckling Orthopaedic Anatomy and Surgical Approaches Edited by Frederick W. Reckling, Jo Anne B. Reckling and Melvyn P. Mohn, S. P. Frostick, First Published August 1, 1991
11. Green's Operative Hand Surgery-Vol. 1& 2, Green, David P; Hotchkiss, Robert N Green's Operative Hand Surgery, 2-Volume Set 7th Edition - February 24, 2016, Authors: Scott W. Wolfe, William C. Pederson, Scott H. Kozin, Mark S. Cohen
12. Surgical Exposures in Orthopedics: The Anatomic Approach, Hoppenfeld, Stanley; De Boer, Piet Surgical Exposures in Orthopaedics: The Anatomic Approach, Edition: 6, Author(s): Piet de Boer MD, Richard Buckley MD, FRCSC, Stanley Hoppenfeld MD, Publication Date: October 7, 2021
13. Text Book of Ilizarov Surgical Techniques Bone Correction And Lengthening, Golyakhovsky, Vladimir; Frankel, Victor H Textbook of Ilizarov Surgical Techniques: Bone Correction and Lengthening by Vladimir Golyakhovsky, Victor H Frankel, Publishing Year 2010
14. Applied Orthopaedic Biomechanics, Dutta, Santosh; Datta, Debasis Applied Orthopaedic Biomechanics, by Debasis Datta Santosh K Dutta Publisher : B.I.Publications, Year 2008.

Journals

03-05 international Journals and 02 national (all indexed) journals.

National Medical Commission

Student appraisal form for MS in Orthopedics											
	Element	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	Scholastic Aptitude and Learning										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc.)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg. Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	Care of the patient										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										

2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to health care quality improvement										
3	Professional attributes										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
4	Space for additional comments										
5	Disposition										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										

Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MS in Orthopaedics

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OPHTHALMOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of this programme is to standardize Ophthalmology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in post graduate and undergraduate teaching as well as result in creating competent ophthalmic surgeons with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Programme Objectives

The clinical post graduate training programmes are intended at developing in a student a blend of qualities that of a clinical specialist, a teacher and a researcher. These programmes are organized such that a post graduate student should possess the following qualities, knowledge and skills:

- a. The student should possess basic knowledge of the structure, function and development of the human body as related to ophthalmology, of the factors which may disturb these mechanisms and the disorders of structure and function which may result thereafter.
- b. The student should be able to practice and handle most day-to-day problems independently in ophthalmology. The student should recognize the limitations of his/her own clinical knowledge and know when to seek further help.
- c. The student should understand the effects of environment on health and be familiar with the epidemiology of at least the more common diseases in the field of ophthalmology.


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- d. The student should be able to integrate the preventive methods with the curative and rehabilitative measures in the comprehensive management of the disease.
- e. The student should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively.
- f. The student should also be made aware of Mobile Ophthalmic Unit and its working and components.
- g. The student should be familiar with the current developments in Ophthalmic Sciences.
- h. The student should be able to plan educational programmes in Ophthalmology in association with senior colleagues and be familiar with the modern methods of teaching and evaluation.
- i. The student should be able to identify a problem for research, plan a rational approach to its solution, execute it and critically evaluate his/her data in the light of existing knowledge.
- j. The student should reach the conclusions by logical deduction and should be able to assess evidence both as to its reliability and its relevance.
- k. The student should have basic knowledge of medico-legal aspects of medicine.
- l. The student should be familiar with patient counseling and proper consent taking.

SUBJECT SPECIFIC COMPETENCIES

A post graduate student upon successfully qualifying in the M.S. (Ophthalmology) examination should be able to:

- a) Offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common situations encountered at the level of health services.
- b) Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his/her practice.
- c) Be aware of her/his own limitations to the application of the specialty in situations, which warrant referral to more qualified centers or individuals.
- d) Apply research and epidemiological methods during his/her practice. The post graduate student should be able to present or publish work done by him/her.
- e) Contribute as an individual/group towards the fulfillment of national objectives with regard to prevention of blindness.
- f) Effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.

At the end of the course, the student should have acquired knowledge in the following:

A. Cognitive domain

Basic Medical Sciences:

- Attain understanding of the structure and function of the eye and its parts in health and disease.
- Attain understanding and application of knowledge of the structure and function of the parts of Central Nervous System and other parts of the body with influence or control on the structure and function of the eye.
- Attain understanding of and develop competence in executing common general laboratory procedures employed in diagnosis and research in Ophthalmology.

1. Clinical Ophthalmology:

Given adequate opportunity to work on the basis of graded responsibilities in outpatients, inpatient and operation theatres on a rational basis in the clinical sections from the day of entry to the completion of the training programme, the students should be able to:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases presented.
- Acquire understanding of and develop inquisitiveness to investigate to establish cause and effect of the disease.
- To manage and treat all types of ophthalmic cases.
- To competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and muscle anomalies.
- To competently handle all ophthalmic medical and surgical emergencies.
- To be familiar with micro-surgery and special surgical techniques.
- To demonstrate the knowledge of the pharmacological (including toxic) aspects of drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.

2. Refraction:

- Acquire competence in assessment of refractive errors and prescription of glasses for all types of refraction problems.
- Acquire basic knowledge of manufacture and fitting of glasses and competence of judging the accuracy and defects of the dispensed glasses.

3. Ophthalmic super-specialties:

Given an opportunity to work on a rotational basis in various special clinics of sub-specialties of ophthalmology, if possible, the student should be able to:

- Examine, diagnose and demonstrate understanding of management of the problems of neuro-ophthalmology and refer appropriate cases to neurology and neuro-surgery.
- Examine, diagnose and demonstrate understanding of management of (medical and surgical) complicated problems in the field of (a) lens, (b) glaucoma, c) cornea, (d) retina, (e) pediatric ophthalmology, (f) oculoplasty, (g) uvea, and (I) genetic problems in ophthalmology.
- To demonstrate understanding of the manufacture, and competence in prescription and dispensing of contact lenses and ocular prosthesis.

5. Ophthalmic pathological/microbiological/biochemical sciences

- Be able to interpret the diagnosis in correlation with the clinical data and routine materials received in such cases.

6. Community Ophthalmology

Eye camps may be conducted where the PG students are posted for imparting training to according to a set methodology. The community and school surveys may also be conducted by the post graduate students.

The post graduate students are given an opportunity to participate in surveys, eye camps. They should be able to guide rehabilitation workers in the organisation and training of the blinds in art of daily living and in the vocational training of the blind leading to gainful employment.

7. Research :

- Recognise a research problem.
- State the objectives in terms of what is expected to be achieved in the end.
- Plan a rational approach with appropriate controls with full awareness of the statistical validity of the size of the material.
- Spell out the methodology and carry out most of the technical procedures required for the study.
- Accurately and objectively record on systematic lines results and observation made.
- Analyze the data with the aid of an appropriate statistical analysis.

- Interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what further remains to be done.
- Write a thesis in accordance with the prescribed instructions.
- Write at least one scientific paper as expected of International Standards from the material of this thesis.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical skills:

Essential diagnostic skills:

I. Examination techniques along with interpretation

1. Slit lamp Examination

- i. Diffuse examination
- ii. Focal examination
- iii. Retroillumination – direct and indirect
- iv. Sclerotic scatter
- v. Specular reflection
- vi. Staining modalities and interpretation

2. Fundus evaluation

- Direct/Indirect ophthalmoscopy
- Fundus drawing
- 3-mirror examination of the fundus
- 78-D/90-D/60-D examination
- Amsler's charting

II. Basic investigations along with their interpretation

1. Tonometry

Tonometry - Applanation/Indentation/Non-contact

2. Gonioscopy

Gonioscopy grading of the anterior chamber angle

3. Tear/ Lacrimal function tests

- i. Staining- fluorescein and Rose Bengal
- ii. Schirmer test/tear film break up time
- iii. Syringing
- iv. Dacrocystography

4. Corneal

- Corneal scraping and cauterization
- Smear preparation and interpretation (Gram's stain /KOH)
- Media inoculation
- Keratometry - performance and interpretation
- Pachymetry
- Corneal topography - if available

5. Colour Vision evaluation

- Ishihara pseudoisochromatic plates
- Farnsworth Munsell, if available

6. Refraction

- i. Retinoscopy- Streak/ Priestley Smith
- ii. Use of Jackson's cross-cylinder
- iii. Subjective and objective refraction
- iv. Prescription of glasses

7. Diagnosis and assessment of Squint

- i. Ocular position and motility examination
- ii. Synoptophore usage
- iii. Lees screen usage
- iv. Diplopia charting
- v. Assessment of strabismus - cover tests/prisms bars
- vi. Amblyopia diagnosis and treatment
- vii. Assessment of convergence, accommodation, stereopsis, suppression

8. Exophthalmometry

Usage of Hertel's exophthalmometer - proptosis measurement

9. Contact lenses

- Fitting and assessment of RGP and soft lenses
- Subjective verification of over refraction
- Complications arising of contact lens use
- Educating the patient regarding CL usage and imparting relevant knowledge of the complications arising thereon

10. Low Vision Aids

- Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- The basics of fitting with knowledge of availability & cost

III. The post graduate must be well versed with the following investigative modalities although the student may or may not perform it individually. But, she/he should be able to interpret results of the following tests:

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests - X rays - Antero posterior/ Lateral view
PNS (Water's view) / Optic canal views
Localisation of intra-ocular and intra-orbital FBs
Interpretations of -USG/ CT/ MRI Scans
6. OCT and UBM
7. ERG, EOG, and VEP

IV. Minor surgical procedures – Must know and perform independently

- Conjunctival and corneal foreign body removal on the slit lamp
- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumours
- Suture removal- skin/conjunctival/corneal/ corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabulbar anaesthesia
- Posterior Sub-Tenon's injections

- Artificial eye fitting

V. Surgical procedures

1. Must know and can perform independently

a. Ocular anaesthesia:

- Retrobulbar anaesthesia
- Peribulbar anaesthesia
- Facial blocks- O'Brein / Atkinson/Van lint and modifications
- Frontal blocks
- Infra orbital blocks
- Blocks for sac surgery

2. Must be able to independently perform and deal with complications arising from the following surgeries :

- Lid Surgery - Tarsorrhaphy
 Ectropion and entropion
 Lid repair following trauma
 Epilation
- Destructive procedures
 Evisceration with or without implant
 Enucleation with or without implant
- Sac surgery
 - i. Dacryocystectomy
 - ii. Dacryocystorhinostomy
 - iii. Probing for congenital obstruction of nasolacrimal duct
- Strabismus surgery
 Recession and resection procedures on the horizontal recti.
- Orbit surgery
 Incision and drainage via anterior orbitotomy for abscess
- Cyclocryotherapy/Cyclophotocoagulation

3. PG Students should be well conversant with use of operating microscope and must be able to perform the surgeries listed below competently under the same:

- Cataract surgery
 - i. Standard ECCE (extracapsular cataract extraction; first year) with or without IOL implantation

- ii. Small incision ECCE with or without IOL implantation and/or Phacoemulsification with PC IOL implantation
- iii. Intracapsular cataract extraction (second year)
- iv. Cataract with Phacoemulsification (third year)
- v. Secondary AC or PC IOL implantation
- Vitrectomy/Scleral buckling
 - Intra-vitreous and intra-cameral (anterior chamber) injection techniques and doses of drugs for the same
 - Needs to know the basis of open sky vitrectomy (anterior segment) as well as management of cataract surgery complications.
 - Assisting vitrectomy and scleral buckling procedures
- Ocular surface procedures
 - Pterygium excision with modifications
 - Conjunctival cyst excision/foreign body removal
 - Corneal foreign body removal
 - Conjunctival flap/ peritomy
- Glaucoma
 - Trabeculectomy
- Corneal
 - Repair of corneo - scleral perforations
 - Corneal suture removal
 - Application of glue and bandage contact lens
- 4. Should have performed/assisted the following microscopic surgeries
 - i. Keratoplasty
 - Therapeutic and optical
 - ii Glaucoma surgery
 - Pharmacological modulation of trabeculectomy
 - Trabeculotomy
 - Goniotomy
 - Glaucoma valve implant surgery
- 5. Desirable to be able to perform following laser procedures
 - Yag Capsulotomy
 - Laser iridotomy
 - Focal and panretinal photocoagulation
- 6. Should have assisted/knowledge of Keratorefractive procedures

Operations:

The PG is provided with an opportunity to perform operations both extra-ocular and intra-ocular with the assistance of the senior post graduate students and/or under the direct supervision of a faculty member. The student is provided with an opportunity

to learn special and complex operations by assisting the senior post graduate student or the faculty in operations of cases of the specialty and be responsible for the post-operative care of these cases.

In **first phase**, the post graduate student is given training in preparations of cases for operation, pre-medication and regional anaesthetic blocks. In the **next phase**, the post graduate student assists the operating surgeon during the operations. In the **third phase**, the post graduate student operates independently assisted by senior post graduate student or a faculty member. She/he is required to be proficient in some operations and show familiarity with others.

Syllabus

Course contents:

These are only broad guidelines and are illustrative, there may be overlap between sections.

I. Basic Sciences:

1. Orbital and ocular anatomy

- i. Gross anatomy
- ii. Histology
- iii. Embryology

2. Ocular Physiology

3. Ocular Pathology

4. Ocular Biochemistry

General biochemistry, biochemistry applicable to ocular function

5. Ocular Microbiology

General Microbiology, specific microbiology applicable to the eye

6. Immunology with particular reference to ocular immunology

7. Genetics in ophthalmology

8. Community Eye Health

II. Optics

- a. Basic physics of optics
- b. Applied ophthalmic optics
- c. Applied optics including optical devices
- d. Disorders of Refraction

III. Clinical Ophthalmology

- i. Disorders of the lids
- ii. Disorders of the lacrimal system
- iii. Disorders of the Conjunctiva
- iv. Disorders of the Sclera

- v. Disorders of the Cornea
- vi. Disorders of the Uveal Tract
- vii. Disorders of the Lens
- viii. Disorders of the Retina
- ix. Disorders of the Optic Nerve and Visual Pathway
- x. Disorders of the Orbit
- xi. Glaucoma
- xii. Neuro-ophthalmology
- xiii. Paediatric ophthalmology
- xiv. Ocular involvement in systemic disease
- xv. Immune ocular disorders
- xvi. Strabismus and Amblyopia
- xvii. Ocular oncology

TEACHING AND LEARNING METHODS

Teaching Methodology:

The theoretical knowledge is imparted to the post graduate student through distinct courses of lecture demonstrations, seminars, symposia and inter- and intra-departmental meetings. The students are exposed to recent advances through discussions in journal clubs and participation in CMEs, and symposia.

The post graduate students are imparted clinical training in several ways:

1. *Group Discussion*

The junior post graduate students may present the symposium to their senior postgraduates where it is fully discussed before finally being discussed in front of the faculty or senior eye specialists. A free and fair discussion is encouraged. These discussions enable the post graduate students to prepare for a general discussion in the class.

2. *Clinical Case discussion*

- a. Bedside discussion on the rounds and outpatient teaching take their toll with patient management. Therefore in addition to these, clinical case discussions should form part of a department's schedule at a fixed time every week. This could range from 1-2 hours and could be held at least once a week. The choice and manner of presentation and discussion varies widely and is left to the discretion of the department. Every effort should be made to include as wide a variety of cases as possible over three years with multiple repetitions. Problem oriented approach is better as it aids in decision making skills.

- b. In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary.
- c. Consultant case presentation is another approach which should be encouraged as it aids in solving complex problems and also is forum for discussion of interesting cases.
- d. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.
- e. Case presentation at other in-hospital multidisciplinary forums.
- f. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- g. Department should encourage e-learning activities.

3. **Seminars**

Seminars should be conducted at least once weekly. The duration should be at least one hour. The topics selected should be repeated once in 3 years so as to cover as wide a range of topics as possible. Seminars could be individual presentations or a continuum (large topic) with many post graduate students participating.

4. **Journal clubs**

Journals are reviewed in particular covering all articles in that subject over a 6 months period and are discussed by the post graduate student under the following headings.

1) Aim	2) Methods	3) Observations
4) Discussions and	5) Conclusions	

The post graduate student to whom the journal is allotted presents the journal summaries to the senior postgraduates. They are expected to show their understanding of the aspects covered in the article and clarify any of the points raised in the article, offer criticisms and evaluate the article in the light of known literature.

- 5. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- 6. **Out-Patients:** For the first six months of the training programme, post graduate students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period

the post graduate student may also be oriented to the common ophthalmic problems. After 6 months, the clinical post graduate student may work independently, where he receives new and old cases including refractions and prescribes for them. The post graduate students are attached to a senior post graduate student and faculty member whom they can consult in case of difficulty.

7. **Wards:** Each post graduate student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the post graduates. The whole concept is to provide the post graduate student increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the post graduate student.

Relevance of beds and admissions in Ophthalmology has really gone down at present, as most of the surgical and special investigative procedures are being performed on out-patient basis. Most of the teaching has to be imparted in out-patients department and special Clinics.

8. **Rotations: Specialty clinics**

The student may rotate in the following subspecialty clinics:

- Anterior segment and cataract
- Glaucoma
- Oculoplastics
- Paediatric ophthalmology and strabismus
- Retina and Uvea
- Cornea, Contact lens and low vision
- Neuroophthalmology
- Refractive Clinic

9. **Practicals in Ocular Histopathology**

The post graduate students may be provided with fully stained slides of the ocular tissues along with relevant clinical data and discuss the diagnosis and differential diagnosis on the basis of the information provided

10. Attend accredited scientific meetings (CME, Symposia, and Conferences).
11. Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to ophthalmology practice are suggested.
13. Maintenance of **log book:** Log books shall be checked and assessed periodically by the faculty members imparting the training.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie, during the training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

FORMATIVE ASSESSMENT, ie., during the training

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

The Post Graduate examination shall be in three parts:

1. Thesis:

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall

be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners. From regulations)

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers.

Paper I: Basic Sciences related to Ophthalmology, Refraction & Optics

Paper II: Clinical Ophthalmology

Paper III: Systemic Diseases in Relation to Ophthalmology

Paper IV: Recent Advances in Ophthalmology and Community Ophthalmology

3. Clinical/Practical and oral/viva voce examination

Clinical

- 1 long case
- 2 short cases with different problems
- 2 fundus Cases
- 1 refraction case

Oral/Viva voce Examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject and shall include:

- i. Instruments
- ii. Pathology specimens
- iii. Drugs, X-rays, USG/OCT/CT/MRI Scans, etc.
- iv. Visual fields and other ophthalmic diagnostic charts

Recommended Reading:

Books (latest edition)

1. Ophthalmic Surgery: Principles and Techniques. Blackwell Science. Albert DM.
2. Principles and Practice of Ophthalmology. Albert DM, Jakobiec. W B Saunders
3. Principles & Practice of Ophthalmology. Gholam A Paymen
4. The Current American Academy of Ophthalmology Basic and Clinical Science Course (13 volumes)
5. Duke Elder's Practice of Refraction. Abrams D. Churchill Livingstone.
6. Text book of Ophthalmology. Yanoff and Duker
7. Retina. Stephen J Ryan:
8. Ophthalmic Ultrasound: Sandra Byrne and Ronald Green.
9. Cornea: Fundamentals, Diagnosis, and Management. Krachmer JH, Mannis MJ, Holland EJ. Mosby Elsevier.
10. Ophthalmology. Yanoff N, Duker JS. Mosby Elsevier.
11. Review of Ophthalmology. Friedman NJ, Kaiser PK, Trattler WB. Elsevier Saunders, Philadelphia.
12. Corneal Transplantation. Vajpayee RB. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
13. Fundamentals of Clinical Ophthalmology Series. Coster D. Cornea. Blackwell Publishing Limited.
14. The Contact Lens Manual. A practical guide to fitting. Gasson A, Morris A J. Butterworth Heinemann Elsevier.
15. Steinert's cataract surgery.
16. Shields Text book of glaucoma
17. Smith and Nozik : Uvea
18. Rootman's diseases of the orbit
19. Eyelid, conjunctival and orbital tumors. An atlas and textbook. Shields JA, Shields CL. Philadelphia: Lippincott Williams & Wilkins.
20. Intraocular tumors. An atlas and textbook. Shields JA, Shields CL.
21. Pediatric Ophthalmology. Taylor and Hoyt: Saunders Ltd.
22. Management of Strabismus and Amblyopia. Pratt-Johnson and Tilson: Thieme Verlag.
23. Handbook of Pediatric Eye and Systemic disease. Wright, Spiegel and Thompson.
24. Binocular Vision and Ocular Motility. Theory and Management of Strabismus. Von Noorden GK. Mosby.
25. Surgical Management of Strabismus. Helveston:
26. Strabismus: A Decision Making Approach. Von Noorden and Helveston:
27. Thyroid Eye Diseases. Char DR. Williams and Wilkins, Baltimore.

28. A Manual of Systematic Eyelid Surgery. Collin JRO (ed). Churchill Livingstone, Edinburgh.
29. Refractive Surgery. Agarwal A, Agarwal A, Jacob Soosan. Jaypee.
30. LASIK Complications, Prevention and management. Gimbel HV, Penno EEA. Slack Inc.
31. Management of Complications of Refractive Surgery. Alio JL, Azar DT. Springer.
32. Quality of Vision: Essential Optics for the Cataract and Refractive Surgeon. Holladay JT. Slack Inc.
33. Ocular Pharmacology: Havener
34. Anatomy: Wolff 's Anatomy of the Eye and Orbit
35. Physiology: Adler's Physiology of the Eye
36. Textbook of Ophthalmology (2 volumes). Easty DL, Sparrow JM. Oxford Oxford Medical Publications.
37. The Eye. Basic Sciences in Practice. Forrester JV, Dick AD, McMenamin PG, Lee WR. W B Saunders.
38. A Stereoscopic Atlas of Macular Diseases: Diagnosis and Treatment. Gass JDM.
39. Neuroophthalmology. Glaser JS. Lipincott Williams & Wilkins. .
40. Clinical Ophthalmic Pathology. Harry J, Misson G. Butterworth/Heinemann.
41. Inherited Retinal Diseases. A Diagnostic Guide. Jimenez Sierra JM, Ogden TE, Van Boemel GB. Mosby.
42. Clinical Ophthalmology. Kanski JJ. Butterworth/Heinemann.
43. ABC of Resuscitation. Colquhoun, M. C., Evans, T. R., Handley, A. J. BMJ Publishing Group.
44. Walsh and Hoyt's Clinical Neuroophthalmology (5 volumes). Miller NR, Newman NJ, Williams and Wilkins.
45. The human eye. Oyster CW Sinauer Associates. Sunderland. Massachusetts
46. Paediatric Ophthalmology. Taylor D. Blackwell Science.
47. Decision Making in Ophthalmology. Van Heuven WAJ, Zwann J. Mosby.
48. Parsons' Diseases of the eye. Sihota and Tandon.
49. Wills Eye Manual
50. International Council of Ophthalmology Residency Curriculum available at <http://www.icoph.org/>

Journals

03-05 international Journals and 02 national (all indexed) journals

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :
Name of the PG Student :
Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications Yes/ No

Remarks* _____

*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

M.D. / M.S.

POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM

2021 - 2022

MD ANAESTHESIOLOGY


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

MD ANESTHESIOLOGY

The curriculum shall train a candidate to manage anaesthesia in a competent, compassionate and caring manner.

Learning shall be self directed and essentially autonomous.

Exposure to all the sub-specialities shall be achieved

A combination of formative and summative assessments shall ensure completion of goals and training.

1. GOALS:

To produce competent and compassionate specialists who

- a) shall recognize the health needs and ethically carry out the professional obligations towards the patient.
- b) shall attain all the required competencies within all the sub-specialities in the speciality of anaesthesiology , enabling good practices at the secondary and tertiary levels of health care delivery.
- c) Shall take effort to be aware and update knowledge about the latest advances and developments in the field.
- d) Shall acquire the basic skills to teach medical and para-medical professionals.
- e) Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- a) Shall orient oneself to the principles of research methodology and epidemiology

2. OBJECTIVES:(Ref: Bloom's taxonomy of learning domains)

A. Knowledge to be gained from the syllabus

B. Skills to be learned from the practical training

C. Attitudes to be developed during the training period

The curriculum shall include

- a) Anatomy, physiology and biochemistry relevant to anaesthesiology.
- b) A thorough knowledge of the pharmacokinetics and pharmacodynamics of anaesthetic drugs for various age groups
- c) Knowledge of cardiovascular, respiratory, neurological, hepatobiliary, renal and endocrine homeostasis and related drugs used in patients undergoing anaesthesia.
- d) Physics and principles involved in the construction and functioning of anaesthesia machine and equipment used to provide anaesthesia and patient vital signs monitoring.
- e) Knowledge of the commonly used techniques in General, Regional and Local anaesthesia
- f) Understanding the concept of unconsciousness and its implications in anaesthesia.
- g) Knowledge and management of acute and chronic intractable pain.
- h) Knowledge of intensive care / therapy.

- i) Knowledge of medical statistics
- j) Knowledge and gain expertise in cardiopulmonary resuscitation.
- k) Knowledge of medical ethics.

The course content should stimulate the thought processes of the candidate and encourage the candidate to acquire new information from books, journals, lectures, seminars and discussions. It should stimulate reflective thinking and problem solving by critical analysis of events during anaesthesia and interpretation of the data and logical reasoning.

3. COMPONENTS OF POST-GRADUATE CURRICULUM

THEORETICAL KNOWLEDGE, PRACTICAL AND CLINICAL SKILLS INCLUDING RESEARCH WORK AND THESIS

FIRST YEAR: BASIC TRAINING

Basic Sciences: Knowledge

Post-graduates should understand the principles involved in the measurement of relevant variables and the requirements of equipment and monitoring in anaesthesia. Knowledge is expected in the areas outlined below.

Physics and Clinical Measurement Principles of Measurement .

- SI units
- Behaviour of fluids (gases and liquids)
- Flow of fluids
- Measurement of volumes, flows, and pressures
- Measurement of temperature
- Humidification
- Oximetry
- Analysis of Anaesthetic gases
- Capnography
- Electrical safety
- Fires and explosions
- Equipment and Apparatus
- Equipment design and standards
- Gas supply in bulk and cylinders
- Anaesthesia delivery system, including pressure valves and regulators
- Vaporisers
- Breathing systems

- Devices to maintain the airway (laryngoscopes, endotracheal tubes, tracheostomy tubes, face masks, laryngeal masks, airways, fiberoptic bronchoscope and video laryngoscope)
- Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU.
- Immune response and anaesthesia
- Information systems
- Data storage and retrieval Monitoring
- Anaesthesia record – Manual and electronic record keeping
- Minimum monitoring standards
- Additional monitoring when appropriate (including central venous pressure, pulmonary artery pressure, cardiac output, cerebral function, temperature, coagulation, blood loss, blood sugar).
- Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.

Preoperative Assessment / Pre-anaesthesia clinics

- Appropriate history taking
- Physical examination including airway assessment, respiratory, cardiovascular, hydration status and neurological examinations for all age groups
- Referral to other specialists when necessary
- Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
- Communication and consultation skills face-to-face, by phone and in writing
- Pulmonary function tests
- Measurement of cardiovascular function
- Interpretation of common radiology and imaging scans and investigations
- Other investigations as appropriate

Conducting Anaesthesia

- Applied cardiac and respiratory physiology
- Applied pharmacology and variability in drug response
- Selection and planning of the anaesthesia technique
- Decision-making relating to postponement or cancellation of surgery
- Routine inhalation and intravenous inductions
- Maintenance of anaesthesia
- Correct usage of anaesthesia delivery systems [low flow Anaesthesia]

- Application and interpretation of monitored variables and neuromuscular blockade
- Use of muscle relaxants
- Application of mechanical ventilation
- Management of the airway and intraoperative complications
- Common regional anaesthesia techniques (eg, epidural and spinal anaesthesia and Regional Nerve blocks)
- Maintenance of accurate records

Postoperative Care

- Safe recovery transport and handover in the post-anaesthesia recovery room
- Post-operative consultations
- Management of postoperative pain, fluid requirements, and nausea and vomiting

Basic Sciences : Skills- Clinical skills

Post-graduates should provide safe anaesthesia care and pain management for uncomplicated patients undergoing non-major surgery.

Post-graduates should be competent in the following technical skills -

- Maintenance of an adequate airway
- Rapid sequence induction
- Basic and advanced Life Support for adult and paediatrics
- Aseptic techniques
- Venous access
- Arterial blood gas collection
- Arterial cannulation
- Central venous cannulation
- ECG recording and interpretation
- Lumbar puncture
- Blood culture collection
- Emergency management of a pneumothorax
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.

Post-graduates should be familiar with the following clinical protocols in the delivery of safe anaesthesia care, and be able to respond accordingly for crisis management.

- Checking of the anaesthesia delivery system
- Airway assessment and anticipation of Difficult airway and its management which may be acute and may be life threatening
- Inadequate airway; failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation .
- Laryngospasm .
- Bronchospasm .
- Hypertension.
- Hypotension.
- Arrhythmias.
- Myocardial Ischemia.
- Hypoxia .
- Hypercarbia.
- Hypoventilation.
- Hyperventilation.
- Hypothermia .
- Hyperthermia .
- Malignant hyperthermia.
- Anaphylaxis .
- Residual neuromuscular blockade.
- Inadequate neuraxial blockade .
- Seizures .
- Gas embolism.
- High ventilator peak inspiratory pressures.
- Pulmonary aspiration .
- Pneumothorax.
- Should learn to organize resources in case of mass casualty.
- Perform triage.
- Assess, transport and manage mass casualties / disaster management and
- camp anaesthesia.
- Manage massive haemorrhage and massive blood transfusion.
- Transport critically ill patient.

Basic Sciences: Skills- Educational skills

- Developing a study plan for the rest of the training period
- Reviewing study plans and correcting for deviations (eg, catching up on deficient knowledge or experience)
- Reflecting on previous learning experiences with the aid of the Learning Portfolio

- Linking basic science teaching with clinical practice & Studying effectively
- Participating in small-group learning and educational activities
- Being aware of decision-making processes
- Managing time effectively for study, work and home/leisure
- Giving and receiving feedback
- Developing insight into personal limitations
- Using the Internet including e-mail
- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Carrying out oral presentations and professional communication.

OBSTETRIC ANAESTHESIA AND ANALGESIA: KNOWLEDGE

- Maternal physiology
- Process of labour and delivery
- Foetal and neonatal physiology
- Placental physiology
- Obstetric and post partum pharmacology
- Endocrine pharmacology
- Pharmacological considerations for newborn resuscitation
- Pharmacology of placental drug transfer
- Anatomy — airway, spine, pelvis, birth canal, gravid uterus, and nerve and blood supply in pregnancy
- Drugs used for fertility support and IVF
- Ecbolics and tocolytics
- Principles of in-vitro fertilisation
- Antenatal care
- Labour and delivery
- Maternal monitoring during labour
- Caesarean section; indications and levels of urgency
- Abortions and septic abortions
- Postpartum period
- High-risk Obstetrics- medical, obstetric or anaesthesia history
- Pre-existing disease in pregnancy
- Substance abuse during pregnancy
- Pre eclampsia and eclampsia, pathophysiology and management
- Obstetric complications, eg, breech, malpresentation, multiple pregnancy and abnormal placentation
- Obstetric interventions; indications and anticipation of anaesthesia and analgesia
- Amniotic fluid, air and pulmonary embolism, pathophysiology and management

- Obstetric haemorrhage- antepartum, peripartum and postpartum
- Foetal and Neonatal Considerations
- Foetal teratogenicity, carcinogenicity, and congenital abnormalities
- Foetal evaluation and monitoring
- Antepartum and intrapartum foetal compromise
- Foetal death in utero; pathophysiology and psychological issues
- Neonatal resuscitation
- Apgar score and neuro-adaptive scores, and their prognostic significance
- Neonatal surgery - Anaesthesia Management
- Pre-anaesthesia assessment of the pregnant patient and identification of high risk patients eg: Risk factors in anaesthesia such as Pre-existing diseases like cardiac disease, hypertension, respiratory disease, diabetes, thyroid disease, intracranial disease, bleeding disorders, renal disease and neuromuscular disease
- Adolescent or elderly primigravid pregnancy
- Morbid obesity
- Thromboembolic disease
- Anaesthesia for non-obstetric surgery in the pregnant patient
- Anaesthesia for elective obstetric procedures
- Anaesthesia for emergency obstetric procedures
- Anaesthesia for Caesarean section
- Pain management in obstetrics – Labour analgesia
- Complications of General Anaesthesia like Difficult airway management, Pulmonary aspiration, Awareness during general anaesthesia
- Complications of Regional Analgesia and anaesthesia, eg, high block, local anaesthetic toxicity, neurological sequelae
- Management of inadequate or failed regional anaesthesia and analgesia
- Management of severe haemorrhage; surgical, antepartum and postpartum
- Maternal morbidity and mortality; incidence and legal and ethical issues
- Organisation of an obstetric anaesthesia and analgesia service
- Safe radiation practice during pregnancy

OBSTETRIC ANAESTHESIA-SKILLS

- Airway assessment in pregnancy
- Rapid sequence induction and Acid Aspiration prevention protocol
- Emergency airway management
- Implementing epidural, spinal, and combined spinal/epidural anaesthesia and analgesia,
- Management of local anaesthetic toxicity
- Management of high regional block

- Management of severe obstetric haemorrhage
Post-graduates should be familiar with clinical drills for crises management especially for airway emergencies
- Failure to intubate algorithm in obstetrics
- Advanced Life Support in the obstetric patient
- Resuscitation of the neonate
- Management of pulmonary aspiration during general anaesthesia

SHOULD DEMONSTRATE AT THE END OF FIRST YEAR

- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS and ALS.

Communication skills

- Call for help in Cardio Pulmonary Resuscitation, PACU, in Emergencies
- Care of terminally ill, Hospices management, Do not resuscitate orders.
- Establishment of rapport with patients, attenders , relatives of patients
Especially in PACU, INTENSIVE CARE UNITS, RECOVERY UNITS to provide reassurance , disclosure of current condition & any procedural information.
- To obtain informed consent from patients or attenders /relatives
- Knowledge of general principles of medical audit and Critical incident reporting.
- Documentation of events correctly /properly for future verification, research activities .
- Knowledge of Hospital, ICU and OT design and planning.

II. SECOND YEAR- ADVANCED TRAINING:

Research and Scientific Enquiry: Knowledge

- Proposing a hypothesis
- Information search and literature review
- Research design, bias and appropriate methods of measurement
- Data collection and storage
- Good record keeping
- Common statistical tests and application of statistics
- Interpretation of results
- Responsibilities of investigator to the ethics committee
- Principles of writing a scientific paper

- ▢ Principles of oral or poster presentation of a paper
- ▢ Ethical principles
- ▢ The process of obtaining funding and writing a basic grant application

Research and Scientific Enquiry : Clinical-Skills

Post-graduates should acquire skills in scientific learning as a medical specialist

- ▢ Conducting and appraising literature searches
- ▢ Appraising journal articles including the application of statistics
- ▢ Applying the principles of evidence-based medicine to clinical practice
- ▢ Carrying out oral presentations and professional communication
- ▢ Presenting quality assurance exercises or projects
- ▢ Developing facilitation skills, such as tutoring in small-group learning and conducting small-group meetings
- ▢ Preparing the thesis protocol with the help of Guide, obtaining approval from Ethics committee
- ▢ Clinical application and performance of thesis/Dissertation in the prescribed period

Research and Scientific Enquiry : Attitudes

Post-graduates should develop an appreciation of and continue research and scientific enquiry

- ▢ Valuing rigorous educational and scientific processes
- ▢ Distinguishing between practice with a sound scientific basis and that which requires further objective assessment
- ▢ Committing to informed consent, confidentiality and all other ethical principles of research
- ▢ Committing to continuing professional development

ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:

KNOWLEDGE

- Preoperative evaluation and resuscitation
- Thromboembolism prophylaxis
- Perioperative and prophylactic antibiotics
- Management of coagulopathies
- Regional anaesthesia for abdominal, vascular, and imaging procedures including anatomy, and physiological and pharmacological aspects
- Informed consent and consent for incompetent patients
- Postoperative care, Management of postoperative pain, phantom-limb pain and pain from injury

Anaesthesia for Trauma Surgery

- Assessment and immediate care; primary and secondary survey, Trauma severity scores
- Emergency airway management
- Establishing intravenous access
- Priorities of resuscitation, investigations, and surgical procedures
- Physio-biochemical effects of trauma
- Managing facial, head and cervical spine injuries
- Glasgow Coma Scale and other scores of consciousness
- Pathophysiology of head injury including changes in cerebral blood flow, cerebral metabolism and intracranial pressure
- Pathophysiology and management of shock
- Pathophysiology of blood loss and massive blood transfusion
- Volume replacement
- Managing abdominal and chest injuries
- Management of burns procedures, including: – Understanding the pathophysiology of burns – Anaesthesia for debridement and skin grafting – Drills in burns resuscitation .
- Managing coagulopathies .
- Transport of ventilated or injured patients including portable ventilators and monitoring systems

Co-existing Medical Conditions Relevant to Anaesthesia

- ❖ Endocrine disorders including phaeochromocytoma, hyperthyroidism, hypothyroidism, and diabetes mellitus
- ❖ Disorders of the cardiovascular system
- ❖ Disorders of the respiratory system
- ❖ Disorders of the nervous system
- ❖ Disorders of the liver, biliary tract and gastrointestinal system
- ❖ Renal disorders
- ❖ Water, electrolyte and acid-base disturbances
- ❖ Haematological disorders, including coagulopathies
- ❖ Skin and musculoskeletal disorders, including rheumatoid arthritis and ankylosing spondylitis
- ❖ Psychiatric disorders and substance abuse
- ❖ Disorders associated with ageing
- ❖ Obesity

ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:

SKILLS:

Post-graduates should provide safe anaesthesia for

- Major abdominal surgery
- Laparoscopic surgery
- Trauma surgery –post-graduates should revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess the patient's status.

Post-graduates should become competent in the following technical skills--

- Securing an airway, arterial and central venous cannulation, and rapid sequence induction
- Cricothyroidotomy and percutaneous tracheostomy
- Cannulation of major vessels for volume resuscitation
- Awake fiberoptic intubation
- Thoracic and lumbar epidural and spinal anaesthesia
- Blood conservation strategies
- Regional nerve blocks for abdominal and lower limb surgery
- Chest drain insertion
- Immobilisation and care of cervical spine injuries
- Post-graduates should be familiar with clinical drills for crises management.
- Airway emergencies eg, “cannot intubate, cannot ventilate”, difficult airway, hypoxia and abnormal end-tidal CO₂ levels
- Managing major intraoperative events in aneurysm and abdominal surgery
- Drill for the primary and secondary survey
- Drill for raised intracranial pressure
- Drill for tension pneumothorax
- Drill for managing severe haemorrhage
- Drill for managing cardiac arrest (ACLS Algorithm)
- Drill for managing malignant hyperthermia

ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery: Knowledge

- Cardiovascular, respiratory and neurological physiology
- Physiology of gases in closed body cavities
- Pharmacology of local anaesthetic agents
- Pharmacology of local vasoconstrictors
- Anatomy of the head and neck and abnormal facies
- Anatomy of the airway, nasal passages, larynx, pharynx and middle ear
- Effects of surgery and radiation on the airway

- ▯ Monitoring in anaesthesia
- ▯ Neurological monitoring
- ▯ Lasers-- types, uses in surgery, complications and precautions
- ▯ Airway devices and types of tracheal tubes, eg, Micro-laryngeal, Rae tubes
- ▯ Equipment for difficult tracheal intubation
- ▯ Equipment for jet ventilation

Anaesthesia for ENT surgery

- ▯ Pre-operative airway assessment
- ▯ Tonsillectomy and adenoidectomy, including quinsy and postoperative bleeding
- ▯ Microlaryngoscopy
- ▯ Radical head and neck surgery
- ▯ Laryngectomy and Pharyngolaryngectomy
- ▯ Laser surgery .
- ▯ Nasal and sinus operations.
- ▯ Parotid tumor surgery .
- ▯ Myringoplasty .
- ▯ Middle ear surgery.
- ▯ Microsurgery of the ear.
- ▯ Managing partial airway obstruction including: –
- ▯ Epiglottitis
- ▯ Foreign bodies – Airway And Esophagus
- ▯ Laryngeal tumours
- ▯ Oropharyngeal cysts and abscesses
- ▯ Elective and emergency tracheostomy
- ▯ Paediatric problems, eg, relating to disease, airway, larynx and craniofacial disorders
- ▯ Post-operative care

Anaesthesia for Dental surgery

- ▯ Outpatient dental procedures- sedation and general anaesthesia
- ▯ Inpatient dental surgery
- ▯ Dental procedures on the mentally challenged
- ▯ Dental procedures on patients with bleeding disorders
- ▯ Oral surgery
- ▯ Fractured jaw
- ▯ Maxillary fractures according to the Le Fort classification
- ▯ Dental sepsis

Anaesthesia for Eye surgery

- ▯ Anatomy and physiology of extremes of age
- ▯ Anatomy of orbit and contents
- ▯ Physiology of intraocular pressure
- ▯ Ocular perfusion
- ▯ Eye reflexes (oculocardiac, oculorespiratory, oculoemetic)
- ▯ Anatomy of orbit, extraocular muscles, blood vessels, lacrimal apparatus

- ▯ Local anaesthetic agents for eye surgery
- ▯ Other drugs for eye surgery, eg, topical agents, vasoconstrictors, mydriatics, miotics, and agents to reduce intraocular pressure
- ▯ General anaesthesia for eye surgery including:
 - ▯ Examination under anaesthesia
 - ▯ Laser eye surgery
 - ▯ Intraocular surgery
 - ▯ Extraocular surgery
 - ▯ Retinal detachment
 - ▯ Plastic and orbital surgery
 - ▯ Emergency eye surgery and use of suxamethonium in penetrating eye injury
 - ▯ Monitoring
 - ▯ Postoperative care, management of nausea and vomiting
- ▯ Principles of regional retrobulbar and peribulbar block and choosing between general and regional anaesthesia techniques
- ▯ Sedation for eye procedures
- ▯ Principles of anaesthesia for day-case
- ▯ Paediatric considerations

Anaesthesia for Maxillofacial, Thyroid, and Head and Neck Surgery

- ▯ Pre-operative airway assessment
 - ▯ Management of anaesthesia for major maxillofacial surgery, which may involve prolonged anaesthesia, major blood loss, hypothermia and multiple procedures
 - ▯ Management of anaesthesia for facial trauma: emergency and semi-elective, including fractured jaw and maxilla
 - ▯ Management of anaesthesia for cancer, plastic and cosmetic surgery on the face, head and neck, including surgery for cleft palate
 - ▯ Management of thyroid surgery, including Anaesthesia for thyroid and parathyroid surgery
 - ▯ preparation and management of thyroid and parathyroid disorders preoperatively
 - ▯ Post thyroidectomy bleeding
 - ▯ Managing a “thyroid storm”
- Identification and management of nerve supply of larynx
- ▯ Sedation for head and neck procedures
 - ▯ Post-operative care

ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery : Skills

- ▯ Tracheal intubation
- ▯ Nasal intubation
- ▯ Use of special tubes
- ▯ Placement and removal of packs
- ▯ Applying topical local anaesthesia to the airway
- ▯ Securing the difficult airway

- ▢ Recognising the high-risk airway
- ▢ Use of stylets and bougies
- ▢ Awake intubation
- ▢ Retrograde catheter technique
- ▢ Fibreoptic intubation
- ▢ Laryngeal mask airway intubation
- ▢ Failed intubation or ventilation drill
- ▢ Cricothyroidotomy and percutaneous tracheostomy
- ▢ Transtracheal ventilation
- ▢ Managing the airway in trauma and burns
- ▢ Upper airway obstruction drill
- ▢ Post extubation drill for difficult airway
- ▢ Spontaneous gaseous induction for airway obstruction
- ▢ Regional and local anaesthesia of the head and neck
- ▢ Management of postoperative nausea and vomiting in head and neck surgery
- ▢ Management of postoperative facial and airway swelling.

Paediatric Anaesthesia: Knowledge

- ▢ Anatomy relevant to airway management and breathing
- ▢ The physiology of respiration, circulation, fluid balance and thermoregulation
- ▢ The pharmacology of anaesthetic agents, analgesics and common paediatric medications, especially the relationship of dose to the size/maturity of child
- ▢ The relevance of surface area of children of various ages
- Stages of development of the normal child and their relevance to hospitalization

General principles of perioperative management relevant to children, emphasising:

- ▢ common childhood illnesses and their influence on anaesthesia and surgery
- ▢ fasting guidelines
- ▢ fluid and electrolyte replacement
- ▢ temperature control
- ▢ specialised equipment for children of different sizes
- ▢ perioperative monitoring
- ▢ dosage and administration of emergency drugs
- ▢ postoperative apnoea detection and management
- ▢ acute and persistent pain management
- Relevant features of important childhood conditions: respiratory infections, asthma
- ▢ prematurity and its complications
- ▢ facial anomalies affecting the airway

- Neonatal emergencies
 - ▢ respiratory distress,
 - ▢ tracheoesophageal fistula,
 - ▢ congenital diaphragmatic hernia,
 - ▢ necrotising enterocolitis,
 - ▢ abdominal wall defects
 - other childhood emergencies- inhaled/ingested foreign bodies, fractures, head injuries and burns /Scalds
 - ▢ congenital cardiac disease; especially ASD, VSD, Tetralogy of Fallot
 - ▢ cerebral palsy
 - ▢ chronic diseases of childhood; especially cystic fibrosis, muscular dystrophy
 - ▢ congenital syndromes- Down's, Pierre-Robin, mucopolysaccharidoses
 - ▢ malignancy and the treatment of malignancy
 - ▢ renal failure
- Malignant Hyperthermia

Paediatric anaesthesia Knowledge-Clinical management

Applying principles of paediatric anaesthesia for the following surgical subspecialties:

- ▢ Neurosurgery
- ▢ Ophthalmology
- ▢ Dental surgery
- ▢ Plastics and reconstructive surgery
- ▢ Thoraco-abdominal surgery
- ▢ Cardiac surgery and procedures
- ▢ Urology surgery and procedures/investigations
- ▢ Orthopaedic Surgery
 - Otolaryngology
- ▢ General surgery
- ▢ Trauma and Burns

Applying principles of paediatric anaesthesia for diagnostic procedures

- ▢ Recognising and managing the sick child
- ▢ Recognising and managing reversal to transitional fetal circulation
- ▢ Managing fluid therapy in paediatric patients
- ▢ Managing specific childhood syndromes and disorders
- ▢ Applying principles of paediatric anaesthesia for procedures outside the operating theatre, including patient transport
- ▢ Caring for paediatric patients undergoing imaging investigations, which may require sedation or anaesthesia

- ▯ Recognising and managing paediatric emergencies including basic and advanced life support Management of patients requiring paediatric intensive care, ventilatory management, and support of circulation.
Resuscitation of neonates and children of all ages. [PALS]
- ▯ Understanding the organisation of a paediatric anaesthesia and analgesic service

Paediatric Anaesthesia: Skills

Post-graduates should demonstrate decision-making and clinical skills, and perform

- ▯ Paediatric advanced life support
Manage emergencies and conditions including
- ▯ Hypoxia
- ▯ Bronchospasm
- ▯ Apnoea
- ▯ Upper airway obstruction including upper airway infection
- ▯ Bradycardia and other arrhythmias
- ▯ Cardiac arrest
- ▯ Hypovolaemia
- ▯ Neurological compromise
- ▯ Epiglottitis and croup
- ▯ Inhaled foreign body
- ▯ Infantile airway obstruction
- ▯ Laryngospasm
- ▯ Masseter spasm
- ▯ Postoperative stridor
- ▯ Aspiration of gastric contents

Technical skills, such as airway management, vascular cannulation and regional anaesthesia should be demonstrated for paediatric patients

Interpersonal skills in dealing with paediatric patients and their parents

Intensive Care: Knowledge

Understanding the spectrum of critical illnesses requiring admission to ICU.

- Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
- Principles and application of Oxygen Therapy
- Glycemic control in the critically ill patient
- Practice of Hypothermia and prevention of cerebral injury after cardiac arrest

- Delivering appropriate nutritional support - enteral and parenteral.
- Proper use of sedative/hypnotic drugs in the ICU.
- Practicing ethical and legal aspects of critical care
- Good communication skills with patient and relatives

Acute Circulatory Failure

- ▢ Classification, causes, pathogenesis and sequelae of shock
- ▢ Principles of management of all forms of shock
- ▢ Monitoring in the management of shock
- ▢ Causes of cardiorespiratory arrest and the effects on body systems
- ▢ Cardiopulmonary resuscitation and external defibrillators
- ▢ Cardiac dysrhythmias and their current therapies
- ▢ Valvular heart disease
- ▢ Endocarditis
- ▢ Pulmonary embolism
- ▢ Congestive cardiac failure
- ▢ Anaphylaxis
- ▢ Ischaemic Heart Disease and Myocardial Infarction
 - Factors involved in the balance of oxygen supply and demand to the heart
 - Aetiology of coronary artery disease and its effects
 - Signs and symptoms of ischaemic heart disease
 - Signs and symptoms of myocardial infarction
- ▢ Principles of the management of acute myocardial infarction including thrombolysis, angioplasty and surgery
- ▢ Indications for a transvenous pacemaker
- ▢ Right heart catheterisation, angiography and echocardiography
- ▢ Long-term effects of acute myocardial infarction and late complications

Respiratory Failure

- ▢ Causes and pathogenesis of respiratory failure
- ▢ Oxygen therapy and mechanical ventilatory support (invasive and noninvasive)
- ▢ Respiratory disease processes & representative conditions
- ▢ Cardiogenic/non-cardiogenic pulmonary oedema/ARDS
- ▢ Airway obstruction
- ▢ Airway stenosis and tracheomalacia
- ▢ Bronchopleural fistula
- ▢ Pneumothorax
- ▢ Aspiration syndromes
- ▢ Fat embolism
- ▢ Pneumonia (community and nosocomial)
- ▢ Chronic airway limitation
- ▢ Asthma

Renal Failure

- ▢ Definitions of acute and chronic renal failure
- ▢ Causes and pathogenesis of renal failure
- ▢ Acute renal failure
- ▢ Principles of renal replacement therapy and their indications

Neurological Failure

- ▢ Definition and causes of coma
- ▢ Causes, pathogenesis and treatment of cerebral swelling and raised intracranial pressure
- ▢ Principles of cerebral function monitoring, especially intracranial pressure
- ▢ Principles of diagnosing brain stem death
- ▢ Representative conditions to be understood:
 - ▢ Acute vascular disorders of the central nervous system
 - ▢ Acute infective disorders of the central nervous system
 - ▢ Cerebral oedema
 - ▢ Brain stem death
 - ▢ Seizures
 - ▢ Hemiplegia, paraplegia, quadriplegia
 - ▢ Guillain Barre syndrome
 - ▢ Peripheral nerve and or muscle dysfunction associated with critical illness
 - ▢ Myasthenia gravis
 - ▢ Hyperthermia, hypothermia
 - ▢ Tetanus
 - ▢ Delirium

Severe Trauma

- ▢ Effects of severe trauma on organs and organ systems
- ▢ Principles of EMST for the management of trauma and advantages of an organized team approach
- ▢ Technique of cricothyroidotomy/ tracheostomy/mini-tracheotomy
- ▢ Principles of the management of head injury and Glasgow Coma Scale
- ▢ Management of cervical spine injuries
- ▢ Principles of the safe transfer of injured children and adults and portable monitoring systems

Sepsis

- ▢ Definition, pathogenesis and pathophysiology of sepsis and related syndromes
- ▢ Risk factors for nosocomial infection
- ▢ Infection control measures in ICU and operating suites

Supportive Care of Critically Ill Patients

- ▢ Inotropic Therapy
- ▢ Recognise when to use inotropic or vasopressor therapy
- ▢ Choose an appropriate agent, dose, physiological endpoint, rate and route of administration
- ▢ Review the efficacy of inotropic therapy at regular intervals
- ▢ Provide appropriate nutritional support and General Care
- ▢ Appropriate plan for care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength

Intensive Care: Skills

- ▢ Cardiovascular Related
 - ▢ Choosing and using inotropic agents, vasodilators, and vasoconstrictors
 - ▢ Managing dysrhythmias **and Dyselectrolytemia**
 - ▢ Choosing and using antimicrobial agents in heart disease
 - ▢ Assisting with intra-aortic balloon pumping
- ▢ Cardioversion
- ▢ Advanced life support
- ▢ Respiratory Related
 - ▢ Oxygen therapy
 - ▢ CPAP & Non-invasive ventilation
 - ▢ Mechanical ventilation, including modes of ventilation
 - ▢ Pleural drainage
 - ▢ Percutaneous tracheostomy
 - ▢ Fiberoptic bronchoscopy
- ▢ Renal Failure
 - ▢ General care of continuous dialysis and haemofiltration techniques
- ▢ Neurological Failure
 - ▢ Maintaining cerebral perfusion pressures and intracranial pressures
 - ▢ Gastro-intestinal Hemorrhage management
- ▢ Assisting with placing a Sengstaken Blakemore tube.

Diagnostic imaging and interventional procedures (radiology and cardiology):

Knowledge

- ▢ Preanaesthetic preparation
- ▢ Techniques appropriate for adults and children for CT scanning, MR imaging and interventional radiology, Onco radiotherapy, Electroconvulsive shock therapy (modified ECT. angiography and interventional cardiology
- ▢ Post-investigation care

Diagnostic imaging and interventional procedures (radiology and cardiology): Skills

- ▢ Pre-anaesthetic preparation
- ▢ Sedation and general anaesthetic techniques for:
 - ▢ angiography and interventional procedures
 - ▢ CT scanning, adults and children
 - ▢ Magnetic resonance imaging
 - ▢ Problems due to magnetic field
 - ▢ Post-investigation care

Pain Medicine: Knowledge

- ▢ Overview of “Pain Pathways”
- ▢ Multi dimensional aspects of pain; role of physiological, psychological and environmental factors
- ▢ Pharmacology of Analgesic Agents
- ▢ Pharmacokinetic and pharmacodynamic principles, drug interactions, and side effects.

Knowledge of the pharmacology of:

- ▢ Opioids
- ▢ Paracetamol
- ▢ Non-steroidal anti-inflammatory agents (NSAIDs)
- ▢ Antidepressants (TCAs and SSRIs)
- ▢ Anticonvulsants
- ▢ Membrane-stabilising agents
- ▢ Alpha-2 agonists
- ▢ NMDA-receptor antagonists
- ▢ Local anaesthetics
- ▢ Anti-emetics
- ▢ Agents used to treat hypotension associated with neuraxial blockade
- ▢ Awareness of the role of the following in pain management
- ▢ Anti-migraine agents
- ▢ Steroidal anti-inflammatory agents
- ▢ Topical agents (NSAIDs, Capsaicin)
- ▢ Neurolytic agents
- ▢ Experimental agents for analgesia
- ▢ Knowledge of different routes of analgesic drug delivery, including factors governing choice of route, side effects relevant to particular route, Principles of additive and synergistic effects when agents are combined
- ▢ Oral
- ▢ Intramuscular
- ▢ Subcutaneous (including continuous infusion)
- ▢ Intravenous (including continuous infusion)

- ▢ Patient-controlled analgesia (PCA) via different routes (ie intravenous, subcutaneous, intranasal, epidural, intrathecal)
- Other-methods- topical, transdermal, rectal, transmucosal (intranasal, inhalational and sublingual / buccal), intra-cerebroventricular, intraarticular, infiltration under skin

Psychological and Sociocultural Issues

The importance of psychological (emotional and cognitive), social, and other factors in the presentation and management of pain with emphasis on:

- ▢ Factors involved in the wide variation in individual response to tissue injury
- ▢ The relationship between depression and persistent pain
- ▢ The role of anxiety and/or depression in acute pain
- ▢ Differentiation of active and passive coping strategies
- ▢ The role of illness behaviour
- ▢ The influence of the health care provider on the response to pain treatment
- ▢ The importance of an interdisciplinary approach to pain assessment and treatment including the potential role of other members of the pain team (particularly psychiatrist, clinical psychologist, physiotherapist, nursing staff, occupational therapist, social worker)
- ▢ The placebo effect and its implications for treatment of pain

Pain Assessment and Measurement

Assess pain and outcome of pain treatment using history, clinical examination and pain measurement tools.

Recognise the limitations of pain measurement techniques, particularly in some patient groups (eg, persistent pain, children, those with cognitive impairment)

Understanding of – Neuroendocrine and metabolic responses to surgery stressors and impact of analgesic techniques

- ▢ Consequences of poorly controlled pain
- ▢ Current evidence for and against pre-emptive analgesia and clinical implications
- ▢ Current evidence for the effect of analgesic technique on morbidity and mortality
- ▢ Importance of aggressive multimodal postoperative rehabilitation
- ▢ Relationship between acute and persistent pain including factors involved in progression from one to the other, and potential interventions to prevent such progression

Choose the most appropriate technique of acute pain management –

- ▢ Pharmacological techniques (opioid and non-opioid) via a variety of routes
- ▢ Regional techniques including central neuraxial, plexus and peripheral nerve blockade
- ▢ Non-pharmacological techniques

Formulate a pain management plan based upon –

- ▢ Patient preference, physical and mental status, and available expertise and technology
- ▢ Special requirements in specific patient groups (eg, the elderly, children, pregnant and postpartum patients, Obstructive sleep apnoea, concurrent hepatic or renal disease; non-English speaking, cognitive impairment)

- ▢ Special requirements in patients with opioid-tolerance and/or a substance abuse disorder including an understanding of guidelines and regimens for analgesic drug use (equi-analgesic] dosing for opioids; tolerance and dependence)
- ▢ Special requirements under specific clinical situations (eg, spinal injuries, burns, acute back pain, musculoskeletal pain, acute medical pain, acute cancer pain and patients in Intensive Care and the Emergency Department)
- ▢ Include in a pain management plan
- ▢ Appropriate evaluation of the patient's pain
- ▢ Informed consent, including disclosure of risk and appropriate documentation
- ▢ Patient education about the selected technique and alternatives
- ▢ Recognise common presentations of acute musculoskeletal pain (eg, rib fracture, acute back pain) and other non-surgical acute pain syndromes (migraine, renal colic) including in the Emergency Department and Intensive Care Unit
- ▢ Identify when to seek advice from, or refer to, a Pain Medicine Specialist

Cancer Pain

Undertake assessment of pain in patients with cancer based on –

- ▢ Understanding of the multiple potential aetiologies of pain associated with cancer
- ▢ Differentiation between somatic, visceral, and neuropathic pain
- ▢ Evaluation of psychological, social, cultural and spiritual issues
- ▢ Undertake treatment of cancer-related pain syndromes based on therapies available (including chemotherapy, radiotherapy, surgery, invasive and non-invasive analgesic techniques, and psychological approaches)
- ▢ Understand guidelines and regimens for analgesic drug use including equianalgesic dosing for opioids; tolerance and dependence and their management in the patient with cancer
- ▢ Identify when to seek advice from, or refer to, a Palliative Medicine Specialist

Neuropathic Pain

- ▢ Understand diagnostic criteria, clinical features and management of specific neuropathic pain syndromes including–
- ▢ Central pain (pain after stroke, thalamic pain, spinal cord injury pain, deafferentation pain, phantom limb pain)
- ▢ Neuralgias (trigeminal neuralgia, postherpetic neuralgia, occipital neuralgia)
- ▢ Painful peripheral neuropathy (eg, metabolic, toxic, ischaemic)
- ▢ Pain after nerve injury (eg, neuroma)
- ▢ Post-surgical pain syndromes (eg, post-thoracotomy, post-CABG pain, postmastectomy, postamputation)
- ▢ Complex regional pain syndrome types I and 2 (including the differentiation of Sympathetically maintained from sympathetically independent pain)

- ▢ Recognise and understand the ways in which acute and persistent pain in children differ from pain in adults, including–
- ▢ The effect of developmental stage on assessment and management of pain in children
- ▢ The selection of pain assessment tools for children of different developmental stages
- ▢ Principles of managing acute, procedural and persistent pain in children

Pain in the Elderly:

- ▢ The epidemiology of pain syndromes in the elderly
- ▢ Physiological changes associated with ageing and effects of these on pain and pain management (including changes in pharmacokinetics, pharmacodynamics, and pain biology)
- ▢ Effects of concurrent disease, and psychological, social and cognitive changes on assessment and management of pain
- ▢ Risks associated with polypharmacy in the elderly

Demonstrate Organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients, Physiological changes secondary to Pain, practice different modalities of pain control. Pharmacology and side effects of opioid analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Pharmacology and side effects of epidural/intra-theal opioid. Neurological assessment of epidural blockade and management of failed block. Management of regional blockade – brachial plexus, para-vertebral and intra-pleural block. Management of epidural abscess. Substance abuse and acute pain control. Pain control in concurrent medical diseases – COAD, IHD, bleeding tendency, geriatric. Pain control in burns patients. Pain control in trauma patients included multiple rib fracture.

Demonstration of abilities to manage Chronic Pain

- ☞ Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuroablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
- ☞ Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).
- ☞ Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lower back pain, intractable angina, burns, chronic pancreatitis, PVD.
- ☞ Practice Epidural steroid injection (all levels) and long-term epidural

Pain Medicine: Skills-Clinical Evaluation

- ▢ Post-graduates should demonstrate skills in the clinical evaluation of patients with acute and persistent pain by: .
- ▢ Obtaining a specific pain history – Onset, location, nature, duration, intensity, aggravating and relieving factors
- ▢ Physical, psychological and social consequences of the patient's pain
- ▢ Current and past pain treatments and outcome
- ▢ Other relevant history (past patterns of drug use or misuse, family history, medical and surgical history)
- ▢ Treatment expectations
- ▢ Interpreting relevant investigations
- ▢ Formulating a management plan and evaluating outcome

Pain Medicine-Technical Skills

Post-graduates should become competent in-

- ▢ Central neuraxial blocks
- ▢ Regional techniques (including knowledge of anatomy, technique, indications, contraindications, complications and their management) including
- ▢ Peripheral and plexus blocks of the upper and lower limb
- ▢ Head and neck blocks
- ▢ Truncal blocks including intercostal and paravertebral block

Trainees need to understand the anatomy, technique, indications, contraindications, complications and management of

- ▢ Stellate ganglion blockade
- ▢ Coeliac plexus blockade
- ▢ Lumbar sympathetic blockade
- ▢ Intrathecal drug delivery for cancer and persistent pain.

III YEAR ADVANCED TRAINING

Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease : Knowledge

- ▢ Pathophysiology, investigation, diagnosis, anaesthesia implications, and management of:
- ▢ Ischaemic heart disease
- ▢ Congenital heart disease
- ▢ Valvular heart disease
- ▢ Hypertension
- ▢ Cardiac arrhythmias
- ▢ Other acquired diseases, eg, myxomas, cardiomyopathies
- ▢ Understanding the principles of anaesthesia and perioperative care for patients with:

- ▢ Recent myocardial infarction
- ▢ Ischaemic heart disease
- ▢ Cardiac valvular lesions
- ▢ Congenital heart disease, corrected and uncorrected
- ▢ Hypertensive disease
- ▢ Cardiac arrhythmias
- ▢ Other acquired diseases, eg, myxomas, cardiomyopathies
- ▢ Cerebrovascular disease
- ▢ Peripheral vascular disease

Anaesthesia for Cardiac Surgery-- Understanding the anaesthesia, complications and perioperative care (including analgesia) of:

- ▢ Coronary revascularisation with/without cardiopulmonary bypass
- ▢ Valvular repair or replacement
- ▢ Emergency cardiac surgery
- ▢ Cardioversion
- ▢ Procedures in the cardiac catheterisation laboratory
- ▢ Electrophysiological procedures
- ▢ Congenital heart disease surgery (paediatric and adult)
- ▢ Procedures on the great vessels, eg, for aortic dissection
- ▢ Heart or heart/lung transplantation

Anaesthesia for Vascular Surgery --Understanding the anaesthesia, complications and perioperative care (including analgesia) of:

- ▢ Surgery on the vessels supplying the head and neck
 - ▢ Surgery on the abdominal vessels
 - ▢ Surgery on the limb vessels
 - ▢ Minimally invasive procedures on the vessels (eg, intraluminal stenting)
- Understanding the principles, role, and management of procedures, problems, or events associated with anaesthesia for cardiac and vascular surgery, including:
- ▢ Myocardial protection strategies
 - ▢ Cerebral protection
 - ▢ Spinal cord protection
 - ▢ Blood coagulation and anticoagulation and its monitoring
 - ▢ Perioperative arrhythmias
 - ▢ Poor cardiac output states
 - ▢ Temperature management (including deep hypothermic circulatory arrest)
 - ▢ Cardiopulmonary bypass including weaning from bypass and ECMO
 - ▢ Cross-clamping of the aorta

Organ Transplantation -- Anaesthesia for organ transplantation including:

- ▢ Legal and ethical considerations of organ harvesting and transplantation
- ▢ Brain death and the legal definition of death
- ▢ Physiological and pharmacological considerations

Protocols and planning Anaesthesia for Patients with Pulmonary Disease Chronic respiratory disease, pathophysiology, diagnosis

- ▢ Preoperative evaluation of patients with respiratory diseases
- ▢ Lung function tests
 - Thoracic trauma Anaesthesia and Perioperative Care (including Analgesia) for Thoracic Surgery
- ▢ Preoperative assessment for fitness for lung surgery and one-lung ventilation
- ▢ Thoracotomy and – Lung resection, including pneumonectomy and lung reduction surgery
- ▢ Mediastinal mass resection
- ▢ Oesophageal surgery
- ▢ Surgery on the thoracic aorta
- ▢ One-lung anaesthesia, including management of hypoxia and ventilation
- ▢ Differential lung ventilation
- ▢ Tracheal and bronchial surgery (including use of lasers and stents)
- ▢ Thoracoscopic procedures
- ▢ Bronchoscopy, including removal of foreign body
- ▢ Mediastinoscopy
- ▢ Lung or heart/lung transplantation
- ▢ Management of problems or critical events : –
 - ▢ Fluid management postpneumonectomy
 - ▢ Cardiac herniation postpneumonectomy
 - ▢ Bronchopleural fistula
 - ▢ Lung bullae and cysts
 - ▢ Tension pneumothorax
 - ▢ Superior vena cava obstruction
 - ▢ Empyema
- Understanding the types and uses of endotracheal, double-lumen, and endobronchial tubes and bronchial blockers
- Understanding chest tube drainage systems and suction

ANAESTHESIA AND PERIOPERATIVE CARE (INCLUDING ANALGESIA) FOR PATIENTS WITH CARDIAC AND VASCULAR DISEASE “ SKILLS – CLINICAL

Post-graduates should be Competent in the following

- ▢ Fibreoptic bronchoscopy
- ▢ Placement and use of vascular monitoring lines (arterial, central venous, pulmonary artery, and femoral and neck vessels)
- ▢ Basic trans-oesophageal echo examinations (subject to local practices)
- ▢ Use of cardiac pacemakers
- ▢ Placement of endobronchial tubes and blockers
- ▢ Use of bougies and tube exchangers

Post graduates should be able to perform

- ▢ Interpretation of ECGs and ECG monitoring
- ▢ Interpretation of chest x-rays and common chest CT and MRI imaging films
- ▢ Assistance with cardiopulmonary bypass
- ▢ Placement and care of chest drains and appropriate use of suction

NEUROANAESTHESIA: KNOWLEDGE

- ▢ Neuro anatomy -- Central nervous system, Spinal cord and meninges
- ▢ Ventricular system and flow of CSF
- ▢ Blood supply to brain and spinal cord
- ▢ Cranial vault and spinal column
- ▢ Cerebral blood flow and Cerebral blood volume
- ▢ Cerebral metabolism
- ▢ Cerebrospinal fluid dynamics and physiology
- ▢ Intracranial pressure
- ▢ Blood-brain barrier
- ▢ Physiology and metabolism of normal and abnormal brain and spinal cord
- ▢ Physiological and metabolic effects of anaesthesia on brain and spinal cord
- ▢ Abnormal water and sodium homeostasis
- ▢ Temperature and CNS function
- ▢ Pharmacology relevant to neuroanaesthesia:
 - ▢ Sedatives
 - ▢ Hypnotics
 - ▢ Analgesics
 - ▢ Inhalation agents
 - ▢ Neuromuscular blocking drugs
 - ▢ Anticholinesterases
 - ▢ Neuroprotection
 - ▢ Diuretics
 - ▢ Hypotensive agents
 - ▢ Vasopressors

- ▢ Corticosteroids
- ▢ Drug interactions with neuromuscular disorders
- ▢ Principles of clinical measurement and monitoring in neuroanaesthesia, including techniques and clinical importance.
- ▢ Haemodynamic and respiratory monitoring
- ▢ Cerebral blood flow
- ▢ Intracranial pressure (ICP) and cerebral perfusion pressure
- ▢ Cerebral metabolism
- ▢ Transcranial doppler ultrasonometry
- ▢ Electrophysiological monitoring, eg, electroencephalogram and evoked potentials
- ▢ Electrical safety standards

Interventions to minimise Cerebral Damage

- ▢ Principles of cerebral protection
- ▢ Haemodynamic stability
- ▢ Fluid and osmotic therapy
- ▢ Management of intracranial hypertension
- ▢ Sedation and ventilatory support

Anaesthesia for Neurosurgery

- ▢ Understanding the assessment, anaesthesia and perioperative care of patients for:
- ▢ Intra cerebral vascular surgery
- ▢ Extra cerebral vascular surgery
- ▢ Supratentorial surgery
- ▢ Posterior fossa surgery
- ▢ Pituitary surgery
- ▢ Epilepsy surgery
- ▢ 'Awake craniotomy'
- ▢ Craniofacial and craniobasal surgery
- ▢ Spinal surgery
- ▢ Emergency spinal cord decompression
- ▢ Paediatric neurosurgery

Principles, role and management of procedures, problems, or events associated with anaesthesia for neurosurgery: –

- ▢ Positioning for neurosurgery
- ▢ Use of inhalation or total intravenous general anaesthesia
- ▢ Induced hypotension
- ▢ Induced hypertension
- ▢ Hypothermia
- ▢ Sitting position

- ▢ Air embolism; precautions, diagnosis and management
- ▢ Injury of head, spinal column and neurological injuries
- ▢ Epilepsy and other neurological disorders
- ▢ Paediatric considerations

Neuroanaesthesia: Skills

- ▢ Pre-anaesthesia preparation for neuroanaesthesia
- ▢ Monitoring in neuroanaesthesia – setting up and calibration, placement of cannulae, interpretation of variables
- ▢ Post-anaesthesia care and post neurosurgical care
- ▢ Protocols and drills for
- ▢ Failed airway intubation
- ▢ Reducing raised ICP
- ▢ Suspected cervical spine injury
- ▢ Intraoperative air embolism
- ▢ Initial management of a head injury
- ▢ Positioning of patients.

Special procedures which the post graduate student must be able to perform at the end of 3 years

1. Failed intubation drill (includes Fiberoptic Laryngo/Bronchoscope)
- 2 . Double Lumen Tube
3. Bronchial Blocker placement
- 4 Jet Ventilation
5. Suctioning and physiotherapy of wet lung
6. Intubation in Neonates
7. Initiation and management of ventilation
8. Combined Spinal Epidural
9. Brachial Plexus Block
10. Intravenous Regional Anaesthesia
11. Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle - each
- 12 Cervical-Superficial and Deep, Stellate, Splanchnic - each
13. Central Venous Line by Brachial, Jugular and Subclavian veins
14. Radial and Femoral Artery cannulation
15. CVP monitoring
16. Pulmonary Capillary Wedge Pressure [observed]
17. Neuro-muscular transmission Monitoring
18. Anaesthetic Depth eg. BIS monitoring [observed]

ATTITUDES INCLUDING COMMUNICATION AND BEHAVIOUR FOR THE POST-GRADUATES:

To learn the attributes of a

- Medical expert
- Communicator
- Collaborator
- Manager
- Teacher
- Professional
- To practise good communication with colleagues, patients and others
- To work as a member of a team, but to assume responsibilities and/or delegate duties as a team leader when necessary
- To commit to, and believe in, a culture of safety and ethical, high quality care
- To accept that medical knowledge and skills are not the only requirements of specialist practice
- To be aware of medicolegal obligations relating to medical practice
- To have insight into one's own limitations, abilities and areas of expertise
- To commit to continuing professional development.

TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS

Students should compulsorily attend the research Methodology workshop conducted by the University **within first six months of the M.D course.**

Students are encouraged to attend workshops/CME's on Bioethics **conducted by the University and other reputed Institutions.**

Medical ethics, bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus

Professionalism and Ethics

To commit to, and believe in the ethical and professional principles –

- The best care for the patient must be the principal driving force of practice
- *Patient autonomy*: patients' ability to determine their treatment
- *Beneficence*: the principle of “doing good” to patients
- *Non-maleficence*: the principle of not doing harm to patients

- ▯ *Fidelity*: faithfulness to one's duties and obligations. This principle underlies excellence in patient care, confidentiality, telling the truth, a commitment to continuing professional development and lifelong learning, and not neglecting patient care
- ▯ *Social justice*: the right of all patients to be fairly treated
- ▯ Duty to oneself in terms of personal health care, and maintenance of competence to practise
- ▯ *Accountability*: the anaesthetist is responsible for his/her actions
- ▯ Honour and integrity in all conduct, including the generation and use of resources
- ▯ Respect for others, work as a team and practise conflict resolution
- ▯ Appropriate response to clinical error

Patient Considerations

To commit to, and believe in, the rights of patients with respect to:

- ▯ Autonomy
- ▯ Confidentiality of the doctor-patient relationship
- ▯ Appropriate, excellent clinical care, including pre-operative assessment
- ▯ Informed consent
- ▯ Comprehension of the risks of anaesthesia techniques
- ▯ Appropriate care irrespective of race, culture, gender and socio-economic status
- ▯ Research Considerations
- ▯ To value rigorous educational and scientific processes
- ▯ To commit to the ethical principles of research

4. STRUCTURED TRAINING PROGRAMME

Duration of the training 3years

Orientation-

- ▯ To the hospital, wards, operation theatres and peripheral areas
- ▯ Anesthesiology as a subject
- ▯ Assigning Thesis guides

Objectives for 1st year

- Orientation- To the hospital, wards, operation theatres and peripheral areas and also to Anaesthesiology as a subject
- To observe and learn assessment and management of cases in ASA I and II in the specialities of General Surgery, Orthopaedics, Gynaecology and Recovery room. The level of supervision is slowly graded to facilitate independent management of general and spinal anaesthesia.
- Should learn the basic principles of safe and effective anaesthesia, resuscitation, and both the prevention and treatment of pain, perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.
- They should attend the practical guidance workshop on research methodology and should have a knowledge about basic concepts of research, biostatistics etc.
- He/she should select the thesis topic and submit the protocol for his thesis.
- **Should have attend and got trained in BLS, ACLS, PALS and ATLS**

Objectives for 2nd year

The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision

- General and regional anaesthesia (including epidural, nerve and plexus blocks) for ASA III AND IV cases in the specialities of Paediatrics, ENT, Dental, ICU, Obstetrics, Eye, Urology, Pain, Peripheral areas and Trauma.
- The post-graduate should be able to analyse a journal article and data and able to present free papers in conferences and should attend continuous education programme & workshops.
- The post graduate should start working on the thesis/Dissertation and should complete the at the end of second year.

Objectives for 3rd year

- Thesis should be submitted minimum of 6 months before the final MD examination
- Post-graduates should be able to anaesthetise under supervision cardiac, neuro, paediatric and all major cases.
- They should be able to anaesthetise all other elective and emergency cases independently and manage acute pain and make decisions and know how to organize mass casualty.

- **Simulation based training:**

Simulators should be used for the events of high importance but infrequent occurrence and where there may be high risks to the patients. The simulators can also be used for assessment purposes.

5. Teaching methodology

- Teaching should include seminars, journal clubs, symposia, tutorials, case discussions, and research presentations.
- Reviews and guest lectures should get priority for theoretical knowledge.
- Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning.

Didactic lectures are of least importance.

- Student should have hands-on training in performing various procedures (medical/surgical concerning his specialty) and ability to interpret various tests/investigations.
- Exposure to newer specialized diagnostic/therapeutic procedures concerning his/her subject should be given.
- A postgraduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

- Log books shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Department should encourage e-learning activities.

6. POSTINGS FOR ANAESTHESIOLOGY POST GRADUATE

The post graduate student should be exposed to the following areas of clinical anaesthesia practice:

1. Pre-anaesthesia clinic
2. Pain clinic
3. Recovery and Post anaesthesia Care Unit (PACU)
4. Intensive Care Units
5. Dialysis and transplant
6. All specialty theatres
7. Peripheral areas: Radiology, MRI, ECT and other interventional laboratories

First year : Basic skills and orientation to broad specialty departments

1. General surgery :	4 months
2. Orthopedics surgery	1 month
3. Pre assessment clinic	1 month
4. ENT	1month
5. Medicine /Toxicology ICU	1 month
6. PACU/Recovery room	1month
7. Causality / Trauma	1month
8. Obstetric & Gynecology:	1 month
9. Pain Management	1 month

2nd year multi specialty training

1. Paediatric surgery OT	1 month
2. Ophthalmic surgery	1 Month
3. Urology OT	1month
4. Surgical gastroenterology	1month
5. Neuro surgery	1 month
6. Cardio thoracic surgery	1 month
7. RADIOLOGY SUITES [radiology & radiotherapy]	1 month
8. ICU/IRCU/PACU	1 month
9. OBG	1 month
10. Special postings for learning new advanced techniques / procedure / skills in specialized institutions or when the Institution does not have a fully functioning specialized dept	2 months

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

3rd year multi-specialty training

ENT & Faciomaxillary Surgery	1 month
Paediatric surgery	1 month
Neuro surgery	1 month
Plastic surgery	1 month
Cardio thoracic surgery	1 month
Transplant surgery OT	2 months
Vascular / Endocrine/ Geriatrics	1 month
Urology	1 month
Neonatology/ Cardiology Intensive Care	1 Month
Organ transplant OT & ICU	2 months

Emergency Operation Theatre & Day care surgery postings on rotation

7. Evaluation of the candidate

Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

METHODS OF FORMATIVE ASSESSMENT TO BE DONE

1. DIRECT OBSERVATIONAL PROCEDURAL SKILLS [DOPS]

The trainee performs a procedure and the assessor scores based on set criteria.

2. PROBLEM BASED LEARNING [PBL]

The trainee is given a problem faced during a their posting and the teacher sets the objective and then the students discuss based on the objectives .

3. Case or chart-based discussion

The trainee brings a number of anaesthetic records of cases that they have been involved in and the assessor picks one for discussion. The emphasis is upon the decision-making involved in the management of the case, rather than the depth of knowledge

4. CLINICAL EVALUATION EXERCISE [CEX]

The CEX tool looks at the trainee's performance in a case rather than focusing on a specific procedure, e.g. the anaesthetic management of a patient with renal failure.

5. TESTS

6. ACTIVITIES PARTICIPATION [SKILL TRAINING , CME , SEMINARS etc]

7. CRITICALLY REVIEW OF JOURNALS

8. PROGRESS IN THESIS.

9. LOG BOOK MAINTENANCE

COMPETENCY ASSESSMENT – twice a year in June & December
20 MARKS ADDED IN VIVA

Postgraduate Students Appraisal Form - Clinical Disciplines

Name of the Department:

ANAESTHESIOLOGY

Name of the PG Student :

Period of Training :

FROM.....TO.....

PARTICULARS	METHOD OF ASSESSMENT	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks: For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.
Marks		1 2 3	4 5 6	7 8 9	
Journal based / recent advances learning					
Patient based /Laboratory or Skill based learning	Direct Observation Procedural Skill [DOPS]				
Self directed learning and teaching	Problem Based Learning [PBL]				
Departmental and interdepartmental learning activity	CBD [Case Based Discussion] CEX [Clinical Evaluation Exercise]				
Written Test	1 test every 2 months				
External and Outreach Activities / CMEs					
Thesis / Research work					
Log Book Maintenance					

Publications Yes/ No.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

OVERALL marks for evaluation of the student :

1. Communication / commitment / Compassion towards patients	- 5 Marks
2. Formative Assessment [average of the total score]	- 5 marks
3. Number of Posters/Papers presented in Conferences/ Publications and Research Projects	- 5 marks
4. No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details.	- 5 marks
Total	20 Marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks	Marks
I year	Up to Dec	10 marks	Up to June	10 marks	20 Marks	
II year	Up to Dec	10 marks	Up to June	10 marks	20 Marks	
III year	Up to Oct	10 marks	Up to Feb	10 marks	20 Marks	
	AVERAGE				20 Marks	

8. Dissertation and University Journal of Medical Sciences:

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only

one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted **atleast 6 Months before the Theory and Clinical/Practical Examination.**

The periodical evaluation of dissertation/log book should be done by the guide / **HOD once in every six months.** The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

9.Examination

THEORY EXAMINATIONS:

Theory examination will comprise 4 papers.

Paper I: Basic Sciences as applied to Anaesthesiology

Paper II: Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases.

Paper III: Anaesthesia in relation to subspecialties/superspecialties

Paper IV: Intensive Care Medicine, Pain Medicine and Recent advances.

All the four question Papers will have following pattern

I. Elaborate on 2 x 15 = 30

II. Write note on 10 x 7 = 70

100 Marks

PG CLINICAL PRACTICAL EXAMINATIONS:- 300 MARKS

Clinical case		150 marks (70+40+40)
VIVA including Competency Assessment	-	80 Marks (60 + 20)
Ward rounds		25
OSCE		25
Log Book		20 marks

PRACTICAL EXAMINATIONS:-

Morning session

Total marks for morning session 150 marks (A)

Long case-1×70 Marks	Clinical case	70 marks
	40 minutes case examination and 20 minutes for discussion	
Short cases-2×40 Marks	10 minutes for each case examination and 20 minutes for each case discussion	80 marks

Afternoon session

Ward rounds / Case Scenario - 5 × 5 marks 5 mins each case discussion	25 marks (B)
OSCE 5 stations × 5 marks	25 marks (C)
VIVA - 15 mins for each station 4 stations	80 marks (D)
1. Anaesthesia machine including circuits and Vaporizers, ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.	15

2. Resuscitation equipments, resuscitation demonstration, Difficult Airway, Equipment, monitoring equipments.	15
3. Anaesthetic Drugs, Emergency Drugs, IV Fluids, Nerve Blocks (skeleton) .	15
4. Investigation :ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card	15
5. COMPETENCY ASSESSMENT	20
Log book	20 marks (E)
Aggregate Total (Clinical + Viva)	300
Minimum required marks for pass (50%)	(A+B+C+D+E)
	150
Thesis	Approved/Not approved

11. Log book

- A detailed log book should be maintained for the entire duration of the course. It should contain the following details.
- Procedures performed [total cases / procedures done, Detailed pre ,intra and post operative notes for 10 cases / procedures per posting done based on the cognitive ,psychomotor and affective domains of learning]
- Journal clubs/Clinical Meetings
- Seminars/CME/Conferences
- Important cases discussed/presented
- The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.
- Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months
- Since Anaesthesia postgraduates are posted to different specialties and intensive care areas the depts should create separate log books for each specialty giving special importance to important learning objectives_during that posting instead of having the same log book for all posting. This will meet the "SUBJECT SPECIFIC LEARNING OBJECTIVES"of NMC.

VIVA including Competency Assessment :

VIVA including Competency Assessment - 80 Marks (60 + 20)

- Anaesthesia Machine, Gas cylinders, Equipments, Monitors
- Drugs, IV fluids, Instruments, Procedure Tray
- Investigation Charts, ECG, Xray, ABG, Capnograph, Ventilator Graphics, etc..
- Resuscitation mannequin, Difficult airway mannequin, Defibrillator , Ventilator

14. OSCE

Five stations – Five minutes each station

5X5 =25 marks ©

1. Equipments, monitors, circuits, Vaporiser
2. Flow volume loops/ABG/ Capnographs/ Ventilator graphs /
3. Physiology, History relevant to Anaesthesiology
4. Drug Pharmacology, invasive procedure, Nerve block
5. Communication skill assessment- high risk informed consent, Cancellation/ consent for tracheostomy due to difficult intubation, Delayed recovery, Breaking bad news,etc.

15. REFERENCE BOOKS

S.No.	Name of the book	Author
1.	A synopsis of Anaesthesia	J. Alfred Lee
2.	Management of pain	J.J Bonica
3.	Anaesthesia for infants and children	R.M Smith
4.	A Practice of Anaesthesia	Wylic and Churchill Davidson
5	Anaesthesia - Vol.I and II	Miller
6	Clinical Anaesthesia	Barash
7.	Critical Care	Joseph Civetta
8	Anaesthesia and neurosurgery	Cottrell and Smith

9	Cardiac anaesthesia	Kaplan
10	Paediatric anaesthesia	Gregory
11	Pharmacology & Physiology in Anaesthetic practice	Robert K. Stoleting
12	Anaesthesia for Co-existing diseases	Robert K. Stoleting
13	Understanding Anaesthesia Equipment	Dorsch and Dorsch

**** Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

16. JOURNALS

1. Anaesthesiology
2. Anesthesia Analgesia
3. Anaesthesia
4. Anesthesia Intensive Care
5. Canadian Journal of Anaesthesia
6. British Journal of Anaesthesia
7. Indian Journal of Anaesthesia
8. Indian Journal of Anaesthesiology Clinical Pharmacology


 DEAN
 TAGORE MEDICAL COLLEGE & HOSPITAL
 RATHINAMANGALAM, MELAKOTTAIYUR POST,
 CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY
No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

M.D. / M.S.

POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM

2021 - 2022

M.S. OTORHINOLARYNGOLOGY


DEAN
TAGORE MEDICAL COLLEGE & HOSPITAL
RATHINAMANGALAM, MELAKOTTAIYUR POST,
CHENNAI-600 127.

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

M.S.OTORHINOLARYNGOLOGY

OTORHINOLARYNGOLOGY has undergone a major transformation in the past decade. the branch of surgery which initially comprised ENT head and neck surgery has acquired a totally new field in skull base surgery. There have been many advances in endoscopic surgery of the head and neck also. In tune with the continuing changes and the need for the students to update to the emerging new fields in otorhinolaryngology, the curriculum has been devised to acquire the new status

1 GOAL

The aim of this curriculum is to create a cadre of medical professionals who are well groomed to meet the challenges in the frontier of newer techniques and treatment in the emerging world of medicine and surgery.

1. This curriculum aims at students to keep abreast with latest in ENT subjects
2. Provide comprehensive diagnostic and therapeutic and surgical options and preventive ENT even in rural areas
3. Carry out research activities in emerging fields of ENT
4. To be a complete ENT surgeon by preventing ,diagnosing and treating ENT disease in the community and implement various health care programmes for the society
5. to standardize Otorhinolaryngology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating competent ENT Surgeons with appropriate expertise.

2 OBJECTIVES:

❖ Knowledge

The post graduate students have to acquire the knowledge of anatomy physiology and pathological changes in ENT diseases and , identify the manifestations due to diseases and plan the management and care of the patients.

❖ Attitude

Through the training program the student should develop a positive attitude and empathy towards the patient.

❖ Skills

The student should develop skills of comprehending ENT diseases in the society and know their pathophysiology and devise intervention both medically and surgically and also to prevent diseases. They are also required to have good communication skills and treat patient with empathy. In this perspective they are to acquire sufficient knowledge of theoretical practical research avenues for implementing preventive programmes in the society

The student should learn the basic methodology of teaching and assessment and develop competence in teaching medical/paramedical students and their assessment.

3 COMPONENT S OF THE POSTGRADUATE CURRICULUM

• THEORETICAL KNOWLEDGE

- a)** Basic sciences: it is required of student to acquire knowledge of anatomy physiology and mechanism of disease progression
- b)** Clinical ENT :knowledge of various ENT diseases and their related systemic connections should be studied

- c) Diagnostic procedures: knowledge of the various methods to identify and conclude regarding ENT diseases should be well studied
- d) Practical cadaveric and surgical skills should be obtained by constant practice and their skills should be evaluated
- e) Research activities should be learnt in such a way that they study the ENT illness both perspective and elaborately.
- f) Preventive ENT should be learnt with emphasis on hearing and anticancer studies

PRACTICAL AND CLINICAL SKILLS

❖ PRACTICAL SKILLS DIAGNOSTIC PROCEDURES

1. cadaver FESS dissection
2. temporal bone dissection
3. larynx dissection
4. neck dissection

❖ THERAPEUTIC PROCEDURES

- 1) Tracheostomy
- 2) Nasogastric tube insertion
- 3) Grommet insertion
- 4) Nasal packing
- 5) Antral lavage

❖ CLINICAL SKILLS

1. History taking and physical Examination
2. Functional assessment of hearing equilibrium, voice, smell, taste, airway for OSAS
3. Reading Audiogram, OAE, BERA, HIT assessment, speech assessment, rhinomanometry, smell and taste assessment, radiology of ENT
4. Radiotherapy techniques
5. Chemotherapy techniques

WRITING THESIS/ RESEARCH ARTICLES

All students will have to carry out a research program and bring out a dissertation (thesis)

Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International conferences.

ATTITUDES INCLUDING COMMUNICATION SKILLS

Student should develop the art of eliciting the maximum information from patients in a given time considering the sensory deficits of the patient and caregivers. Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with patients. They have to learn to show sensitivity to their special needs.

TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS BIO ETHICS AND MEDICOLEGAL ASPECTS

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, moral and legal issues, Medical audit are part and parcel of the curriculum and syllabus

4. THEORY SYLLABUS

Applied Basic Sciences SYLLABUS

Anatomy, Physiology, Biochemistry, Pathology and Bacteriology related to
E.N.T. Speciality:

Anatomy:

- Pre-natal and Post-natal development of the ear: Internal ear
Fistula ante fenestrum
Air spaces and lining membrane The Ossicles
Stapes External Ear
Pneumatisation of the Mastoid Process
- Anatomy of temporal bone:
 - Squamous
portion
 - Mastoid
portion
 - Petrous
portion
 - Tympanic
portion
- Anatomy of the ear:
 - External ear
 - Middle ear
 - Internal ear
- Anatomy of cranial nerves:
 - with particular reference to facial and auditory nerves
- Osteology of the cranial bones:
 - Venous sinuses
 - The brain

Anatomy of nose and paranasal sinuses:

Prenatal and post – natal
 The external nose
 The nasal cavity
 The paranasal sinuses
 Nasal Mucous membrane
 Blood supply and nerve supply

Anatomy of the Pharynx and Nose:

Development
 The tonsils
 Functions

Anatomy of the larynx:

- Prenatal and postnatal development of the larynx Difference between child and adult larynx Muscles and cartilages of larynx
 - Anatomy of trachea, bronchi and Oesophagus
 - The long and Broncho-pulmonary segments
 - The Mediastinum
 - The visceral arches, their derivatives developmental defects
- Development of face

Bacteriology Syllabus

1. Elementary Bacteriology pertaining to:
 - *Corynebacterium diphtheriae*
 - Staphylo, Strepto, Pneumo, Pseudomonas, H.influenza
 - Neisseria group
 - Proteus group
 - Vincents and Fusiform Bacillus
2. Fungus: Aspergillus group Mucor, Rhizopus
3. Viruses: Adeno virus, Coxsackie, RSV, E B Virus, HIV, H1N1 virus
4. Rhinosporidiosis

5. Immunology – Surgical Immunology & allergy

6. Biochemistry syllabus:

- Biochemistry of body fluids and C.S.F
- Electrolyte balance and maintenance of PH of Blood
- Biochemical changes in upper airway obstruction and after tracheostomy.
- Biochemistry of labyrinthine fluids and its variations in diseases.

7. Pharmacology syllabus:

- Pharmacology of sympathomimetic and their uses in Otolaryngology
- Local anaesthetics and analgesics : Merits and Demerits
- Chemotherapy of malignant conditions
- Cortico Steroids and its usage in Otolaryngology
- Antibiotics – recent trends
- Topical steroids

8. Pathology Syllabus:

- General Pathology – Inflammations, Necrosis, Gangrene Repair of wounds.
- Shock – Pathology
- Granuloms including midline granulomas Thrombosis and Embolism
- Tumors – Aetiology, Classification, Pathology & Histopathology
- Fungal infections
- Bleeding Disorders

Special Pathology:

- Surgical pathology of Mouth, Jaw, Neck Salivary glands and Oesophagus.

9. Ear:

- Pathology of the external ear.
- Histopathology of the drum membrane
- Inflammations of the middle ear
- Inflammation of Mastoid
- Inflammation of the Petross
- Histopathology of the inner ear: Vestibular Schwannoma Tuberculosis of ear

- Chronic inflammatory changes in the temporal bone
- Neoplasms of the ear
- Radiographic Anatomy
- Neurological Aspects of vertigo
- Electronystagmography

10. Nose:

- Pathology of the Nose.
- Chronic specific infections of the Nose and accessory sinuses (Pre Nasal).
- Cysts and tumours of the nose and accessory sinuses.

11. Pharynx and Larynx:

- Oral and Pharyngeal pathology as manifestations of constitutional Diseases Pathology of the Nasopharynx larynx. Swellings of the neck.
- Clinical Pathology in its relationship to otolaryngology.

12. Physiology Syllabus:

- Regulation of water balance and composition of body fluids by the kidney. Coagulation of blood.
- Physiology of special senses:
 - Taste.
 - Smell.
 - Heat.
- Physiology of respiration including its mechanism and regulation. Physiology of Deglutition.
- Maintenance of balance of body.
- Physiology of nose and paranasal sinuses.
- Carriage of Oxygen by the blood.
- Carbondioxide transport in the body.

13. Audiology syllabus:

- Physiology of hearing and balance:
- Hearing including physics of sound. Sound production.
- Physics of sound. The vibration. The decibel.
- Sound Stimuli and its Wave motion in a material medium.
- Propagation. Complex sound various and phase difference.
- Sound conduction.

- Vestibular function and balance. Semicircular canals.
- The otolith organs. Otoacoustic Emissions

Neurology:

1. Cranial nerves
2. Intra Cranial tension
3. Intra-Cranial hemorrhage
4. Pituitary Gland- Anatomy,Physiology, Hypo &Hyper pituatarism and new growth
5. Head injury
6. Intracranial Venous System
7. Osteology of Skull Bones, Cervical, Thoracic vertebrae, mandible and Sternum
8. Large Blood vessels in cervical region and thoracic duct Development and thoracic blood vessels

Head & Neck

1. Diseases of Salivary Gland
2. Skull base Surgery/neurological Surgery
3. Cervical Node Dissection
4. Anatomy and physiology of Thyroid Gland, Goiter, Diseases of Thyroid and Carcinoma of thyroid
5. Head and Neck reconstructive Surgery

Throat

1. Intubation of larynx
2. Thyroplasty

Plastic Surgery

1. Cosmetic Surgery of Nose
2. Facial Plastic Surgery
3. Skin Grafts and flaps

Anesthesia of ENT

Use of teaching Aids

Preparation of Slides

NEWER ADVANCES :

- 1) ENDOSCOPIC ANATOMY AND SURGURY OF SKULL BASE
- 2) COCHLEAR IMPLANT REHABILITATION
- 3) SIALENDOSCOPY

5. TEACHING LEARNING METHODS

The following teaching learning methods are recommended.

Lectures
 Case based discussion
 Bed side clinics
 Teaching on ward rounds
 Symposia
 Seminars
 Journal clubs
 Problem based learning
 Telemedicine

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge.

Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations, Hands on Training in various tests>procedures and ability to interpret various tests and procedures should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning.

Practical Skills

Cadaver Dissection of Ear, Nose and Larynx
Diagnostic Endoscopy
Microscopic Examination
Surgical Techniques

6. STRUCTURED TRAINING PROGRAM

ENT Postings Should include

1. in-patients,
2. out-patients,
3. ICU,
4. trauma,
5. emergency room,

Specialty clinics including

1. Vertigo Clinic,
2. Rhinology Clinic,
3. Otology Clinic,
4. Cancer Clinic,
5. Cadaveric dissection Lab,
6. Audiology and speech therapy.

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

FIRST YEAR:

E.N.T.	 7 Months
General Surgery	 2 Weeks
Anaesthesia	 2 Weeks
Plastic Surgery	 2 Weeks
Cardio Thoracic Surgery / Pulmonary Medicine	 2 Weeks
Neuro Surgery	 2 Weeks
Oral * Facio Maxillary Surgery	 2 Weeks
Surgical oncology	 2 Weeks
Radiotherapy	 2 Weeks
Chemotherapy	 2 Weeks
Radiology	 2 Weeks

Total -----
12 Months

SECOND YEAR:

Audiology and Neurotology	 1 Month
Paediatric Otolaryngology	 1 Month
ENT	10 months

Total	12 Months

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

Clinical meetings: There should be intra- and inter- departmental meetings for discussing the uncommon /interesting cases involving multiple departments.

Each student must be asked to present a specified number of cases for clinical discussion should be entered in a Log Book.
Should present one Research paper which should be published/accepted for publication during the postgraduate period

Patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

8. COMPETENCY ASSESSMENT:

- **OVERALL:**
 - a) Communication / commitment / Contribution / Compassion towards patients and Innovation () - 5 Marks
 - b) Implementation of newly learnt techniques/skills ()
 - Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks
 - Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks
 - No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks
- Total 20 Marks

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				

4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks* _____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

PG CLINICAL COURSE

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

10. THEORY EXAMINATION

Theory shall consist of four papers of 3 hours each.

Paper I: Basic Sciences related Otolaryngology

Paper II: Principles and Practices of Otolaryngology

Paper III: Recent advances in Otolaryngology and Head Neck surgery.

Paper IV: General Surgical Principles and Head-Neck Surgery.

Question paper Pattern:

Paper I :	Write notes on	
i.	Anatomy	4 x 5 = 20
ii.	Physiology	4 x 5 = 20
iii.	Biochemistry	3 x 5 = 15
iv.	Pharmacology	3 x 5 = 15
v.	Pathology	3 x 5 = 15
vi.	Microbiology	3 x 5 = 15
	Total =	100 marks

Paper II, III & IV :		
i.	Elaborate on :	2 x 15 = 30
ii.	Write notes on	10 x 7 = 70

Total = 100 marks

11. CLINICAL EXAMINATION

LONG CASE - (1 X 80 MARKS)	80 MARKS
SHORT CASE - (2 X 35 MARKS EACH)	70 MARKS
WARD ROUNDS (5 CASES X 5MARKS EACH)	25 MARKS
OSCE (5 STATIONS X 5 MARKS EACH)	25 MARKS
TOTAL	200 MARKS (A)
VIVA VOCE	80 MARKS (B)
LOG BOOK	20 MARKS (C)
AGGREGATE (CLINICAL + VIVA) TOTAL	300 MARKS (A+B+C)
MINIMUM REQUIRED FOR PASS (50%)	150 MARKS
DISSERTATION	APPROVED / NOT APPROVED

12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

13. VIVA; VIVA including Competency Assessment- 80 Marks (60 + 20) Unstructured Viva

14.OSCE (Objective Structural Clinical Examination)

Based on Objective Structured Exam Stations:

S.No.	Stations	Marks
1.	Pathology	05
2.	Microbiology	05
3.	Specimen – Dry – 5	05
4.	Speciment – Wet – 5	05
5.	Operative Surgery	05
6.	Instruments – 5	05
7.	X-ray – 5 / Laptop video	05
8.	CT/MRI – 5	05
9.	Audiogram	05
10.	Recent advances in ent (BERA/OAE/VEMP/CHAMP/IMPEDENCE)	05
		----- 50 -----

15. RECOMMENDED LIST OF TEXT BOOKS AND JOURNALS

1. Scott Brown's Otolaryngology – Five Volumes
2. Endoscopic sinus surgery by PJ Womald / MV Kirtane
3. Ballenger – Diseases of the Nose, Throat, Ear, Head and Neck
4. Mawson's Diseases of the Ear.
5. Glasscock and Shambaugh – Surgery of the Ear.
6. Learning Ear Surgery by Temporal Bone Dissection by Dr. K.K. Ramalingam and Dr. B. Sreeramoorthy
7. Year Book of Otolaryngolgy, Head and Neck Surgery Edited by Michael M. Paperella and Byron J. Bailey.
8. Tumours of the Head and Neck – Clinical and Pathological Considerations by John. G. Batsakis.
9. Rob and Smith – Operartive Surgery – Three volumesRecent Advances in Otolaryngology.
10. Jacksons Textbook of Broncho – Oesophagology
11. Radiology of Head and Neck by Valvassori

- 12. Diseases of the final nerve by Mark May**
- 13. Otology Neurology by D. Brachmann**
- 14. *Handbook of Clinical Audiology* by Jack Katz**
- 15. Stell & Maran's *Textbook of Head and Neck Surgery and Oncology***
- 16. *Essentials of Functional Sinus Surgery* by Heinz Stammberger MD**
- 17. *Color Atlas of Head & Neck Surgery* by Jatin P Shah**
- 18. Cummings *Otolaryngology - Head and Neck Surgery***

**** Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

REFERENCES:

Lore's Atlas or Head and Neck Surgery

Microsurgery of the skull base by Ugo Fisch and Douglas Matto.

Text Book of Operative Surgery by Lee.

16. JOURNALS

- 1. Indian Journal of Otolaryngology**
- 2. Journal of Otology**
- 3. Laryngoscope**
- 4. Otolaryngology Clinics of North American**
- 5. Annals of Otology, Rhinology and Laryngology**
- 6. Acta Otolaryngologica**
- 7. Archives of Otolaryngology, Head and Neck Surgery**
- 8. International Journal of Paediatric Otolaryngology**
- 9. otolaryngology clinics of North America**

(03-05 international Journals and 02 national (all indexed) journals)


 DEAN
 TAGORE MEDICAL COLLEGE & HOSPITAL
 RATHINAMANGALAM, MELAKOTTAIYUR POST,
 CHENNAI-600 127.

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN RADIOLOGICAL SCIENCES

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The Goal of this program is to impart training in conventional and modern radiology and imaging techniques so that the post graduate student becomes well versed and competent to practice, teach and conduct research in the discipline of radiology. The student should also acquire basic knowledge in the various sub-specialties of radiology. These Guidelines also would also help to standardize Radiodiagnosis teaching at post graduate diploma (DMRD) level throughout the country so that it will benefit in achieving competent radiologist with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SPECIFIC LEARNING OBJECTIVES

The objective of the program is to train a student to become a skilled and competent radiologist to conduct and interpret various diagnostic/interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging/intervention.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

A post graduate student on completing MD (Radiodiagnosis) should acquire knowledge in the following areas, and be able to:

1. Acquire good basic knowledge in the various sub-specialties of radiology such as chest radiology, neuro-radiology, GI-radiology, uro-radiology, cardio-vascular-radiology, musculoskeletal, interventional radiology, emergency radiology, pediatric radiology and women's imaging.

2. Independently conduct and interpret all routine and special radiologic and imaging investigations.
3. provide radiological services in acute emergency and trauma including its medico-legal aspects.
4. Elicit indications, diagnostic features and limitation of applications of ultrasonography, CT and MRI and should be able to describe proper cost-effective algorithm of various imaging techniques in a given problem setting.
5. Decide on the various image-guided interventional procedures to be done for diagnosis and therapeutic management.
6. Able to decide on further specialization to be undertaken in any of the branches in Radiodiagnosis such as gastrointestinal radiology, uro-radiology, neuro-radiology, vascular radiology, musculoskeletal radiology, interventional radiology etc.
7. Able to formulate basic research protocols and carry out research in the field of radiology- related clinical problems.
8. Acquire knowledge and teaching capabilities to work as a post graduate student /consultant in Radiodiagnosis and conduct teaching programmes for undergraduates, post graduates as well as paramedical and technical personnel.
9. interact with other specialists and super-specialists so that maximum benefit accrues to the patient.
10. Should be able to organize CME activities in the specialty utilizing modern methods of teaching and evaluation.
11. Acquire knowledge to impart training in both conventional radiology and modern imaging techniques so that the post graduate student is fully competent to practice, teach and do research in the broad discipline of radiology including ultrasound, Computed Tomography and Magnetic Resonance Imaging.
12. Acquire knowledge of interventional radiology.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

Practical Training will include two major aspects:

- A) Interpretation of images, and
- B) Skill in performing a procedure.

A) Interpretation of images:

The student should be able to interpret images on all imaging modalities of diseases of following organs :

1. **Musculo-skeletal System** - Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, endocrine and metabolic, neoplastic and miscellaneous conditions.
2. **Respiratory System** - Interpretation of diseases of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.
3. **Cardiovascular System** - Interpretation of diseases and disorders of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, Angiography and Isotopes Studies.
4. **Gastro-intestinal tract and hepato-biliary pancreatic system** - Interpretation of diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma. Diseases and disorders of liver, biliary system and pancreas.
5. **Urogenital System** - Interpretation of various diseases and disorders of genitor-urinary system. These include: congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous conditions.
6. **Central Nervous System (C.N.S.)** - Interpretation of diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic and miscellaneous condition.
7. Imaging in Emergency Medicine.
8. Imaging in Obstetrics and Gynecology.
9. Imaging of Breast and interventional procedures.
11. ENT, EYE and Dental Imaging.
11. Imaging of endocrine glands and those involved with metabolic diseases.
12. Clinical applied radionuclide imaging.
13. Interventional Radiology

B) Skills in performing a procedure

The student should be able to perform the following procedures:

- 1) **GIT contrast studies:** Barium studies (swallow, upper GI, Follow through, enema);

- fistulogram; sialogram; cologram/ileostogram,
- 2) **GU:** Excretory urography, MCU, RGU, nephrostogram, genitogram,
 - 3) **Ultrasound:** Studies of whole body including neonatal transfontanell studies, Doppler studies,
 - 4) **CT scan:** should be able to position a patient, plan study as per the clinical indication, do reconstruction of images, perform triple phase study, perform & interpret advanced applications like CT enterography, CT angiography etc.
 - 5) **MRI:** plan and perform MRI studies of whole body
 - 6) **DSA:** should be able to describe the techniques, do (if available to student) transfemoral puncture and insert catheter, help in angiographic procedures both diagnostic and interventional.
 - 7) **Radiography:** should be able to independently do radiography of common and some important uncommon views of different body parts. This includes positioning, centering of X ray beam, setting of exposure parameters, exposing and developing the films. The student should be familiar with not only conventional radiography but with CR and DR systems.
 - 8) **Interventional radiology:** The student should be able to perform simple, common non- vascular procedures under ultrasound and fluoroscopy guidance e.g. abscess drainage, drainage catheter placement, nephrostomy, biliary drainage etc. The student should have knowledge of common vascular interventions e.g stricture dilatation using balloon catheters, embolization with gel foam and other agents, names of common catheters, handling of intravenous contrast reactions; techniques, indications and contraindications for various procedures;

Syllabus

Course contents:

Anatomy

Gross and cross sectional anatomy of all the body systems.

Pathology

Gross morphology of pathological conditions of systemic diseases affecting all organ systems.

Radiology Course

This would cover imaging and interventions of diseases affecting all the body systems:

- Chest
- Cardiovascular system
- Musculoskeletal including soft tissue
- Gastrointestinal system
- Hepato-biliary-pancreatic system
- Urogenital (genito-urinary) system

- CNS including head and neck
- Obstetrics and gynaecology
- ENT, eye, dental, breast
- Endocrine and metabolic system
- Clinically applied radionuclide imaging

Radiological Physics

1. Introduction of general properties of radiation and matter: Fundamentals of nuclear physics and radioactivity
2. Interaction of x-rays and gamma rays with matter and their effects on irradiated materials
3. X-ray Generating Apparatus
4. Screen-film radiography
5. Film processing: Dark room, dry processing, laser /dry chemistry cameras, artifacts.
6. Fluoroscopy: Digital including flat panel units, fluoroscopy cum radiography units
7. Digital radiography: Computed Radiography, Flat panel radiography
8. Other equipments: Ultrasound including Doppler, CT, MRI and DSA
9. Contrast Media (Iodinated, MR & Ultrasound) - types, chemical composition, mechanism of action, dose schedule, route of administration, adverse reaction and their management
10. Nuclear Medicine: Equipments and isotopes in various organ systems and recent advances
11. Picture Archiving and Communication System (PACS) and Radiology Information System (RIS) to make a film-less department and for Teleradiology
12. Radiation protection, dosimetry and radiation biology
13. Image quality and Quality Assurance (QA)
14. Recent advances in radiology and imaging

The student should have knowledge of the following physics experiments:

- Check accuracy of kVp and timer of an X ray unit
- Check accuracy of congruence of optical radiation field
- Check perpendicularity of x ray beam
- Determine focal spot size
- Check linearity of timer of x ray unit
- Check linearity of mA
- Verification of inverse square law for radiation
- Check film screen contact
- Check film screen resolution
- Determine total filtration of an x ray unit
- Processor quality assurance test

- Radiological protection survey of an x ray unit
- Check compatibility of safe light
- Check performance of view box
- Effect of kVp on x ray output

Radiography and processing techniques

1. Processing techniques: includes dark room and dry processing.
2. Radiography of the musculo-skeletal system including extremities.
3. Radiography of the chest, spine, abdomen and pelvic girdle.
4. Radiography of the skull, orbit, sinuses.
5. Contrast techniques and interpretation of GI tract, hepato-biliary tract, pancreas etc.
6. Contrast techniques and interpretation of the Central Nervous system.
7. Contrast techniques and interpretation of the cardiovascular system including chest.
8. Contrast techniques and interpretation of the genito - urinary system including Obstetrics and Gynaecology.
9. Paediatric radiology including MCU, genitogram, bone age.
10. Dental, portable and emergency (casualty) radiography.

TEACHING AND LEARNING METHODS

The training is spread over 3 years and includes following components:

1. Physics related to imaging
2. Rotational posting in various sub-specialties.
3. Seminars, case discussion, journal club.
4. Research methodology and statistics.
5. A log book should be maintained by the student and will be checked and signed regularly by the faculty-in-charge during the training program.
6. The postgraduate students shall be required to participate in the teaching and training program of undergraduate students and interns.
7. The postgraduate student would be required to present one poster presentation, to read one paper at a national/state conference and to submit one research paper which should be published or accepted for publication or sent for publication to a peer reviewed journal, during the period of his/her postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.
7. Department should encourage e-learning activities.

Rotations:

During the three-year course, suggested rotations are as follows:-

1. Conventional chest, abdomen, musculoskeletal including skull, spine, PNS and mammography etc 8 months
2. Contrast studies: G.U., GIT, Hepato-biliary, angiography etc including fluoroscopic guided interventions 8 months
3. US, Doppler and US guided interventions 8 Months
4. CT and CT guided interventions 6 Months
5. Emergency radiology 2 Months
6. M.R.I. 2 Month
7. Elective posting 2 Months

During each posting, post graduate student should be able to perform the procedures and interpret the findings.

PROPOSED SCHEDULE FOR ROTATION

1 ST Year (1/6)	Conventional Chest & abdomen	Conventional skull, spine, musculo-skeletal etc.	US	Contrast studies - GIT & other fluoroscopic investigations	Contrast studies - G.U. tract	US
	US & interventions	Conventional skull, spine, musculo-skeletal etc.	CT	Contrast studies -- GIT & other fluoroscopic investigations	Contrast studies - G.U. tract	US & interventions
2 nd Year (3/6)	Conventional Chest & abdomen	Contrast studies - GIT & other fluoroscopic investigations including angiography	Contrast studies - G.U. tract	US & interventions	Emergency	CT
	Conventional skull, spine, musculo-skeletal etc.	Contrast studies - G.U. tract including pediatric MCU/genitogram	US & interventions	US & Doppler	Emergency	MRI
3 rd year (5/6)	Conventional Chest & mammo-graphy	Contrast studies - GIT & other fluoroscopic investigations including angiography	US & Doppler	Emergency	CT & interventions	Elective
(6/6)	Conventional musculo-skeletal & mammo-graphy	Contrast studies - G.U. tract including pediatric MCU/genitogram	CT& interventions	CT & interventions	MRI	Elective

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination.

Quarterly assessment during the MD training should be based on:

- 1. Journal based / recent advances learning**
- 2. Patient based /Laboratory or Skill based learning**
- 3. Self directed learning and teaching**
- 4. Departmental and interdepartmental learning activity**
- 5. External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

Postgraduate Examination

The Post Graduate Examination was conducted in three parts.

1. Thesis:

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis (Dissertation). Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical /

Practical examination. The thesis shall be examined by a minimum of two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers:

Paper I: Basic sciences related to Radiology (consists of Anatomy, Pathology, Basic and Radiation Physics, Imaging Techniques, and Film processing).

Paper II: Chest, CVS, CNS including Head & Neck, Eye, ENT, musculo-skeletal, pediatric radiology and Mammography.

Paper III: Abdominal Imaging including GI, GU, Hepatobiliary, endocrine and metabolic, Obstetrics and Gynaecology and Interventional radiology

Paper IV: Recent advances, nuclear medicine; Radiology related to clinical specialties

All papers would consist of short answer questions (minimum 10) covering all aspects of the course.

3. Practical/clinical and oral Examination (will include cases, spots, ultrasound procedure, physics, implements etc)

Practical Examination will have:

1. 3-4 Cases
2. Film Quiz (50 – 60 Spots)
3. To perform Ultrasound on a patient

Oral/Viva voce will include:

- Radiation Physics and quality assurance
- Implements, Catheters and contrast
- Cassettes, films, dark room, equipment
- Radiographic techniques, Radiological procedures,
- Gross pathology

Suggested Reading:

Books (latest edition)

1. Grainger & Allison's Text book of Diagnostic Radiology (Churchill Livingstone)
2. Textbook of Gastrointestinal Radiology- Gore and Levine (Saunders)
3. MRI of Brain and Spine - Scott Atlas (LWW)
4. Diagnosis of Diseases of the Chest -Fraser
5. Diagnostic Imaging Series: (Amirsys, Elsevier)
Abdominal Imaging, Orthopedics, Head and Neck, Neuroradiology, Pediatric Radiology Chest, Obstetrics, Breast
6. MRI in Orthopedics and Sport Injuries - Stoller
7. Skeletal Radiology - Greenspan
8. Abdominal-Pelvic MRI - Semelka (IWW)
9. Caffey's Pediatric Radiology
10. CTI and MRI of the whole body- John R. Haaga
11. Text Book of Radiology and imaging - Davod sulton
12. Diagnostic ultrasound - Carol C. Rumack
13. AIIMS-MAMC-PGI's Comprehensive Textbook of Diagnostic Radiology, Volumes 1, 2, 3

Journals

03-05 international Journals and 02 national (all indexed) journals

1. ~~American Journal of Roentgenology~~
2. ~~Radiology~~
3. ~~Seminars in Ultrasound, CT, MRI~~
4. ~~Radiographics~~
5. ~~Clinical Radiology~~
6. ~~British Journal of Radiology~~
7. ~~Radiological Clinics of North America~~
8. ~~Pediatric Radiology~~
9. ~~Australasian Radiology~~
10. ~~Journal of Computerized Axial Tomography~~
11. ~~Clinical Imaging~~
12. ~~MR Clinics of North America~~
13. ~~Seminars in Roentgenology~~



Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications

Yes/ No

Remarks*

***REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD


DEAN
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