



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

(A Deemed to be University Declared under Section 3 of UGC Act, 1956)

Comprising Sri DevarajUrs Medical College

[Constituent Unit of Sri DevarajUrs Educational Trust for Backward Classes (Regd.)]

TAMAKA, KOLAR-563103, KARNATAKA, INDIA

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(With effect from 2019-2020 batches)

Competency Based Medical Education (CBME)

Curriculum for MBBS

Phase-I


Dean Faculty Of Medicine
Sri Devaraj Urs Academy of Higher
Education & Research, Tamaka, Kolar.

Approved as per BOM-56-2019, (Resolution No-LVI.06) Dated-20/12/2019

REGULATIONS GOVERNING

M.B.B.S. Degree Program (Phase-I Courses)

Competency Based Medical Education (CBME)
Curriculum

2019-20



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

COMPRISING SRI DEVARAJ URS MEDICAL COLLEGE

Declared under Section 3 of UGC Act, 1956,
MHRD GOI No.F.9-36/2006-U.3(A) Dt.25th May 2007
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POST BOX NO. 62, TAMAKA, KOLAR - 563 103, KARNATAKA, INDIA.

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VISION:

“UNIVERSITY OF EXCELLENCE - KNOWLEDGE FOR POSTERITY”

MISSION:

1. To be a global center of excellence for Teaching, Training and Research in the field of Higher education.
2. To inculcate scientific temper, research attitude and social accountability amongst faculty and students.
3. To promote with value based education for the overall personality development and leadership qualities to serve the humanity.

OBJECTIVES:

1. To provide need based infrastructure and facilities to students to become responsible professionals with social commitment and accountability.
2. To implement effectively innovative programs in teaching learning and evaluation.
3. To impart scientific and socio cultural temperament among students to forge national identity and needs.
4. To provide instruction and training in Basic and advanced branches of learning.
5. To provide facilities for research for the advancement and dissemination of knowledge.
6. To undertake extra mural studies, consultancy, extension programmes and field outreach services for the development of society.
7. To collaborate with other Universities, Institutions of excellence and research organizations within the country and outside for the purpose of teaching, training and research.
8. To undertake need based activities for the betterment of socially and educationally backward society.



At a glance this logo is abstract, yet it contains the vital ingredients for an institution like Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.

The institution's medical background, Humanitarian values, Compassion, Approachability, Social Commitment and the subsequent research towards the most precious thing, the human life, is the core theme.

The graphic form of a person in the centre of a bud represents the humanity. It denotes the growing process of life and its existence. And the two hands safeguarding them show the care and a sense of security. It is also capable of holding something within the vast expanse of knowledge by the University for the People's benefit. Hence, the motto "Knowledge for Posterity" is very appropriate and gives a punch in Red. The four light blue half circles (smaller to bigger) depict the unending quest for knowledge and imparting it to a wider horizon, growing higher and higher.

COLORS USED:

Deep Blue: Credible, Confident and Dependable. Represents Peace, Tranquility, Stability, Harmony, Trust, Security, Cleanliness and Loyalty

Light Blue: For Sky and Water (color scheme for 4 half circles)

Red: A dominant color for strengths.

Green: For Nature, Health and Generosity. It's cool quality soothes and has great Healing Powers. As Approved by the Board of Management of The Academy



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A-DEEMED-TO-BE-UNIVERSITY

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No: SDUAHER/KLR/ADMN/2363/ 2019-20

Date: 10th Dec. 2019

NOTIFICATION

Sub: Implementation of revised MBBS curriculum for Phase I MBBS Subjects-Reg.

- Ref:**
1. M.C.I. Regulations on Graduate Medical Education, 2018.
 2. Notification No.MCI-Academics/2019/128072 dt. 06.07.2019.
 3. Amendment Notification No. MCI-34(41)/2019-Med./161726 dt. 4th November 2019
 4. Proceedings of the 33rd Meeting of the Academic Council held on 14th June 2019.
 5. Proceeding of the 36th Meeting of the Academic Council held on 30th Sept. 2020.
 6. Proceedings of the 59th Meeting of the Board of Management held on 9th Oct. 2020.

The MCI has released the amended notification on Graduate Medical Education cited at above Reference. The Academy has prepared revised MBBS curriculum aligning with the MCI Curriculum. In accordance with the decision taken in the meeting of the Academic Council of The Academy cited under above reference, The Academy has decided to implement revised MBBS curriculum for Phased I MBBS Subjects from the academic year 2019-20.

Accordingly, The Academy hereby notifies the implementation of revised MBBS curriculum for Phase I MBBS Subjects from the academic year 2019-20 onwards.

**Sd/-
Registrar**

Sl. No.	Topics	Page No.
1	CHAPTER I General Considerations And Teaching Approach	06
2	CHAPTER II Phase Wise Training and Time Distribution For Professional Development	16
3	CHAPTER III Competency Based Curriculum of The Indian Medical Graduate Programme	30
4	ANATOMY	31
5	PHYSIOLOGY	68
6	BIOCHEMISTRY	88
7	COMMUNITY MEDICINE	111
8	ENVIRONMENTAL STUDIES	119
9	KANNADA	122

CHAPTER I

GENERAL CONSIDERATIONS AND TEACHING APPROACH

1. Indian Medical Graduate Training Programme

The undergraduate medical education programme 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 programme are hereby prescribed:-

1.1. 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 to fulfill his/her social obligations towards realization of this goal.
- b) Learn every aspect of National policies on health and devote her/him 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.

1.2. Institutional Goals

1. 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, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
 - c) appreciate rationale for different therapeutic modalities; be familiar with the administration of “essential medicines” and their common adverse 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 Programmes 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 levels of service delivery.
 - vii. Bio-medical waste disposal.
 - 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, hospital management, 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 such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.
 - l) 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.

1.3. Goals and Roles for the Learner

In order to fulfil the goal of the IMG training programme, the medical graduate must be able to function in the following roles appropriately and effectively:-

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

2. 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:

2.1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with Compassion.

- 2.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioural and social perspective.
- 2.1.2 Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.
- 2.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.
- 2.1.4 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.
- 2.1.5 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.
- 2.1.6 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.
- 2.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- 2.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- 2.1.9 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.
- 2.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frame works.

2.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

2.1.12 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.
- iv. Rehabilitation.

2.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that address eschronicity, mental and physical disability.

2.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

2.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.1. Leader and member of the health care team and system

3.1.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3.1.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.1.3 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. 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.

- 3.1.4 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- 3.1.5 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancers, in collaboration with other members of the health care team.

3.2. Communicator with patients, families, colleagues and community

- 3.2.1 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.
- 3.2.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- 3.2.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- 3.2.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

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

- 3.3.1 Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- 3.3.2 Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- 3.3.3 Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

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

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

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

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

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

3.4.3. Demonstrate ability to recognize and manage ethical and professional conflicts. Abide by prescribed ethical and legal codes of conduct and practice.

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

4. Broad Outline on training format

4.1. In order to ensure that training is in alignment with the goals and competencies listed in sub-clause 2 and 3 above:

4.1.1 There shall be a "Foundation Course" to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

4.1.2 The curricular contents shall be vertically and horizontally aligned and integrated to the maximum extent possible in order to enhance learner's interest and eliminate redundancy and overlap.

4.1.3 Teaching-learning methods shall be learner centric and shall predominantly include small group learning, interactive teaching methods and case based learning.

4.1.4 Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care-based learning experiences and emergencies.

4.1.5 Training shall primarily focus on preventive and community based approaches to health and disease, with specific emphasis on national health priorities such as family welfare, communicable and noncommunicable diseases including cancer, epidemics and disaster management.

4.1.6 Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.

4.1.7 The development of ethical values and overall professional growth as integral part of curriculum shall be emphasized through a structured longitudinal and dedicated programme on professional development including attitude, ethics and communication.

4.1.8 Progress of the medical learner shall be documented through structured periodic assessment that includes formative and summative assessments. Logs of skill-based training shall be also maintained.

4.2. Appropriate Faculty Development Programmes shall be conducted regularly by institutions to facilitate medical teachers at all levels to continuously update their professional and teaching skills, and align their teaching skills to curricular objectives.

Pandemic Management Module for Under Graduate August 2020 (Module 7)
Longitudinal Module on Management of Pandemics for MBBS course

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Foundation Course	F.1	History of Outbreaks, Epidemics & Pandemics	2	Pre-Clinical
Phase I	1.1	Infection Control: Part - I Infection Control Practices – Hand washing, Decontamination Use of PPEs	4	Microbiology
Phase II	2.1	Infection Control: Part II Air borne precautions Contact Precautions, Infection Control Committee	4	Microbiology
	2.2	Emerging and Re-emerging infections, early identification and control of new infections	6	Community Medicine
	2.3	Sample Collection, Microbial diagnosis, Serologic tests and their performance parameters	6	Microbiology
	2.4	Vaccination strategies including vaccine development & Implementation	6	Community Medicine, Biochemistry
	2.5	Therapeutic strategies including new drug development	6	Pharmacology, General Medicine
Phase III Part 1	3.1	Outbreak Management including Quarantine, Isolation, Contact Tracing	5	Community Medicine
	3.2	Interdisciplinary Collaboration, Principles of Public Health Administration, Health Economics, International Health	5	
	3.3	Operational Research, Field work, Surveillance	8	
Electives		Epidemiology and research Components		Community Medicine

Phase III Part 2	4.1	Care of patients during Pandemics	6	Clinical departments (General Medicine, Pulmonary Medicine, Anesthesiology as Integrated sessions)
	4.2	Emergency Procedures	8	
	4.3	Death related management	2	
	4.4	Communications and media management	4	
	4.5	Intensive Care Management during Pandemics	4	
	4.6	Palliative Care during Pandemics	4	
Total			80 hours	

Skills suggested

1. Infection Control related
 - Hand washing
 - PPE Donning & Doffing
 - Disinfection
2. Diagnostic
 - Sample collection
 - Sample transportation & storage
 - Choose the appropriate test based on performance parameters
3. Disease Management
 - Pharmaco-vigilance measures
 - Protocol based Management
 - Therapeutic decision-making
 - Terminal care including CPR, ALS, PALS
4. Epidemic Management
 - Outbreak investigation
 - Contact tracing, Quarantine and Isolation
 - Surveillance
 - Documentation
5. Research
 - Operational research
 - Clinical trial protocol preparation including Vaccine trials
 - Ethical considerations
6. Communication
 - To the media
 - Use of Telemedicine
 - Patient & stakeholder communication
7. Intensive Care
8. Palliative care during pandemics

CHAPTER II

PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

Provided that in respect of batches admitted prior to the academic year 2019-20, the governing provisions shall remain as contained in the Part I of these Regulations.

5. Training period and time distribution:

5.1 Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into nine semesters from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.

5.2 Each academic year will have at least 240 teaching days with a minimum of eight hours of working on each day including one hour as lunch break.

5.3 Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include problem oriented learning, case studies, community oriented learning, self- directed and experiential learning.

5.4 The period of 4 ½ years is divided as follows:

5.4.1 Pre-Clinical Phase [(Phase I) - First Professional phase of 13 months preceded by Foundation Course of one month]: will consist of preclinical subjects – Human Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module and early clinical exposure, ensuring both horizontal and vertical integration.

5.4.2 Para-clinical phase [(Phase II) - Second Professional (12 months)]: will consist of Para-clinical subjects namely Pathology, Pharmacology, Microbiology, Community

Medicine, Forensic Medicine and Toxicology, Professional development including Attitude, Ethics & Communication (AETCOM) module and introduction to clinical subjects ensuring both horizontal and vertical integration.

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the *primary level* of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- a) Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- b) Involvement in patient care as a team member,
- c) Involvement in patient management and performance of basic procedures.

5.4.3 Clinical Phase – [(Phase III) Third Professional (28 months)]

- a) Part I (13 months) - The clinical subjects include General Medicine, General Surgery, Obstetrics & Gynaecology, Pediatrics, Orthopaedics, Dermatology, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Psychiatry, Respiratory Medicine, Radiodiagnosis & Radiotherapy and Anaesthesiology & Professional development including AETCOM module.
- b) Electives (2 months) - To provide learners with opportunity for diverse learning experiences, to do research/community projects that will stimulate enquiry, self directed experimental learning and lateral thinking [9.3].
- c) Part II (13 months) - Clinical subjects include:
 - i. Medicine and allied specialties (General Medicine, Psychiatry, Dermatology Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis).
 - ii. Surgery and allied specialties (General Surgery, Orthopedics [including trauma]), Dentistry, Physical Medicine and rehabilitation, Anaesthesiology and Radiodiagnosis).
 - iii. Obstetrics and Gynecology (including Family Welfare).
 - iv. Pediatrics.
 - v. AETCOM module.

-
- 5.5 Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem oriented approach, case studies and community health care activities. The admission shall be made strictly in accordance with the statutory notified time schedule towards the same.
- 5.6 Universities shall organize admission timing and admission process in such a way that teaching in the first Professional year commences with induction through the Foundation Course by the 1st of August of each year.
- i. Supplementary examinations shall not be conducted later than 90 days from the date of declaration of the results of the main examination, so that the learners who pass can join the main batch for progression and the remainder would appear for the examination in the subsequent year
 - ii. A learner shall not be entitled to graduate later than ten (10) years of her/his joining the first MBBS course.
- 5.7 No more than four attempts shall be allowed for a candidate to pass the first Professional examination. The total period for successful completion of first Professional course shall not exceed four (4) years. Partial attendance of examination in any subject shall be counted as an attempt.
- 5.8 A learner, who fails in the second Professional examination, shall not be allowed to appear in third Professional Part I examination unless she/he passes all subjects of second Professional examination.
- 5.9 Passing in third Professional (Part I) examination is not compulsory before starting part II training; however, passing of third Professional (Part I) is compulsory for being eligible for third Professional (Part II) examination.
- 5.10 During para-clinical and clinical phases, including prescribed 2 months of electives, clinical postings of three hours duration daily as specified in Tables 5, 6, 7 and 8 would apply for various departments.

6. Phase distribution and timing of examination

- 6.1 Time distribution of the MBBS programme is given in Table 1.

6.2 Distribution of subjects by Professional Phase-wise is given in Table 2.

6.3 Minimum teaching hours prescribed in various disciplines are as under Tables 3-7.

6.4 Distribution of clinical postings is given in Table 8.

6.5 Duration of clinical postings will be:

6.6 Second Professional : 36 weeks of clinical posting (Three hours per day - five days per week : Total 540 hours)

6.7 Third Professional part I: 42 weeks of clinical posting (Three hours per day - six days per week : Total 756 hours)

6.8 Third Professional part II: 44 weeks of clinical posting (Three hours per day - six days per week : Total 792 hours)

6.9 Time allotted excludes time reserved for internal / University examinations, and vacation.

6.10 Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University. Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.

6.11 25% of allotted time of third Professional shall be utilized for integrated learning with pre- and para- clinical subjects. This will be included in the assessment of clinical subjects.

Table 1: Time distribution of MBBS Programme & Examination Schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Founda- tion Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS – Part - I									Exam III MBBS Part I	Electives & Skills	
Exam III MBBS Part II	Internship										
Internship											

- One month is provided at the end of every professional year for completion of examination and declaration of results.

Table 2: Distribution of subjects by Professional Phase

Phase & year of MBBS training	Subjects & New Teaching Elements	Duration#	University examination
First Professional MBBS	Foundation Course (1 Month) Human Anatomy, Physiology & Biochemistry, introduction to Community Medicine, Humanities Early Clinical Exposure, Attitude Ethics and Communication Module (AETCOM)	1+13 months	1 Professional
Second Professional MBBS	Pathology, Microbiology, Pharmacology, Forensic Medicine Clinical Postings Attitude, Ethics & Communication Module (AETCOM)	12 months	II Professional
Third Professional MBBS Part - I	General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Psychiatry, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Respiratory medicine, Radiodiagnosis & Radiotherapy, Anesthesiology Clinical subjects /postings Attitude, Ethics & Communication Module (AETCOM)	13 months	III Professional (Part I)
Electives	Electives, Skills and assessment*	2 months	
Third Professional MBBS Part II	General Medicine, Pediatrics, General Surgery, Orthopedics, Obstetrics and Gynecology including Family welfare and allied specialties Clinical postings/subjects Attitude, Ethics & Communication Module (AETCOM)	13 months	III Professional (Part II)

*Assessment of electives shall be included in Internal Assessment:

Table 3: Foundation Course (one month)

Subjects/ Contents	Teaching hours	Self-Directed Learning (hours)	Total hours	
Orientation ¹	30	0	30	
Skills Module ²	35	0	35	
Field visit of Community Health Centre	8	0	8	
Introduction of Professional Development & AERTCOM module		-	-	40
Sports and extracurricular activities		22	0	22
Enhancement of language / computer skills ³		40	0	40
		-	-	175

1. Orientation course will be completed as single block in the first week and will contain elements outlined in 9.1.
2. Skills modules will contain elements outlined in 9.1.
3. Based on perceived need of learners, one may choose language enhancement (English or local spoken or both) and computer skills. This should be provided longitudinally through the duration of the Foundation Course.

Teaching of Foundation Course will be organized by pre-clinical departments.

Module F

Longitudinal Module on Management of Pandemics for MBBS course

History of Outbreaks, Epidemics & Pandemics

The student should demonstrate the ability to:	Level
Define pandemic and differentiate it from outbreak/epidemic.	K
Identify the reasons and /or events that lead to pandemics in the past.	KH
Describe key strategies (by the State/Central Government, Non- Government Organization and society at large) that were adopted in prevention and control of these pandemics.	KH
Discuss the role which will be played by National and International bodies like WHO and ICMR, if these events take place	KH

Table 4: First Professional teaching hours

Subjects	Lectures (Hours)	Small group learning (Tutorials / Seminars)/ Integrated learning (hours)	Self - Directed Learning	Total (hours)
Human Anatomy	220	415	40	675
Physiology*	160	310	25	495
Biochemistry	80	150	20	250
Early Clinical Exposure**	90	-	0	90
Community Medicine	20	27	5	52
Attitude Ethics & Communication Module (AETCOM)***	-	26	8	34
Sports and extracurricular activities	-	-	-	60
Formative assessment and Term examinations	-	-	-	80
Total	-	-	-	1736

* Including Molecular Biology.

** Early clinical exposure hours to be divided equally in all three subjects.

*** AETCOM module shall be a longitudinal programme.

7. New teaching / learning elements

7.1. Foundation Course

7.1.1 Goal: The goal of the Foundation Course is to prepare a learner to study medicine effectively. It will be of one month duration after admission.

7.1.2 Objectives: The objectives are to:

(a) Orient the learner to:

- (i) The medical profession and the physician's role in society
- (ii) The MBBS programme
- (iii) Alternate health systems in the country and history of medicine
- (iv) Medical ethics, attitudes and professionalism
- (v) Health care system and its delivery
- (vi) National health programmes and policies
- (vii) Universal precautions and vaccinations
- (viii) Patient safety and biohazard safety
- (ix) Principles of primary care (general and community based care)
- (x) The academic ambience

(b) Enable the learner to acquire enhanced skills in:

- (i) Language
- (ii) Interpersonal relationships
- (iii) Communication
- (iv) Learning including self-directed learning
- (v) Time management
- (vi) Stress management
- (vii) Use of information technology

(c) Train the learner to provide:

- (i) First-aid
 - (ii) Basic life support
-

7.1.3 In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:

- (a) Local language programme.
- (b) English language programme.
- (c) Computer skills.
- (d) These may be done in the last two hours of the day for the duration of the Foundation Course.

7.1.4 These sessions must be as interactive as possible.

7.1.5 Sports (to be used through the Foundation Course as protected 04 hours /week).

7.1.6 Leisure and extracurricular activity (to be used through the Foundation Course as protected 02 hours per week).

7.1.7 Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

7.1.8 The time committed for the Foundation Course may not be used for any other curricular activity.

7.1.9 The Foundation Course will have compulsory 75% attendance. This will be certified by the Dean of the college.

7.1.10 The Foundation Course will be organized by the Coordinator appointed by the Dean of the college and will be under supervision of the heads of the preclinical departments.

7.1.11 Every college must arrange for a meeting with parents and their wards.

7.2. Early Clinical Exposure

7.2.1 Objectives: The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment,
 - b) Provide a context that will enhance basic science learning,
 - c) Relate to experience of patients as a motivation to learn,
 - d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship.
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- e) Understand the socio-cultural context of disease through the study of humanities.

7.2.2 Elements

- a) Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to the care of the patient (this will be part of integrated modules).
- b) Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training will be imparted in the time allotted for early clinical exposure).
- c) Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

7.3. Electives

7.3.1 Objectives: To provide the learner with opportunities:

- a) For diverse learning experiences,
- b) To do research/community projects that will stimulate enquiry, self-directed, experiential learning and lateral thinking.

7.3.2 Two months are designated for elective rotations after completion of the examination at end of the third MBBS Part I and before commencement of third MBBS Part II.

7.3.3 It is mandatory for learners to do an elective. The elective time should not be used to make up for missed clinical postings, shortage of attendance or other purposes.

7.3.4 Structure

- a) The learner shall rotate through two elective blocks of 04 weeks each.
- b) Block 1 shall be done in a pre-selected preclinical or para-clinical or other basic sciences laboratory OR under a researcher in an ongoing research project. During the electives regular clinical postings shall continue.
- c) Block 2 shall be done in a clinical department (including specialties, super-specialties, ICUs, blood bank and casualty) from a list of electives developed and available in the institution. OR as a supervised learning experience at a rural or urban community clinic.
- b) Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.

7.3.5 Each institution will develop its own mechanism for allocation of electives.

7.3.6 It is preferable that elective choices are made available to the learners in the beginning of the academic year.

7.3.7 The learner must submit a learning log book based on both blocks of the elective.

7.3.8 75% attendance in the electives and submission of log book maintained during elective is required for eligibility to appear in the final MBBS examination.

7.3.9 Institutions may use part of this time for strengthening basic skill certification.

7.4. Professional Development including Attitude, Ethics and Communication Module (AETCOM)

7.4.1 **Objectives** of the programme: At the end of the programme, the learner must demonstrate ability to:

- a) Understand and apply principles of bioethics and law as they apply to medical practice and research understand and apply the principles of clinical reasoning as they apply to the care of the patients.
- b) Understand and apply the principles of system based care as they relate to the care of the patient.
- c) Understand and apply empathy and other human values to the care of the patient.
- d) Communicate effectively with patients, families, colleagues and other health care professionals.
- e) Understand the strengths and limitations of alternative systems of medicine.
- f) Respond to events and issues in a professional, considerate and humane fashion.
- g) Translate learning from the humanities in order to further his / her professional and personal growth.

7.4.2 Learning experiences:

- a) This will be a longitudinal programme spread across the continuum of the MBBS programme including internship.
 - b) Learning experiences may include – small group discussions, patient care scenarios, workshop, seminars, role plays, lectures etc.
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- c) Attitude, Ethics & Communication Module (AETCOM module) developed by Medical Council of India should be used longitudinally for purposes of instruction.

7.4.3 75% attendance in Professional Development Programme (AETCOM Module) is required for eligibility to appear for final examination in each professional year.

7.4.4 Internal Assessment will include:

Written tests comprising of short notes and creative writing experiences,
OSCE based clinical scenarios / viva voce.

7.4.5 At least one question in each paper of the clinical specialties in the University examination should test knowledge competencies acquired during the professional development programme.

7.4.6 Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.

7.5. Learner-doctor method of clinical training (Clinical Clerkship)

7.5.1 **Goal:** To provide learners with experience in:

- a) Longitudinal patient care,
- b) Being part of the health care team,
- c) Hands-on care of patients in outpatient and inpatient setting.

7.5.2 **Structure:**

- a) The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- b) The learner-doctor programme will progress as outlined in Table 9.
- c) The learner will function as a part of the health care team with the following responsibilities:
 - I. Be part of the unit's outpatient services on admission days,
 - II. Remain with the admission unit until 6 PM except during designated class hours,
 - III. Be assigned patients admitted during each admission day for whom he/she will undertake responsibility, under the supervision of a senior resident or faculty member,

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- IV. Participate in the unit rounds on its admission day and will present the assigned patients to the supervising physician
 - V. Follow the patient's progress throughout the hospital stay until discharge
 - VI. Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients (according to responsibilities outlined in table 9)
 - VII. Participate in unit rounds on at least one other day of the week excluding the admission day
 - VIII. Discuss ethical and other humanitarian issues during unit rounds
 - IX. Attend all scheduled classes and educational activities
 - X. Document his/her observations in a prescribed log book / case record.

(d) No learner will be given independent charge of the patient

- (e) The supervising physician will be responsible for all patient care decisions

7.5.3 Assessment:

- a) A designated faculty member in each unit will coordinate and facilitate the activities of the learner, monitor progress, provide feedback and review the log book/ case record.
- b) The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.
- c) The log book should also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

Table 9: Learner - Doctor programme (Clinical Clerkship)

Year of Curriculum	Focus of Learner – Doctor Programme
Year – 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness
Year – 2	History taking, physical examination, assessment of change in clinical status, communication and patient education
Year – 3	All of the above and choice of investigations, basic procedures and continuity of care
Year - 4	All of the above and decision making, management and outcomes

CHAPTER III

COMPETENCY BASED CURRICULUM OF THE INDIAN MEDICAL GRADUATE PROGRAMME

8. Specific Competencies

8.1. Preamble:

The salient feature of the revision of the medical curriculum in 2019 is the emphasis on learning which is competency-based, integrated and learner-centered acquisition of skills and ethical & humanistic values.

Each of the competencies described below must be read in conjunction with the goals of the medical education as listed in items 2 to 3.5.5.

It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline. Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self-directed learning. Learners must be encouraged to take active part in and shared responsibility for their learning.

The global competencies to be achieved by the learner are outlined above in Chapter 1- section 3. Since the MBBS programme assessment will continue to be subject based, subject specific competencies have been outlined. These have to be acquired by the learner in the corresponding professional year. These competencies must be interpreted in the larger context outlined in section 3 and may be considered as “sub competencies” of the global competencies.

8.2. Integration

Must be horizontal (i.e. across disciplines in a given phase of the course) and vertical (across different phases of the course). As far as possible, it is desirable that teaching/ learning occurs in each phase through study of organ systems or disease blocks in order to align the learning process. Clinical cases must be used to integrate and link learning across disciplines.

Pre-clinical Subjects

HUMAN ANATOMY

Competencies:

The undergraduate must demonstrate:

1. Understanding of the gross and microscopic structure and development of human body
2. Comprehension of the normal regulation and integration of the functions of the organs and systems on basis of the structure and genetic pattern
3. Understanding of the clinical correlation of the organs and structures involved and interpret the anatomical basis of the disease presentations

Integration:

The teaching should be aligned and integrated horizontally and vertically in organ systems with clinical correlation that will provide a context for the learner to understand the relationship between structure and function and interpret the anatomical basis of various clinical conditions and procedures.

Anatomy

I. GOAL:

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

II. COURSE OUTCOMES:

A) KNOWLEDGE:

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

1. Comprehend the normal disposition, clinically relevant interrelationship, functional and cross sectional anatomy of the various structures in the body.

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

3. Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions of the organs and systems; He/She shall be able to locate the site of gross lesions according to the deficits encountered.

4. Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He/She shall be able to explain the developmental basis of the major variations and abnormalities.

B) SKILLS:

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

1. Identify and locate all the structures of the body and mark the topography of the living anatomy.
2. Identify the organs and tissues under the microscope.
3. Understand the principles of karyotyping and identify the gross congenital anomalies.
4. Understand principles of newer imaging techniques and interpretation of Computerized Tomography (CT) Scan, Sonogram etc.
5. Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture etc.

C) INTEGRATION

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

Teaching Hours Total number of teaching hours - **675Hours.**

Theory:

Lectures	220Hours
SDL	40 Hours
Total	260 Hours

Practical:

Dissection, Small Group Discussion, Integrated learning	tutorials, 335Hours
Histology	80 Hours
Total	415 Hours

Early clinical exposure (ECE): 30 hours
(12 hrs clinical skills +18 hrs Basic science correlation)

Teaching/Learning Methods

- Didactic lectures.
- Dissection/Prosected parts demonstrations/instructions on Mannequins.
- Histology lab-slide study.
- Small group teaching-such as a) Demonstrations b)Tutorials c)Seminars d)Problem based learning e) Discussions for poor performers.
- Surface marking.
- Imaging Anatomy- Radiograms, MRI, ultrasound, etc.
- e-mode of learning of some of the topics.
- Visit to the museum.
- Integrated teaching at horizontal and vertical levels.
- Batch-wise posting to Radiology and Endoscopies.
- Study of charts & models.
- Self-directed learning.
- Writing assignments.
- Preparation of scientific article.

COMPETENCIES	CORE	NON CORE	HOURS
GENERAL ANATOMY AN 1.1 – AN 7.8			12 hrs
Anatomical terminology	√		
General features of bones & Joints	√		
General features of Muscle	√		
General features of skin and fascia	√		
General features of the cardiovascular system	√		
General Features of lymphatic system	√		
Introduction to the nervous system	√		
GENERAL HISTOLOGY AN65.1 – AN 72.1			10 hrs
Epithelium histology, Connective tissue histology, Muscle histology, Nervous tissue histology, Blood Vessels, Glands & Lymphoid tissue, Bone & Cartilage, skin and its appendages under the microscope and correlate the structure with function.	√		
GENERAL EMBRYOLOGY AN 76.1 – 80.7 ,AN 25.1			10 hrs
Introduction to embryology, Gametogenesis and fertilization, Second week of development.	√		
3rd to 8th week of development.	√		
Fetal membranes, placenta and umbilical cord, fetal circulation and changes occurring at birth.	√		
UPPER LIMB AN8.1 – AN 13.8			14hrs
OSTEOLOGY:	√		10hrs
Features of individual bones,			
Pectoral region, Axilla.	√		
Shoulder and Scapular region, Arm & Cubital fossa.			
Forearm & hand, General Features, Joints, radiographs & surface marking.	√		
Development of mammary gland, development of upper limb.		√	
Describe the arterial anastomosis around the scapula.		√	
Anastomosis around the elbow joint.		√	

COMPETENCIES	CORE	NON CORE	HOURS
Lower limb AN14.1 – AN 20.10			14 hrs
OSTEOLOGY:			10 hrs
Features of individual bones, radiographs & surface marking.	√		
Front & Medial side of thigh, Gluteal region & back of thigh, Hip Joint, Knee joint, Anterolateral compartment of leg & dorsum of foot, Back of Leg & Sole, General Features, Joints, Anatomical basis of Metatarsalgia, Plantar fasciitis, Flat foot, club foot.		√	
The subtalar and transverse tarsal joints.		√	
Development of lower limb.		√	
THORAX AN 21.1-AN 25.4			11hrs
OSTEOLOGY: Thoracic cage. Features of sternum, typical rib, 1st rib and typical thoracic vertebra	√		10hrs
Boundaries of thoracic inlet, cavity and outlet, The extent, attachments, direction of fibres, nerve supply and actions of intercostal muscles, origin, course, relations and branches of a typical intercostal nerve, Mention origin, course and branches/ tributaries of: 1) anterior & posterior intercostal vessels, 2) internal thoracic vessels.	√		
Features and movements of manubriosternal, costovertebral, costotransverse and xiphisternal joints, Mechanics and types of respiration, boundaries and contents of the superior, anterior, middle and posterior mediastinum.	√		
Subdivisions, sinuses in pericardium, blood supply and nerve supply of pericardium.	√		
External and internal features of each chamber of heart, Origin, course and branches of coronary arteries, Formation, course, tributaries and termination of coronary sinus, The fibrous skeleton of heart, Conducting system of heart. Formation, course, tributaries and termination of coronary sinus, Fibrous skeleton of heart.	√		
Mediastinum – oesophagus, thoracic duct, arch of aorta, azygos and hemiazygos veins, location and extent of thoracic sympathetic chain.	√		
Lungs & Trachea - blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura, the pleural recesses and their applied anatomy, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate, bronchopulmonary segment, phrenic nerve. Blood supply, lymphatic drainage and nerve supply of lungs with surface marking ,systemic embryology,radiology and histology.	√		

COMPETENCIES	CORE	NON CORE	HOURS
Embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula.	√		
Developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta.	√		
AN 25.7 Structures seen on a plain x-ray chest (PA view)	√		
AN 25.9 Surface marking of lines of pleural reflection, lung borders and fissures, trachea, heart borders, apex beat & surface projection of valves of heart.	√		
AN 25.6 Development of aortic arch arteries, SVC, IVC and coronary sinus.		√	
AN 25.8 Barium swallow.		√	
HEAD AND NECK			22hrs
SKULL OSTEOLOGY			10hrs
AN 26.1 Anatomical position of skull, Identify and locate individual skull bones in skull.	√		
AN 26.2 Features of norma frontalis, verticalis, occipitalis, lateralis and basalis.	√		
AN 26.3 Cranial cavity, its subdivisions, foramina and structures passing through them.	√		
AN 26.4 Morphological features of mandible.	√		
AN 26.5 Features of typical and atypical cervical vertebrae (atlas and axis).	√		
AN 26.6 Concept of bones that ossify in membrane.	√		
AN 26.7 Features of the 7th cervical vertebra.	√		
SCALP			
AN 27.1 Layers of scalp, its blood supply, its nerve supply and surgical importance.	√		
AN 27.2 Emissary veins with its role in spread of infection from extra cranial route to intracranial venous sinuses.	√		
FACE & PAROTID REGION			
AN 28.1 Muscles of facial expression and their nerve Supply.	√		
AN 28.2 Sensory innervation of face.	√		

COMPETENCIES	CORE	NON CORE	HOURS
AN 28.3 Origin /formation, course, branches /tributaries of facial vessels.	√		
AN 28.4 Branches of facial nerve with distribution.	√		
AN 28.5 Cervical lymph nodes and lymphatic drainage of head, face and neck.	√		
AN 28.6 Superficial muscles of face, their nerve supply and actions.	√		
AN 28.7 Anatomical basis of facial nerve palsy.	√		
AN 28.8 Surgical importance of deep facial vein parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance.	√		
AN 28.9 Anatomical basis of Frey's syndrome.		√	
POSTERIOR TRIANGLE OF NECK			
AN 29.1 Attachments, nerve supply, relations and actions of sternocleidomastoid.	√		
AN 29.2 Anatomical basis of Erb's & Klumpke's palsy.	√		
AN 29.3 Anatomical basis of wry neck.		√	
AN 29.4 Demonstrate attachments of 1) inferior belly of omohyoid, 2) scalenus anterior, 3) scalenus medius & 4) levator scapulae.		√	
Cranial cavity			
An 30.1 Cranial fossae & identify related structures.	√		
AN 30.2 Major foramina with structures passing through them.	√		
AN 30.3 Dural folds & dural venous sinuses.	√		
AN 30.4 Clinical importance of dural venous sinuses.	√		
AN 30.5 Effect of pituitary tumours on visual pathway.		√	
ORBIT			
AN 31.1 Extra ocular muscles of eyeball.	√		
AN 31.2 Nerves and vessels in the orbit.	√		
AN31.4 Components of lacrimal apparatus.	√		

COMPETENCIES	CORE	NON CORE	HOURS
AN 31.5 Anatomical basis of oculomotor, trochlear and abducent nerve palsies along with strabismus.	√		
AN 31.3 Anatomical basis of Horner's syndrome.		√	
ANTERIOR TRIANGLE			
AN 32.1 Boundaries and subdivisions of anterior triangle.	√		
AN 32.2 Boundaries and contents of muscular, carotid, digastric and submental triangles.	√		
TEMPORAL AND INFRATEMPORAL REGIONS			
AN 33.1 Extent, boundaries and contents of temporal and infratemporal fossae.	√		
AN 33.2 Attachments, direction of fibres, nerve supply and actions of muscles of mastication.	√		
AN 33.3 Articulating surface, type & movements of temporomandibular joint.	√		
AN 33.4 Clinical significance of pterygoid venous plexus.	√		
AN 33.5 Features of dislocation of temporomandibular joint.			
SUBMANDIBULAR REGION			
AN 34.1 Morphology, relations and nerve supply of submandibular salivary gland & submandibular ganglion.	√		
AN 34.2 Basis of formation of submandibular stones.	√		
DEEP STRUCTURES IN THE NECK			
AN 35.1 Parts, extent, attachments, modifications of deep cervical fascia.	√		
An 35.2 Location, parts, borders, surfaces, relations & Blood supply of thyroid gland.	√		
AN 35.3 Origin, parts, course & branches subclavian Artery.	√		
AN 35.4 Origin, course, relations, tributaries and Termination of internal jugular & brachiocephalic veins.	√		
An 35.5 Drainage & applied anatomy of cervical Lymph nodes.			

COMPETENCIES	CORE	NON CORE	HOURS
AN 35.6 Formation, relation & branches of Cervical sympathetic chain.	√		
AN 35.7 Course and branches of IX, X, XI & XII nerve in the neck.	√		
AN 35.8 Anatomically relevant clinical features of Thyroid swellings.		√	
AN 35.9 Clinical features of compression of subclavian artery and lower trunk of brachial plexus by cervical rib.		√	
AN 35.10 Fascial spaces of neck.	√		
MOUTH, PHARYNX & PALATE			
AN 36.1 1) Morphology, relations, blood supply and applied anatomy of palatine tonsil . 2) composition of soft palate.	√		
AN 36.2 Components and functions of Waldeyer's lymphatic ring.	√		
AN 36.3 Boundaries and clinical significance of pyriform fossa.	√		
AN 36.4 Anatomical basis of tonsillitis, tonsillectomy, adenoids and peri-tonsillar abscess.		√	
CAVITY OF NOSE			
AN 37.1 Features of nasal septum, lateral wall of nose, their blood supply and nerve supply.	√		
AN 37.2 Location and functional anatomy of paranasal sinuses.	√		
AN 37.3 Anatomical basis of sinusitis & maxillary sinus tumours.	√		
LARYNX			
AN 38.1 Morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx.	√		
AN 38.2 Anatomical aspects of laryngitis.		√	
AN 38.3 Anatomical basis of recurrent laryngeal nerve injury.		√	

COMPETENCIES	CORE	NON CORE	HOURS
TONGUE			
AN 39.1 morphology, nerve supply, embryological basis of nerve supply, blood supply, lymphatic drainage and actions of extrinsic and intrinsic muscles of tongue.	√		
AN 39.2 Anatomical basis of hypoglossal nerve palsy.		√	
ORGANS OF HEARING AND EQUILIBRIUM			
AN 40.1 Parts, blood supply and nerve supply of external Ear.	√		
AN 40.2 Boundaries, contents, relations and functional anatomy of middle ear and auditory tube.	√		
AN 40.3 Features of internal ear.		√	
AN 40.4 Anatomical basis of otitis externa and otitis media		√	
AN 40.5 Anatomical basis of myringotomy	√		
EYEBALL			
AN 41.1 Parts and layers of eyeball		√	
AN 41.2 Anatomical aspects of cataract, glaucoma & central retinal artery occlusion.		√	
AN 41.3 Position, nerve supply and actions of intraocular muscles.		√	
BACK REGION			
AN42.1 Contents of the vertebral canal.	√		
AN42.2 Demonstrate the boundaries and contents of Suboccipital triangle.	√		
AN42.3 Position, direction of fibres, relations, nerve supply, actions of semispinalis capitis and splenius capitis.	√		
HEAD & NECK JOINTS, HISTOLOGY, DEVELOPMENT, RADIOGRAPHY & SURFACE MARKING			
AN 43.1 The movements with muscles producing the movements of atlantooccipital joint & atlantoaxial joint.	√		
AN 43.2 Microanatomy of pituitary gland, thyroid, parathyroid gland, tongue, salivary glands, tonsil, epiglottis, cornea, retina.	√		
AN 43.3 Microanatomy of olfactory epithelium, eyelid, lip, sclero-corneal junction, optic nerve, cochlea- organ of corti, pineal gland.	√		
AN 43.4 Development and developmental basis of congenital anomalies of face, palate, tongue, branchial apparatus, pituitary gland, thyroid gland & eye.	√		

COMPETENCIES	CORE	NON CORE	HOURS
AN 43.5 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.	√		
AN 43.6 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.	√		
AN 43.7 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.	√		
AN 43.8 Describe the anatomical route used for carotid angiogram and vertebral angiogram.		√	
AN 43.9 Anatomical structures in carotid angiogram and vertebral angiogram.		√	
ABDOMEN (AN44.1 ,AN47.2,AN 47.5 AN 47.8-AN 47.11,AN 47.13) .			25hrs
Planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen Anterior abdominal wall, rectus sheath, extent, boundaries, contents of Inguinal canal including Hesselbach's triangle.	√		
Posterior abdominal wall Thoracolumbar fascia, lumbar plexus	√		
Male external genitalia.	√		
Abdominal cavity, boundaries and recesses of Lesser & Greater sac, peritoneal folds & pouches, major viscera of abdomen.	√		
Formation, course relations and tributaries of Portal vein, Inferior vena cava & Renal vein, origin, course, important relations and branches of Abdominal aorta, Coeliac trunk, Superior mesenteric, Inferior mesenteric & Common iliac artery.	√		
Sites of portosystemic anastomosis.	√		
Anatomic basis of hematemesis & caput medusae in portal hypertension.	√		
Attachments, openings, nerve supply & action of the thoracoabdominal diaphragm.	√		

COMPETENCIES	CORE	NON CORE	HOURS
AN 44.7 Common Abdominal incisions.		√	
AN 45.3 Major subgroups of back muscles, nerve supply and action.		√	
AN 46.4 anatomical basis of Varicocoele.		√	
AN 46.5 Phimosis & Circumcision.		√	
AN 47.3 Anatomical basis of Ascites & Peritonitis.		√	
AN 47.4 Anatomical basis of Subphrenic abscess.		√	
AN 47.6 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.		√	
AN 47.7 Clinical importance of Calot's triangle.		√	
AN 47.12 important nerve plexuses of posterior abdominal wall.		√	
AN 47.14 Abnormal openings of thoracoabdominal diaphragm and diaphragmatic hernia.		√	
AN 45.3 Major subgroups of back muscles, nerve supply and action.		√	
PELVIC WALL AND VISCERA			
AN 48.1-AN 48.4 Muscles of Pelvic diaphragm, male & female pelvic viscera, internal iliac artery, sacral plexus.	√		
AN 48.5 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.		√	
AN 48.6 Neurological basis of Automatic bladder.		√	
AN 48.7 Lobes involved in benign prostatic hypertrophy & prostatic cancer, structures palpable during vaginal & rectal examination.		√	

COMPETENCIES	CORE	NON CORE	HOURS
PERINEUM			
AN 49.1-AN 49.4 Superficial & deep perineal pouch, Perineal body, Perineal membrane in male & female, content & applied anatomy of Ischiorectal fossa.		√	
AN 49.5 Anatomical basis of Perineal tear, Episiotomy, Perianal abscess and Anal fissure.	√		
VERTEBRAL COLUMN			
AN 50.1 –AN 50.3 Curvatures of the vertebral column, type, articular ends, ligaments and movements of Intervertebral joints, Sacroiliac joints & Pubic symphysis, lumbar puncture.	√		
AN 50.4 Anatomical basis of Scoliosis, Lordosis, Prolapsed disc, Spondylolisthesis & Spina bifida.	√		
SECTIONAL ANATOMY			
AN 51.1 Cross-section at the level of T8, T10 and L1 (transpyloric plane)	√		
AN 51.2 Midsagittal section of male and female pelvis.	√		
SYSTEMIC HISTOLOGY & EMBRYOLOGY			24hrs
AN 52.1 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.	√		
AN52.2 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.	√		
AN 52.5 Development and congenital anomalies of Diaphragm.	√		
AN 52.6 Congenital anomalies of: Foregut, Midgut & Hindgut.	√		
AN 52.7 Development of Urinary system.	√		
AN 52.8 Development of male & female reproductive system.	√		
AN 52.3 Microanatomical features of Cardiooesophageal junction, Corpus luteum.		√	
AN 52.4 Development of anterior abdominal wall.		√	

COMPETENCIES	CORE	NON CORE	HOURS
OSTEOLOGY OF ABDOMEN AND PELVIS			10hrs
AN53.1 Bones of abdomen and pelvis, attachments of muscle groups.	√		
AN53.2 Bony pelvis & show boundaries of pelvic inlet, pelvic cavity, pelvic outlet.	√		
AN53.3 True pelvis and false pelvis and demonstrate sex determination in male & female bony pelvis.	√		
AN53.4 Clinical importance of bones of abdominopelvic region (sacralization of lumbar vertebra, Lumbarization of 1st sacral vertebra, types of bony pelvis & Coccyx)		√	
RADIO DIAGNOSIS (AN54.1-AN54.3)	√		5hrs
Features of plain X ray abdomen, special radiographs of abdominopelvic region (contrast X ray, Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography & Hysterosalpingography)			
AN54.3 Role of ERCP, CT abdomen, MRI, Arteriography in radiodiagnosis of abdomen.		√	
SURFACE MARKING	√		5hrs
AN 55.1 –AN 55.2 Surface marking of; Regions and planes of abdomen, Superficial inguinal ring, Deep inguinal ring.			
McBurney's point, Renal Angle & Murphy's point, surface projections of: Stomach, Liver, Fundus of gall bladder, Spleen, Duodenum, Pancreas, Ileocaecal junction, Kidneys & Root of mesentery.	√		
NEUROANATOMY MENINGES & CSF			10hrs
AN56.1 Various layers of meninges with its extent & Modifications.	√		
AN 56.2 Circulation of CSF with its applied anatomy.	√		
SPINAL CORD			
AN 57.1 External features of spinal cord.	√		
AN 57.2 Extent of spinal cord in child & adult with its clinical implication.	√		
AN 57.3 Transverse section of spinal cord at mid-cervical & midthoracic level.	√		
AN 57.4 Ascending & descending tracts at mid thoracic level of spinal cord.	√		
AN 57.5 Anatomical basis of syringomyelia.		√	

COMPETENCIES	CORE	NON CORE	HOURS
MEDULLA OBLONGATA			
AN 58.1 External features of medulla oblongata.	√		
AN 58.2 Transverse section of medulla oblongata at the level of 1)pyramidal decussation, 2) sensory decussation 3) ION.	√		
AN 58.3 Nerve nuclei in medulla oblongata with their functional group.	√		
AN 58.4 Anatomical basis & effects of medial & lateral medullary syndrome.	√		
PONS			
AN 59.1 External features of pons.	√		
AN 59.2 Transverse section of pons at the upper and lower level.	√		
AN 59.3 Cranial nerve nuclei in pons with their functional group.	√		
CEREBELLUM			
AN 60.1 External & internal features of cerebellum.	√		
AN 60.2 Connections of cerebellar cortex and intracerebellar nuclei.	√		
AN 60.3 Anatomical basis of cerebellar dysfunction.	√		
MIDBRAIN			
AN 61.1 External & internal features of midbrain.	√		
AN 61.2 Internal features of midbrain at the level of superior & inferior colliculus.	√		
AN 61.3 Anatomical basis & effects of Benedict's and Weber's syndrome.	√		
CRANIAL NERVE NUCLEI & CEREBRAL HEMISPHERES			
AN 62.1 Cranial nerve nuclei with its functional component.	√		
AN 62.2 Sulci, gyri, poles, & functional areas of cerebral hemisphere.	√		
AN 62.3 White matter of cerebrum.	√		
AN 62.4 Parts & major connections of basal ganglia & limbic lobe.	√		

COMPETENCIES	CORE	NON CORE	HOURS
AN 62.5 Boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus.	√		
AN 62.6 Branches & major areas of distribution of circle of Willis.	√		
VENTRICULAR SYSTEM			
AN 63.1 Parts, boundaries & features of III rd , IV th & lateral ventricle.	√		
AN 63.2 Anatomical basis of congenital hydrocephalus.		√	
HISTOLOGY & EMBRYOLOGY			
AN 64.1 Microscopic features of Spinal cord, Cerebellum & Cerebrum.	√		
AN 64.2 Development of neural tube, spinal cord, medulla oblongata.	√		
AN 64.3 Pons, midbrain, cerebral hemisphere & cerebellum.	√		
AN 64.4 Types of open neural tube defects with its embryological basis.		√	
GENETICS CHROMOSOMES			8hrs
AN 73.1 Structure of chromosomes with classification.	√		
AN 73.2 Technique of karyotyping with its applications.	√		
AN 73.3 Lyon's hypothesis.	√		
PATTERNS OF INHERITANCE			
AN 74.1 Various modes of inheritance with examples.	√		
AN 74.2 Various types of inheritance & give examples of diseases of each mode of inheritance.	√		
AN 74.3 Multifactorial inheritance with examples.	√		
AN 74.4 Genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & Sickle cell anaemia.		√	

COMPETENCIES	CORE	NON CORE	HOURS
PRINCIPLE OF GENETICS, CHROMOSOMAL ABERRATIONS & CLINICAL GENETICS			
AN 75.1 Structural and numerical chromosomal aberrations.	√		
AN 75.4 Genetic basis of variation: polymorphism and mutation.	√		
AN 75.5 Principles of genetic counselling.	√		
AN 75.2 Mosaics and chimeras with example.		√	
AN 75.3 Genetic basis & clinical features of Prader Willi syndrome, Edward syndrome & Patau syndrome.		√	
PRENATAL DIAGNOSIS			
AN 81.1 Methods of prenatal diagnosis.	√		
AN 81.2 indications, process and disadvantages of amniocentesis.	√		
AN81.3 Indications, process and disadvantages of chorion villus biopsy.	√		
ETHICS IN ANATOMY			
AN 82.1 Respect and correct procedure when handling cadavers and other biologic tissue.	√		
Embalming techniques.		√	
Biohazards of formaldehyde.		√	

2. PRACTICALS	415 Hours
GROSS ANATOMY:	335 Hours
Upper Limb :	Pectoral, scapular and shoulder region, arm, forearm. 43 Hours
Prosected:	Joints, Palm and dorsum of hand.
Thorax :	Chest wall, mediastinum, lungs, and heart. Cross sectional T-3, T-4 and T-5 Levels. 37 Hours
Abdomen:	Anterior abdominal wall and inguinal region. Viscera and posterior abdominal wall- Cross sections at L-1, L-2 and L-4 levels. 77 Hours
Pelvis:	Pelvic viscera, blood vessels and nerves sagittal section of male and female. 21Hours
Prosection:	Perineum including ischio- rectal fossa.
Lower Limb:	Gluteal region, front, medial and back of thigh, popliteal fossa, leg and dorsum of foot. 37 Hours
Prosection Parts :	Sole of the foot and joints.
Head & Neck:	Scalp, Superficial and deep dissection of face and neck. Submandibular region, Temporal and infratemporal fossa, cranial cavity, naso and oropharyngeal regions, Ear, larynx and pharynx. Cross sections at C-4 and C-6 levels. Sagittal Section of Head & Neck. 96 Hours
Prosection :	Orbit, eyeball,
Nervous System:	Sections of brain and. Gross structure of brain and spinal cord and study of gross sections as mentioned earlier. 24 Hours
Prosection :	Specimens of sections of the brain and major functional areas.

Demonstrations

- Brain and spinal cord
- Cross- sectional anatomy
- Radiological anatomy
- Ultrasound, CT and MRI

HISTOLOGY FOR CERTIFIABLE

80 Hours

(A) General Histology

20 Hours

Microscope

Cell

Simple Epithelium

Compound Epithelium

4 Hours

Connective Tissue.

2 Hours

Muscular tissue

2 Hours

Nerve tissue - TS & LS of peripheral nerve, optic nerve, sensory & sympathetic ganglia.

2 Hours

Epithelial glands (serous, mucous and mixed salivary glands)

2 Hours

Circulatory system (large size artery, medium size artery, large size vein,)

2 Hours

Lymphatic System (lymph node, thymus, tonsil and spleen)

2 Hours

Skin & its appendages

2 Hours

Placenta & umbilical cord

2 Hours

(B) Systemic Histology

60 Hours

Respiratory system - trachea and lung.

6 Hours

Digestive system - Lip, tongue, oesophagus, stomach, small and large intestine, Liver, Gall bladder and Pancreas.

20 Hours

Urinary System - kidney, ureter, urinary bladder and urethra

6 Hours

Reproductive System - female - ovary, ovarian tube and uterus

6 Hours

Reproductive System - male - testis, epididymis, vas deferens and prostate gland.

6 Hours

Hypophysis cerebri, thyroid and suprarenal.

6 Hours

Eye (Cornea and Retina)

4 Hours

Neuro histology – Cerebrum, cerebellum, Spinal Cord

6 Hours

DOAP TOPICS

Anatomical position, various planes, relation, Comparison, laterality & movement in our body.

Parts of a long bone.

Various bones in articulated hand, specify the parts of Metacarpals and phalanges and enumerate the peculiarities of pisiform.

Scaphoid fracture and explain the anatomical basis of avascular Necrosis.

Boundaries and contents of axilla.

Attachment of Serratus anterior with its action.

Shoulder joint for- type, articular surfaces, Capsule, synovial membrane, ligaments, relations, movements, muscles Involved, blood supply, nerve supply and applied anatomy.

Different types of skin & dermatomes in body.

Superficial fascia along with fat distribution in body.

Modifications of deep fascia with its functions.

Identify the given bone, its side, important features & keep it in anatomical Position.

Joints formed by the given bone.

Peculiarities of clavicle.

Important muscle attachment on the given bone.

Different types of skin & dermatomes in body.

Structure & function of skin with its appendages.

Superficial fascia along with fat distribution in body.

Modifications of deep fascia with its functions.

Identify the given bone, its side, important features & keep it in Anatomical Position.

Joints formed by the given bone.

Peculiarities of clavicle.

Important muscle attachment on the given bone.

Various bones in articulated hand, specify the parts of Metacarpals and phalanges and enumerate the peculiarities of pisiform.

Scaphoid fracture and explain the anatomical basis of avascular Necrosis.

Boundaries and contents of axilla.

The origin, extent, course, parts, Relations and branches of axillary artery & tributaries of vein.

The position, attachment, nerve Supply and actions of trapezius and Latissimus dorsi.

The deltoid and rotator cuff muscles.

Attachment of Serratus anterior with its action.

Shoulder joint for- type, articular surfaces, Capsule, synovial membrane, ligaments, relations, movements, muscles Involved, blood supply, nerve supply and applied anatomy.

Muscle groups of upper arm with emphasis on Biceps and triceps brachii.

Origin, course, relations, branches (or tributaries), Termination of important nerves and vessels in arm.

Boundaries and contents of cubital fossa.

Important muscle groups of ventral forearm With attachments, nerve supply and actions.

Origin, course, relations, branches (or tributaries), Termination of important nerves and vessels of forearm.

Flexor retinaculum with its attachments.

Small muscles of hand. Also describe movements of Thumb and muscles involved.

Movements of thumb and muscles involved.

Course and branches of important blood vessels and Nerves in hand.

Fibrous flexor sheaths, ulnar bursa, radial bursa and Digital synovial sheaths.

Important muscle groups of dorsal Forearm with attachments, nerve supply and actions.

Origin, course, relations, branches (or tributaries), Termination of important nerves and vessels of back of forearm.

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.

The given bone, its side, important features & keep it in Anatomical Position.

Joints formed by the given bones.

Various bones in the articulated foot with individual Muscle attachment

Origin, course, relations, branches (or Tributaries), termination of important nerves and vessels of anterior thigh.

Muscles with their attachment, nerve Supply and actions

Boundaries, floor, roof and contents of Femoral Triangle

Anatomical basis of psoas abscess & femoral hernia

Adductor canal with its content

Origin, course, relations, branches (or Tributaries), termination of important nerves and vessels of gluteal region.

Anatomical basis of sciatic nerve injury during gluteal intramuscular injections

The anatomical basis of Trendelenburg sign

The hamstrings group of muscles with their attachment, nerve supply and actions

The origin, course, relations, branches (or tributaries), termination of important nerves and vessels on the back of thigh.

The boundaries, roof, floor, contents and relations of popliteal fossa.

Boundaries, floor, roof and contents of Femoral Triangle.

Anatomical basis of psoas abscess & Femoral hernia.

Adductor canal with its content.

Origin, course, relations, branches (or tributaries), termination of important nerves and vessels of gluteal region.

Anatomical basis of sciatic nerve injury during gluteal intramuscular injections.

Anatomical basis of trendelenburg sign .

The hamstrings group of muscles with their attachment, nerve supply and actions.

The origin, course, relations, branches (or tributaries), termination of important nerves and vessels on the back of thigh.

The boundaries, roof, floor, contents and relations of popliteal fossa.

The type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the hip joint.

Major muscles of anterior compartment of leg with their attachment, nerve supply and actions.

Origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior Compartment of leg.

The anatomical basis of foot drop

The type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood And nerve supply, bursae around the knee joint.

The major muscles of back of leg with their attachment, nerve supply and actions.

The origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of leg.

The type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood And nerve supply of tibiofibular and ankle joint.

The subtalar and transverse tarsal joints

Fascia lata, venous drainage, lymphatic drainage, retinacula & dermatomes of lower limb.

The bones and joints of lower limb seen in anteroposterior and lateral view radiographs of various regions of lower limb.

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 bone.

Palpation of femoral, popliteal, post tibial, anti tibial & dorsalis pedis blood vessels in a simulated environment.

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.

The salient features of sternum, typical rib, 1st rib and Typical thoracic vertebra.

The features of 2nd, 11th and 12th ribs, 1st, 11th and 12th Thoracic vertebrae.

The boundaries of thoracic inlet, cavity and outlet.

Extent, attachments, direction of fibres, nerve Supply and actions of intercostal muscles.

Origin, course, relations and branches of a typical Intercostal nerve.

Type, articular surfaces & movements of Manubriosternal, costovertebral, costotransverse and xiphisternal joints.

Mechanics and types of respiration.

Subdivisions, sinuses in pericardium, blood supply And nerve supply of pericardium.

And internal features of each chamber of Heart.

Origin, course and branches of coronary arteries.

He formation, course, tributaries and termination of coronary sinus.

The external appearance, relations, blood supply, nerve supply, lymphatic drainage and applied anatomy of oesophagus.

The extent, relations tributaries of thoracic duct and enumerate its applied anatomy.

Origin, course, relations, tributaries and Termination of superior venacava, azygos, hemiazygos and accessory hemiazygos veins.

The location and extent of thoracic sympathetic chain.

Side, external features and relations of structures which form root Of lung & bronchial tree and their clinical correlate.

Structures seen on a plain x-ray chest (PA view).

Barium swallow.

Anatomical position of skull, identify and locate individual Skull bones in skull.

The features of norma frontalis, verticalis, occipitalis, lateralis and Basalis.

Cranial cavity, its subdivisions, foramina and structures passing Through them.

Morphological features of mandible.

Features of typical and atypical cervical vertebrae (atlas and axis).

The features of the 7th cervical vertebra.

Muscles of facial expression and their nerve Supply.

Origin /formation, course, branches /tributaries of Facial vessels.

Branches of facial nerve with distribution.

Superficial muscles of face, their nerve supply and actions.

The parts, borders, surfaces, contents, relations And nerve supply of parotid gland with course of its duct and surgical Importance.

Attachments, nerve supply, relations and actions Of sternocleidomastoid.

The cranial fossae & identify related structures.

Major foramina with structures passing through them.

Dural folds & dural venous sinuses.

Extra ocular muscles of eyeball.

Nerves and vessels in the orbit.

Boundaries and contents of muscular, carotid, Digastric and submental triangles.

Extent, boundaries and contents of temporal and Infratemporal fossae.

Attachments, direction of fibres, nerve supply and Actions of muscles of mastication.

Articulating surface, type & movements of Temporomandibular joint.

The morphology, relations and nerve supply of Submandibular salivary gland & submandibular ganglion.

Location, parts, borders, surfaces, relations & Blood supply of thyroid gland.

The origin, parts, course & branches of Subclavian artery.

Origin, course, relations, tributaries and Termination of internal jugular & brachiocephalic veins.

Extent, drainage & applied anatomy of cervical Lymph nodes.

The extent, formation, relation & branches of Cervical sympathetic chain.

Features of nasal septum, lateral wall of nose, Their blood supply and nerve supply.

The morphology, identify structure of the wall, nerve supply, Blood supply and actions of intrinsic and extrinsic muscles of the larynx.

The morphology, nerve supply, embryological Basis of nerve supply, blood supply, lymphatic drainage and actions of Extrinsic and intrinsic muscles of tongue.

The parts, blood supply and nerve supply of external Ear.

The boundaries, contents, relations and Functional anatomy of middle ear and auditory tube.

Parts and layers of eyeball.

The contents of the vertebral canal.

The boundaries and contents of sub occipital Triangle.

The movements With muscles producing the movements of atlantooccipital joint & atlantoaxial joint.

The planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen.

The fascia, nerves & blood vessels of anterior Abdominal wall.

Extent, boundaries, contents of inguinal canal including Hesselbach's triangle.

Attachments of muscles of anterior abdominal wall.

Lumbar plexus for its root value, formation & branches.

Coverings, internal structure, side determination, Blood supply, nerve supply, lymphatic drainage & descent of testis with its Applied anatomy.

Boundaries and recesses of lesser & greater sac.

Various peritoneal folds & pouches with its explanation.

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.

The formation, course relations and tributaries of portal Vein, inferior vena cava & renal vein.

The origin, course, important relations and branches of Abdominal aorta, coeliac trunk, superior mesenteric, inferior mesenteric & Common iliac artery.

The attachments, openings, nerve supply & action of the thoracoabdominal diaphragm.

The muscles of pelvic diaphragm.

The (position, features, important peritoneal and Other relations, blood supply, nerve supply, lymphatic drainage and clinical Aspects of) important male & female pelvic viscera.

The origin, course, important relations and Branches of internal iliac artery.

The superficial & deep perineal pouch (boundaries and contents).

Perineal body.

Perineal membrane in male & female.

Boundaries, content & applied anatomy of Ischiorectal fossa.

He type, articular ends, ligaments and Movements of intervertebral joints, sacroiliac joints & pubic symphysis.

The cross-section at the level of t8, t10 and l1 (transpyloric plane).

The midsagittal section of male and female pelvis.

Bone in the anatomical position, describe the salient Features, articulations & demonstrate the attachments of muscle groups.

The anatomical position of bony pelvis & show boundaries of Pelvic inlet, pelvic cavity, pelvic outlet.

True pelvis and false pelvis and demonstrate sex determination in Male & female bony pelvis.

Clinical importance of bones of abdominopelvic Region (sacralization of lumbar vertebra, lumbarization of 1st sacral Vertebra, types of bony pelvis & coccyx).

Features of plain x ray abdomen.

The special radiographs of abdominopelvic region (contrast x ray barium swallow, barium meal, barium enema, Cholecystography, intravenous pyelography & hysterosalpingography).

The surface marking of regions and planes of abdomen, Superficial inguinal ring, deep inguinal ring, Mcburney's point, renal Angle & murphy's point.

The surface projections of: stomach, liver, fundus of gall Bladder, spleen, duodenum, pancreas, ileocaecal junction, kidneys & Root of mesentery.

Various layers of meninges with its extent & Modifications.

External features of spinal cord.

External features of medulla oblongata.

External features of pons.

External & internal features of cerebellum.

External & internal features of midbrain.

Surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere.

Formation, branches & major areas of distribution of Circle of Willis.

Parts, boundaries & features of IIIrd, IVth & lateral Ventricle.

EARLY CLINICAL EXPOSURE:**CLINICAL VISITS: 12 HOURS****BASIC SCIENCE CORRELATIONS: 18**

TOPIC	SETTING
Planes Of The Body	Classroom
Venae Puncture	Classroom/Skill Lab
Pleurocentesis	Classroom/Skill Lab
Coronary Angiography	Classroom/Hospital
Bell's Palsy, Strabismus	Classroom/Hospital
Examination Of Thyroid Swelling Surgical Anatomy Of Thyroid Gland	Classroom/Hospital
Examination Of Thyroid Swelling	Classroom/Hospital
Inguinal Hernia	Classroom/Hospital
Catheterisation	Classroom/Skill Lab
Episiotomy	Classroom/Skill Lab
Varicose Veins	Classroom/Hospital

LOG BOOK:

Logbook helps the student in maintaining a record of all the sessions conducted during the Foundation Course, Reflections on Early Clinical Exposure, Periodic assessment tests, Self-directed learning .

AITO topics

- Anemia
- Jaundice
- Diabetes
- Thyroid Diseases
- Nutrition
- Febrile Illness
- Tuberculosis
- Malaria
- Diarrhoea
- Ischemic Heart Disease
- Polycystic Ovarian Syndrome

AETCOM:

1. Module 1.1: cadaver as a teacher

Competencies addressed:

The student should be able to:	Level
1. Enumerate and incorporate the values of cadaveric oath.	KH
2. Exercise respect to the cadavers	KH
3. Understand the role of learner in following instructions in handling cadavers/cadaveric parts.	KH

SELF DIRECTED LEARNING:

Topic	Setting
Joints	Department
Extensor Retinaculum	Department
Heart – External Features & Interior	Department
Lungs	Department
Rectus Sheath	Department
Triangles of Neck	Department
Lymphatic drainage of head, face and neck	Department
Dural venous sinuses	Department
Knee Joint	Department
Arches of foot	Department

SCHEME OF EXAMINATION

******Medical Council of India. Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019:**

Eligibility to appear for university examinations:

A) Attendance:

Attendance requirements are 75% in theory and 80% in practical for eligibility to appear for the university examinations

B) Internal assessment:

Student must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in Anatomy in order to be eligible for appearing at the final University examination.

3 internal assessments will be conducted with 100 marks for theory and 100 marks for practicals.

Theory: 100 Marks

Type of Questions	Number of questions	Marks for each question	Total
Long Essay	02	10	20
Short Essay	06	05	30
Short Answer	10	03	30
		Total	80
MCQ's	20	01	20
Total IA marks			100

Note:

- ◆ Case based questions will be included in the internal assessment.
- ◆ The third internal assessment is the prelim examination which will be conducted on the lines of the university examination.
- ◆ Internal assessment will include questions from Early Clinical exposure, AITO, AETCOM
- ◆ Continuous assessments in the form of seminars, periodic assessment tests and part completion tests will be conducted at regular intervals.

Please note:

- ◆ Final Internal assessment marks submitted to the university will be 100 marks for theory and 100 marks for Practicals

Scheme for calculation of final internal assessment marks:

Theory	Marks	Practicals	Marks
		Practicals (OSPE)	60
Theory written paper (Including LEQ, SEQ & SAQ)	60	Viva	10
Formative Assessment (Quiz, PAT, PCT)	20	Logbook +record	20
MCQ	10	Professionalism	05
Seminar	10	AETCOM	05
Total	100		100

Average of the three internal assessment marks is taken into consideration for calculating the final marks for theory written paper and reduced to 60 while calculating final internal assessment marks to be sent to University. Likewise average of marks obtained in MCQs during the 3 internal assessments is reduced to 10. Similarly Average of Marks obtained by continuous Assessment tests like Quiz, PAT, PCT will be reduced to 20 and marks obtained for seminars is reduced to 10 which adds up to 100 marks will be sent as final theory internal assessment marks to University.

Practicals: 100 Marks

Three practical assessments in the form of OSPE and OSCE for 80 marks will be conducted along with viva for 20 marks. Average of best of three OSPE/OSCE marks will be taken and reduced to 60 for calculation of final assessment marks to be sent to University. Similarly average of viva marks is reduced to 10. Record maintenance & logbook will be assessed for 20 marks, Professionalism for 5 marks and AETCOM separately for 5 marks which adds up to 100 marks will be sent as final practical internal assessment marks to University.

Certifiable skills: will be evaluated as per checklist & certificate of accomplishment is awarded which is mandatory to take-up university exam. This will be assessed in log book.

University examination

Theory : 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be of three types.

Note:

Type of Questions	Number of questions	Marks for each question	Total
MCQ's	20	01	20
Long Essay	02	10	20
Short Essay	06	05	30
Short Answer	10	03	30
Total marks			100

- ◆ Distribution of chapters and suggested marks in parenthesis for Paper I and Paper II in Anatomy for University examination are as follows.
- ◆ Case based questions will be included in the university examination both in theory and MCQ's.

Distribution of chapters for paper I and II with weightage of marks in Anatomy for University Examination

PAPER – I	
Topics	Marks
Head and Neck	30
Brain, Spinal cord	10
Upper limb	20
Thorax including diaphragm	20
General Anatomy	
General Embryology	20
General Histology	
Total	100

PAPER – II	
Topics	Marks
Abdomen	30
Pelvis & Perineum	20
Lower limb	20
Systemic Histology - 10	
Genetics - 10	30
Systemic Embryology - 10	
Total	100

*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

Practical I:OSPE	50 marks

Clinical:	

Upper limb	05 marks
Lower limb	05 marks
Thorax	05 marks
Abdomen & Pelvis	10 marks
Head & Neck	05marks
Neuroanatomy	05 marks
Surface marking	05 marks
Osteology	05 marks
Radiology /	05 marks
Embryology	

Practical II:(OSPE)	30 marks

Histology-General	10 marks
Histology-Systemic	15 marks
Genetics	05marks

C. Viva-Voce Examination: 20 Marks

The viva-voce examination shall carry 20 marks and will be conducted by four examiners individually. The distribution of topics and marks for each examiner will be as under:

Osteology and soft parts in the regions of head and neck, brain and spinal cord, thorax including diaphragm and upper limb	5 marks
Osteology and soft parts in the region of abdomen, pelvis and lower limb	5 marks
Radiological anatomy	5 marks
Embryology	5 Marks

SCHEME OF MARKS DISTRIBUTION

University Examination:	
Theory	
Paper – I	100
Paper – II	100
University Examination :	
Practical	80
Vivavoce	20
Internal Assessment	
Theory	100
Practical/viva	100

Criteria for passing university examination

- ♦ The student must **secure at least 40% marks in each of the two theory papers** with **minimum 50% of marks in aggregate** (both papers together) to pass.
- ♦ The marks obtained in the viva examination will be added to the practical marks.
- ♦ The student **must secure a minimum of 50% of marks in aggregate in the viva and practical examination** (both combined) to pass.
- ♦ Student must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in Anatomy in order to be eligible for appearing at the final University examination.

Internal assessment marks will reflect as a separate head of passing at the summative examination and will not be added to the university marks.

- ♦ A **maximum number of four permissible attempts** would be available to clear the first Professional University examination, whereby the **first Professional course** will have to be **cleared** within **4 years of admission** to the said course. Partial attendance at any University examination shall be counted as an availed attempt.
- ♦ There shall be **one main examination** in an academic year and a **supplementary** to be held **not later than 90 days** after the declaration of the results of the main examination.

RECOMMENDED TEXT BOOKS AND REFERENCE BOOKS

Name of the book	Author	Publisher
Cunningham's Manual of Practical Anatomy Vols. I, II & III	G J Romanes	Oxford Medical publications
Essentials of Human anatomy, Part I, II, & "I	Datta A.K	Current Books International
Clinical Anatomy by Regions	R.S.Snell	Lippincott Williams & Wilkins
Grant's Atlas of Anatomy	Agur AMR,& Dalley A. F.	Lippincot Williams & Wilkins
Last's Regional and Applied Anatomy	RJ Last	Elsevier
Human Anatomy Vols. I, II & III	BD chaurasia	CBS Publishers
Atlas of Anatomy	Patrick W. Tank & Thomas R. Gest	Lippincot Williams & Wilkins
Text book of Histology	Inderbir Singh	Jaypee Brothers
Difiore's Atlas of Histology	Eroschenko	Lippincot Williams & Wilkins
Langman's Medical Embryology	Sadler T.W	Elsevier Churchill Livingstone
Human Embryology	Inderbir Singh	Jaypee Brothers
Human NeuroAnatomy	Inderbir Singh	Jaypee Brothers
Essentials of Anatomy: Neuroanatomy	Datta A.K	Current Books International
Elements of Medical Genetics; student notes	Emery (Alan H) and Muller (Robert F),	ELBS
Surface & Radiological Anatomy	Halim A	CBS Publishers

Recommended Books (Latest Editions)

Name of the book	Author	Publisher
GRAY'S Anatomy for students	Gray	Elsevier Churchill Livingstone
Text book of anatomy with colour Atlas, Vol. I, H, I"	Inderbir Singh	Jaypee Brothers
Clinically oriented Anatomy	Moore K. L.	Lippincot Williams & Wilkins
A Text book of Human Histology	Garg, K. And Bahl.l	CBS Publishers

Reference Books:

Name of the book	Author	Publisher
Gray's Anatomy	Gray	Elsevier Churchill Livingstone
Human Embryology	Datta A. K.	Current Books International
Netter's Atlas of Human Anatomy	Netters	ICON Learning Systems
Essentials of Human Genetics	Bhatnagar & Kothari	Kothari Medical Publishers
Development Anatomy	By Moore & Persaud.	
Histology; text and atlas, ed 3.	Ross (Michael.JD) et, al.,	Williams and Wilkins,
Basic Histology (Text & Atlas) 10 th Edition 2003	By Luis C.Junqueira Carneiro	Appleton and Lange
Wheater's Functional Histology 4 th Edition 2000	Edited by B,Young and J.Heath	Churchill Livingstone
Human Embryology 3 rd Edition 2001	William J. Larsen	Churchill Livingstone
Thompson & Thompson Genetics in Medicine 6 th Edition 2001 Revised reprint March 2004	Nussbaum, McInnes & Willard	W.B.Saunders & Co, Philadelphia, London
Essential Medical Genetics 5 th Edition 1997	J.M.Connor	M.A. Ferguson Smith Blackwell Scientific Publication
Human Neuroanatomy 9 th Edition 1996	Andre Parent, Malcolm B Carpenter	Williams and Wilkins
Clinical Neuroanatomy for Medical students 5 th Edition 2001	By Richard S.Snell	Lippincott, William & Wilkins
Clinical Neuroanatomy and related Neuroscience 4 th Edition 2002	By MJT Fitzgerald	WB Saunders and Co.
Text Book of Anatomy	Hollinshead	Harper & Row Publishers

PHYSIOLOGY

(a) Competencies:

The undergraduates must demonstrate:

1. Understanding of the normal functioning of the organs and organ systems of the body.
2. Comprehension of the normal structure and organization of the organs and systems on basis of the functions.
3. Understanding of age-related physiological changes in the organ functions that reflect normal growth and development.
4. Understand the physiological basis of diseases.

(b) Integration:

The teaching should be aligned and integrated horizontally and vertically in organ systems in order to provide a context in which normal function can be correlated both with structure and with the biological basis, its clinical features, diagnosis and therapy.

Physiology

****Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1**

GOAL:

The Goal of teaching Undergraduate students in Physiology is to make them understand the Physiological Principles and normal Homeostatic Mechanisms of normal Human body so that he/she can understand the Disease pattern better.

COURSE OUTCOME:

At the end of I MBBS Phase I, a medical student, in Physiology should be able to :

1. Elucidate the functions of organ systems in normal subject.
2. Explain the various regulatory mechanisms and their integration in maintenance of Homeostasis.
3. Describe the mechanism of altered physiology on exposure to stress.
4. Apply the principles of physiology in understanding disease process.
5. Compare the normal and abnormal data & interpret the same to assess health status.
6. Comprehend basics of Reproductive physiology as relevant to National Family Welfare Programme.
7. Perform basic laboratory investigations relevant for a rural setup.
8. Demonstrate compassionate approach while examining subjects.

COURSE CONTENTS :

PY 1.1- number of the competency as represented in the MCI curriculum booklet ** where first two alphabets PY represents subject Physiology and number following alphabet reflects topic number.

COMPETENCIES	CORE	NON CORE	HOURS
General Physiology (PY 1.1-1.9)			
Structure and functions of a mammalian cell; Principles of Homeostasis, Intercellular communication;	√		(8 hrs)
Apoptosis; Transport mechanisms across cell membranes;	√		
Fluid compartments of the body;	√		
pH & Buffer systems in the body; Evaluation of functions of the cells and products in	√		
Clinical care and research.	√		
Hematology: (PY 2.1 - 2.13) (16 hrs)			
Components of blood: formation, regulation and functions; plasma proteins – origin, types.	√		16 hrs
variations and functions; Hemoglobin- synthesis, variants,	√		
functions and its breakdown & Jaundice; Blood indices;	√	√	
Anemia and its classification; Hemostasis: mechanism,	√	√	
regulation & disorders Anticoagulants; Blood groups,	√		
blood banking and transfusion; Immunity: types,			
mechanism & regulation; ESR; Lymph-composition,			
circulation and functions. Autoimmune disorders.			
Nerve & Muscle Physiology: (PY 3.1 - 3.18) (10hrs)			
Neuron and neuroglia: structures, types, functions;			10 hrs
Resting membrane potential; Action.	√		
potential in nerve, skeletal & smooth muscle; Nerve fibres:	√		
classification, functions & properties; nerve injuries,	√		
degeneration and regeneration in peripheral nerve;	√		
Neuromuscular junction: structure, transmission of	√		
impulses, neuro-muscular blocking.	√		
agents, Myasthenia gravis; Muscle fibres: structure, types	√		
& functions; Muscle contraction;	√		
molecular basis (skeletal, smooth), Isotonic Vs. Isometric,	√		
Energy sources and metabolism,	√		
gradation of muscle activity; muscle dystrophy, Myopa-			
thies; Strength-duration curve			

COMPETENCIES	CORE	NON CORE	HOURS
Gastrointestinal Physiology: (PY 4.1 - 4.10) (10hrs)			10 hrs
Functional anatomy and broad functions of digestive system, enteric nervous system; GI .	√		
Secretions- composition, mechanism of secretion, functions, and regulation of saliva, gastric.	√		
pancreatic, intestinal juices and bile secretion; GI movements	√		
- types, regulation, functions.	√		
reflexes; role of dietary fibres; Digestion and absorption of nutrients; GI hormones- source, 67. Regulation, functions;	√	√	
Gut-brain axis; structure and functions of liver and gall bladder; gastric function tests, pancreatic exocrine function tests & liver function tests, Pathophysiology - Achalasia	√	√	
cardia, peptic ulcer, gastro oesophageal reflux disease, Vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease.	√	√	
Cardiovascular Physiology: (PY 5.1 - 5.16) (25hrs)			25 hrs
Functional anatomy of heart; Pacemaker tissue and conducting system-generation.	√		
conduction of cardiac impulse; Properties of cardiac muscle; Cardiac cycle; ECG- recording.	√		
normal ECG, uses, cardiac axis, Abnormal ECG in common arrhythmias, changes with	√		
hypertrophy & MI; Haemodynamics; Heart rate- factors affecting, regulation; Cardiac	√		
output- factors, regulation, measurement; Blood pressure- components, determinants,	√		
factors, regulation and applied aspect, Regional circulation- autoregulation, microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, fetal, pulmonary and splanchnic circulation; Pathophysiology- shock, syncope, heart failure & coronary artery disease	√		
Respiratory Physiology: (PY 6.1-6.10) (12hrs)			12 hrs
Functional anatomy of respiratory tract, dead space; Mechanics of respiration; Pressure volume changes during ventilation; Lung volume and capacities; Alveolar surface tension; Compliance; Airway resistance; alveolar ventilation, V/P ratio; Diffusion capacity of lungs; Transport of respiratory gases- Oxygen and Carbon dioxide; Neural and chemical regulation of respiration; Physiology of high altitude and deep sea diving; Principles of artificial respiration, oxygen therapy; Patho-physiology of dyspnoea, hypoxia, cyanosis, asphyxia, drowning, periodic breathing; Lung function tests & its clinical significance.	√	√	
	√	√	
		√	

COMPETENCIES	CORE	NON CORE	HOURS
Renal Physiology: (PY 7.1 - 7.9) (10hrs)	√		10 hrs
Structure and functions of kidney & juxta glomerular apparatus, role of renin-angiotensin system ; Renal blood flow; Mechanism of urine formation, concentration and diluting mechanism; Concept and significance of 'clearance' tests; Renal regulation of fluid and electrolytes & acid-base balance; Structure and innervation of urinary bladder, physiology of micturition, cytometry, and its abnormalities; Artificial kidney(dialysis) and renal transplantation; Renal Function Tests.	√ √ √ √ √ √ √ √ √		
Endocrine Physiology: (PY 8.1 - 8.6) (16 hrs)			
Mechanism of action of steroid, protein and amine hormones; 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;	√ √		
Physiology of bone and calcium metabolism; Physiology of growth; Physiology of Thymus	√ √	√ √	
& Pineal Gland; Hormone function tests ; Obesity & metabolic syndrome; Stress response	√	√	
Reproductive Physiology: (PY 9.1 - 9.12) (10hrs)			10 hrs
Sex determination; sex differentiation and their abnormalities; Puberty: onset, progression,	√		
stages; early and delayed puberty; Male reproductive system: functions of testis,	√ √		
spermatogenesis and its regulation, Cryptorchidism ;	√		
Female reproductive system:	√		
functions of ovary and its control, menstrual cycle:	√		
Hormonal, uterine and ovarian changes;	√		
Tests for ovulation; Physiological effects of sex hormones;	√		
Contraceptive methods for male and female; Effects of removal of gonads on physiological functions; Physiology of pregnancy, fetoplacental unit, pregnancy tests, parturition & lactation; Semen analysis;			
Causes and principles of management of infertility; Hormonal changes and their effects		√	
during perimenopause and menopause; Psychological and psychiatric disturbances associated with reproductive physiology.			

COMPETENCIES	CORE	NON CORE	HOURS
Neurophysiology: (PY 10.1 - 10.20) (37 hrs)			37hrs
Organization of nervous system; Sensory system: types, functions and properties of synapse, receptors, reflex; Somatic sensations & sensory tracts; Physiology of pain; Motor system: organization, motor tracts, mechanism of maintenance of tone, control of voluntary movements ; Posture and equilibrium & vestibular apparatus; Reticular activating system, Autonomic nervous system ; Spinal cord: functional organization and lesions ; Formation, circulation and function of CSF; Blood brain barrier; Neurotransmitters.	√		
Organization, connections and functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities; Higher mental functions ; Physiology of sleep, memory, learning and speech and their disorders; EEG.	√		
Special senses- Smell and taste sensation and their abnormalities; Functional anatomy of ear and auditory pathways & physiology of hearing, Deafness, hearing tests; Functional anatomy of eye, Image formation, Visual pathway and its lesions, Physiology of vision including acuity of vision, colour vision, field of vision, refractive errors, physiology of pupil; light reflex, accommodation reflex, dark and light adaptation; Auditory & visual evoked potentials	√		
Integrated Physiology: (PY 11.1 - 11.14) (6 hrs)			6 hrs
Temperature regulation: mechanism, adaptation to altered temperature (heat and cold environment), mechanism of fever, cold injuries and heat stroke; Exercise- cardiorespiratory and metabolic adjustments during exercise (isotonic and isometric), exercise in heat and cold, physical training effects; Physiological consequences of sedentary lifestyle; Brain death; Physiology of Infancy*; Physiology of aging-free radicals and antioxidants*; Physiology of meditation*.	√	√	

PRACTICALS:

The entire practical have been categorized as 'Procedures' and 'Demonstrations'. The procedures are to be performed by the students during practical classes to acquire skills. Some of these would be included in the practical during University examination. Those categorized as "Demonstrations" are to be shown to students during practical classes. However, these Demonstrations would not be included in the university examinations, but questions based on these would be given in the form of data, charts, problems and case – histories, for interpretation by students.

HAEMATOLOGY

CONTENTS	Skill tested
Compound Microscope	DOAP
Packed cell volume - Demonstration	Demonstration
Erythrocyte sedimentation rate - Demonstration	Demonstration
Estimation of Haemoglobin concentration	DOAP
Haemocytometer	DOAP
Total RBC count	DOAP
Reticulocyte count	Demonstration
Total Leucocyte count	DOAP
Osmotic fragility	Demonstration
Peripheral smear	DOAP
Differential Leucocyte count	DOAP
Absolute eosinophil count	DOAP
Determination of bleeding time	DOAP
Determination of clotting time	DOAP
Platelet count demonstration	Demonstration
Determination of blood groups	DOAP

HUMAN EXPERIMENTS

CONTENTS	Skill
Mossos's Ergograph	DOAP
Spirometry	DOAP
Demonstration of computerised spirometry	DOAP
Peak Flow Meter	DOAP
Demonstration of Electrocardiography	Demonstration
Anthropometry	DOAP
Demonstrate Harvard Step test	DOAP
Record Arterial pulse tracing using finger plethysmography	Demonstration
Clinical examination of radial pulse	DOAP
Measurement of Blood Pressure	DOAP
Effect of Posture on Blood Pressure	DOAP
Effect of exercise on pulse & Blood Pressure	DOAP
cardiovascular autonomic function tests	Demonstration
Demonstrate Basic Life Support in a simulated environment	Demonstration

CLINICAL EXAMINATION

CONTENTS	Skill
Clinical Examination of Cardiovascular System	DOAP
Clinical examination of Respiratory System	DOAP
Clinical examination of Sensory system	DOAP
Clinical examination of Motor system	DOAP
Clinical Examination of Reflexes	DOAP
Clinical Examination of Cranial Nerves	DOAP
Clinical Examination of Abdomen	DOAP

AMPHIBIAN EXPERIMENTS

CONTENTS	SKILL
Study of apparatus	Interpretation of graphs
Gastrocnemius muscle sciatic nerve preparation	Interpretation of graphs
Recording of simple muscle twitch (smt)	Interpretation of graphs
Effect of strength of stimuli	Interpretation of graphs
Effect of repeated stimuli - fatigue	Interpretation of graphs
Effect of temperature on muscle contraction emperature on muscle contraction	Interpretation of graphs
Velocity of nerve impulse	Interpretation of graphs
Effect of two successive stimuli	Interpretation of graphs
Genesis of tetanus	Interpretation of graphs
Effect of preload and after load on muscle contraction and work done by the muscle of preload and after load on muscle contraction and work done by the muscle	Interpretation of graphs
Normal cardiogram of frog	Interpretation of graphs
Effect of temperature on normal cardiogram of frog	Interpretation of graphs
Effect of stannius ligature	Interpretation of graphs
Properties of cardiac muscle – i	Interpretation of graphs
Properties of cardiac muscle – ii	Interpretation of graphs
Long refractory period	Interpretation of graphs
Effect of vagal stimulation	Interpretation of graphs
Effect of ions on isolated frog's heart	Interpretation of graphs
Effect of drugs on isolated frog's heart	Interpretation of graphs

Teaching Learning Methodology: Computer Assisted Learning

SKILL CERTIFICATION:**List and number of sessions for skill certification:**

	Topic	Number required to Certify as per MCI
PY5.12	Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment	1each x 3
PY6.9	Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment	1
PY 10.11	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	1 each (total 5)
PY 10.20	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	1 each (total 4)

****Learners must have completed the required certifiable competencies for that phase of training to be eligible for appearing at the final university examination of that subject.**

EARLY CLINICAL EXPOSURE:

*****Medical Council of India. Early Clinical Exposure for the Undergraduate Medical Education Training Program, 2019: pp 1-43.**

Clinical visits: 12 hours

Basic science correlations: 18 hours

Discussion based on case vignettes, graphs, clinical videos, patient in classroom setting, etc linked to various systems in physiology.

Topic	Setting
Anaemia	classroom
Anthropometry for nutritional Assessment	Hospital
Parkinson's signs & symptoms	classroom
Refractive errors	classroom
Renal Dialysis	Hospital
Cerebellar dysfunction	classroom
Thyroid Dysfunction	Hospital
Cognition & its Assessment	classroom
COPD	Hospital
Cushing's syndrome	classroom

Module on Pandemic Management August 2020

Phase I	1.1	Infection Control: Part - I Infection Control Practices – Hand washing, Decontamination Use of PPEs	4hours	Microbiology

Competencies to be addressed

The student should be able to:	Level
Demonstrate proper hand washing	SH
Demonstrate Donning and Doffing of PPE	SH

***ECE assessment should be included subject-wise

LOG BOOK:

Logbook helps the student in maintaining a record of:

- Foundation Course,
- Reflections on Early Clinical Exposure,
- Periodic assessment tests
- Certifiable skills
- Self-directed learning,
- Reflections of AETCOM module
- Feedback.

****Learners must update the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.**

1. Aligned and Integrated topics(AITO)

******Medical Council of India. Alignment and Integration Module for Undergraduate Medical Education Program, 2019: pp 1- 34**

- ♦ Anemia
- ♦ Jaundice
- ♦ Diabetes
- ♦ Thyroid Diseases
- ♦ Nutrition
- ♦ Febrile Illness
- ♦ Tuberculosis
- ♦ Malaria
- ♦ Diarrhoea
- ♦ Ischemic Heart Disease
- ♦ Polycystic Ovarian Syndrome

******Assessment for AITo will be subject based.**

AETCOM:

*******“Medical Council of India, Attitude, Ethics and Communication (AETCOM) Competencies” for the Indian Medical Graduate 2018**

First two modules of the AETCOM as prescribed in the MCI AETCOM booklet will be conducted as given below:

2. Module 1.1: What does it mean to be a doctor?

Competencies addressed:

The student should be able to:	Level
Enumerate and describe professional qualities and roles of a physician	KH
Describe and discuss the commitment to lifelong learning as an important part of physician growth	KH
Describe and discuss the role of a physician in health care system	KH
Identify and discuss physician’s role and responsibility to society and the community that she/ he serves	KH

3. Module 1.2: What does it mean to be a patient?

Competencies addressed

The student should be able to:	Level
Enumerate and describe professional qualities and roles of a physician	KH
Demonstrate empathy in patient encounters	SH

*****There should be at least one short question from AETCOM in each subject

TEACHING HOURS AND METHODS :

1. Total Number of Hrs : 525 :

Theory Didactic Lectures	160 Hrs.
SGT/practicals/tutorials/integrated learning	310 Hrs
SDL	25 Hrs.
Total	495 Hrs
Early clinical exposure	30 Hrs
Grand total	525 hrs

2. System wise distribution of Teaching Hours :

System	No. of Hrs.
General Physiology (PY 1.1-1.9)	08
Hematology: (PY 2.1 - 2.13) (16 hrs)	16
Nerve & Muscle Physiology: (PY 3.1 - 3.18) (10hrs)	10
Gastrointestinal Physiology: (PY 4.1 - 4.10) (10hrs)	10
Cardiovascular Physiology: (PY 5.1 - 5.16) (25hrs)	25
Respiratory Physiology: (PY 6.1-6.10) (12hrs)	12
Renal Physiology: (PY 7.1 - 7.9) (10hrs)	10
Endocrine Physiology: (PY 8.1 - 8.6) (16 hrs)	16
Reproductive Physiology: (PY 9.1 - 9.12) (10hrs)	10
Neurophysiology: (PY 10.1 - 10.20) (37 hrs)	37
Integrated Physiology: (PY 11.1 - 11.14) (6 hrs)	06

Classes may be coordinated and integrated with relevant departments on various topics as scheduled below.

3. TEACHING LEARNING METHODS:

- ♦ Didactic lectures
- ♦ Structured interactive sessions
- ♦ Small group discussion
- ♦ Team Based learning
- ♦ Problem based learning
- ♦ Focused group discussion (FGD) for Poor performers
- ♦ Practical including demonstrations
- ♦ Problem based exercises.
- ♦ Computer assisted learning
- ♦ Written case scenario
- ♦ Self-directed learning
- ♦ Integrated teaching at horizontal & vertical levels
- ♦ E-modules

4. METHODS OF ASSESSMENT:

- ♦ Modified essay question
- ♦ Short notes questions.
- ♦ MCQs
- ♦ Problem solving exercises
- ♦ OSPE
- ♦ OSCE
- ♦ Open Book tests
- ♦ Readiness Assessment test
- ♦ Records Review
- ♦ Microscopic examination
- ♦ Quiz
- ♦ Assignment
- ♦ Oral Viva Voce

5. LEARNING RESOURCE MATERIALS:

- ♦ Text books
- ♦ Reference books
- ♦ Practical note books
- ♦ Internet resources
- ♦ Video films etc.

6. LIST OF e-MODULES:

- ♦ Action potentials of nerve, muscle
- ♦ Transport across cell membrane
- ♦ Types of blood cells
- ♦ Transmission across neuromuscular junction
- ♦ Conduction system of heart
- ♦ ECG : Normal and abnormal

SCHEME OF EXAMINATION

******Medical Council of India. Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019: pp 1-30.**

Eligibility to appear for university examinations:

A) Attendance:

Attendance requirements are 75% in theory and 80% in practical for eligibility to appear for the university examinations

B) Internal assessment:

Student must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in Physiology in order to be eligible for appearing at the final University examination.

3 internal assessments will be conducted with 100 marks for theory and 100 marks for practicals.

Theory: 100 Marks

Type of Questions	Number of questions	Marks for each question	Total
Long Essay	02	10	20
Short Essay	06	05	30
Short Answer	10	03	30
		Total	80
MCQ's	20	01	20
Total IA marks			100

Note:

- ◆ Case based questions will be included in the internal assessment.
- ◆ The third internal assessment is the prelim examination which will be conducted on the lines of the university examination.
- ◆ Internal assessment will include questions from Early Clinical exposure, AITO, AETCOM.
- ◆ Continuous assessments in the form of seminars, periodic assessment tests and part completion tests will be conducted at regular intervals.

Please note:

- ◆ Final Internal assessment marks submitted to the university will be 100 marks for theory and 100 marks for Practicals.

Scheme for calculation of final internal assessment marks:

Theory	Marks	Practicals	Marks
		Practicals (OSPE/OSCE)	60
Theory written paper (Including LEQ, SEQ & SAQ)	60	Viva	10
Formative Assessment (Quiz, PAT, PCT)	20	Logbook +record	20
MCQ	10	Professionalism	05
Seminar	10	AETCOM	05
Total	100		100

Average of the three internal assessment marks is taken into consideration for calculating the final marks for theory written paper and reduced to 60 while calculating final internal assessment marks to be sent to University. Likewise average of marks obtained in MCQs during the 3 internal assessments is reduced to 10. Similarly Average of Marks obtained by continuous Assessment tests like Quiz, PAT, PCT will be reduced to 20 and marks obtained for seminars is reduced to 10 which adds up to 100 marks will be sent as final theory internal assessment marks to University.

Practicals: 100 Marks

Three practical assessments in the form of OSPE and OSCE for 80 marks will be conducted along with viva for 20 marks. Average of best of three OSPE/OSCE marks will be taken and reduced to 60 for calculation of final assessment marks to be sent to University. Similarly average of viva marks is reduced to 10. Record maintenance & logbook will be assessed for 20 marks, Professionalism for 5 marks and AETCOM separately for 5 marks which adds up to 100 marks will be sent as final practical internal assessment marks to University.

Certifiable skills: will be evaluated as per checklist & certificate of accomplishment is awarded which is mandatory to take-up university exam. This will be assessed in log book.

University examination

Theory : 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be of three types.

Note:

Type of Questions	Number of questions	Marks for each question	Total
MCQ's	20	01	20
Long Essay	02	10	20
Short Essay	06	05	30
Short Answer	10	03	30
Total marks			100

- ◆ Distribution of chapters and suggested marks in parenthesis for Paper I and Paper II in Physiology for University examination are as follows
- ◆ Case based questions will be included in the university examination both in theory and MCQ's.

Paper-I

General Physiology (5) Blood (20), cardiovascular system (25), Respiratory system (20), gastrointestinal system (15), renal system (15).

Paper-II

Endocrine (30), Special senses (15), Reproduction (10), Central Nervous System (30), Nerve & muscle physiology (10), Integrated Physiology (5)

*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

Practical: 80 Marks

There shall be two practical sessions, Practical I and II, each carrying 40 marks, each practical will be of 2 hrs, duration. The distribution of content and marks for the practical would be:

Practical I:OSCE	40 marks
Clinical:	
CVS/Per	10 marks
Abdomen RS	10 marks
CNS/special senses	10 marks
Human experiments:	10 marks
Practical II:(OSPE)	40 marks
Hematology	20 marks
Amphibian	10 marks
Cases/problems	10 marks

Viva-Voce Examination: 20 Marks

The viva-voce examination shall carry 20 marks and all examiners will conduct the examination.

Portions of Paper I	10 Marks
Portions of Paper II	10 Marks

SCHEME OF MARKS DISTRIBUTION

University Examination:	
Theory	
Paper – I	100
Paper – II	100
University Examination :	
Practical	80
Vivavoce	20
Internal Assessment	
Theory	100
Practical/viva	100

Criteria for passing university examination

- ♦ The student must **secure at least 40% marks in each of the two theory papers** with **minimum 50% of marks in aggregate** (both papers together) to pass.
- ♦ The marks obtained in the viva examination will be added to the practical marks.
- ♦ The student **must secure a minimum of 50% of marks in aggregate in the viva and practical examination** (both combined) to pass.
- ♦ Student must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a Physiology in order to be eligible for appearing at the final University examination.

Internal assessment marks will reflect as a separate head of passing at the summative examination and will not be added to the university marks.

- ♦ A **maximum number of four permissible attempts** would be available to clear the first Professional University examination, whereby the **first Professional course** will have to be **cleared within 4 years of admission** to the said course. Partial attendance at any University examination shall be counted as an availed attempt.
- ♦ There shall be **one main examination** in an academic year and a **supplementary** to be held **not later than 90 days** after the declaration of the results of the main examination.

RECOMMENDED TEXT BOOKS AND REFERENCE BOOKS

The list of books under the section Reference books are categorized under three levels of difficulty – level one being the easiest. The books under level one are meant to provide an overall. Simple but comprehensive account of physiology. Books at level two can be considered as alternative textbooks and some of them are excellent books for further reading. Level three books are really meant for purposes of reference during advanced study in any special area of Physiology.

Reference Books:

Recommended Books (Latest Editions):

Title

GUYTON (Arthur C), Text of Medical Physiology. Recent edn., Prism Publishers, Bangalore.

GANONG (William F), Review of Medical Physiology, Recent edn., Appleton and Lange.

Essentials of Medical Physiology Paperback – 2014 by A.B.S. Mahapatra (Author)

Textbook of Medical Physiology, 2e [Print Replica] Kindle Edition by Venkatesh D., Sudhakar H.H. (Author)

Comprehensive Textbook Of Medical Physiology by G K Pal, Pravati Pal, et al. | 1 January 2019 VANDER et al. Human Physiology, recent edn.

Chatterjee's Human Physiol 11E V1 Paperback – 31 Jan 2016 by C.C.Chatterjee (Author)

CHAUDHURI (Sujith K), Concise Medical Physiology, New Central Books, Calcutta.

Textbook of Physiology (Set of 2 Volumes) (2018-19 Session) Paperback – 2019 by A K Jain (Author)

Textbook of Medical Physiology by Elsevier India; 2 edition by Indu Khurana and Aarushi Khurana.

Practical Physiology:

There is no one text book on experimental physiology and that may be recommended with impunity. However, there is certainly no need for an undergraduate medical student to invest in one. Some useful books to refer to are:

Ghai . A textbook of practical physiology

McLeod, Clinical Examination

Hutchison & Hunter, Clinical Methods

AK Jain- manual of practical physiology

PravathiPal- Manual of practical Physiology

Chatterjee's Manual of practical physiology

BIOCHEMISTRY

The course will comprise Molecular and Cellular Biochemistry.

a)Competencies:

The learner must demonstrate an understanding of:

1. Biochemical and molecular processes involved in health and disease,
2. Importance of nutrition in health and disease,
3. Biochemical basis and rationale of clinical laboratory tests, and demonstrate ability to interpret these in the clinical context.

b)Integration:

The teaching/learning programme should be integrated horizontally and vertically, as much as possible, to enable learners to make clinical correlations and to acquire an understanding of the cellular and molecular basis of health and disease.

Biochemistry

GOALS & OBJECTIVES

Teaching & Application in the subject of Biochemistry including Medical Physics, Clinical Biochemistry and Molecular Biology

i) Goals

The broad goal of teaching for undergraduate students in Biochemistry is to make them understand the scientific basis of life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems. Towards this, the department would facilitate:

1. To enable students understand the scientific basis of life processes at the molecular level and orient them towards the application of knowledge acquired in solving clinical problems.
2. To enable the students to acquire basic practical skills for biochemical investigations in order to support clinical diagnosis of common disorders in the community.
3. To orient the students towards the biochemical basis of common diseases, and
4. To promote research activities for students.

ii) Objectives

a) Knowledge

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

1. Describe the molecular and functional organization of a cell and its subcellular components
2. Delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal
3. Summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered
4. Describe digestion and assimilation of nutrients and consequences of malnutrition
5. Integrate the various aspects of metabolism and their regulatory pathways
6. Explain the biochemical basis of inherited disorders with their associated sequel
7. Describe mechanisms involved in maintenance of body fluid and pH homeostasis
8. Outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine
9. Summarize the molecular concepts of body defense and their application in medicine;
10. Outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis
11. Familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data
12. Suggest laboratory investigations to support theoretical concepts and clinical diagnosis.

b) Skills

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

Acquire skills required to consider relevant biochemical investigations for common clinical conditions & its interpretation.

c) Integration

Integrate all three preclinical subjects in teaching- learning and evaluation for better understanding of the subject and its correlation.

COURSE CONTENT AND TEACHING HOURS

A. TEACHING HOURS

TOTAL: 250 HOURS

Teaching learning method	No. of Hours
Large group teaching	80
Small group teaching (SGT) (Small group discussions SGD/ Tutorials/Seminars/ Case based learning sessions/ Integrated teaching sessions/ Practical)	150
Self-directed learning (SDL)	20
Total	250
Early Clinical Exposure	30

Knowledge

Topics with competency	No. of Teaching Hours	Core	Non-core
1. Cell and organelles, Cell membrane, Transport across cell membranes (BI1.1) Molecular and functional organization of a cell and its subcellular components. Definition of cell, Difference between prokaryotic and eukaryotic cell Composition and functions of cell Structure and Functions of different cell organelles such as Cell membrane, Nucleus, Cytoplasm, Mitochondria, Endoplasmic reticulum Ribosomes, Lysosomes, , Golgi apparatus, Peroxisomes Describe Plasma membrane structure with composition and function of membranes Discuss the Transport across the biological membrane Know Cell Fractionation, and Differential Centrifugation Know Marker Enzymes for different cell organelle	03	Y	Y
2. Chemistry of Proteins (BI 5.1, BI 5.2) General structure of amino acids Classification of amino acids with examples General properties of amino acids Peptide bond formation with characteristic features Biologically important peptides with their function Classification of proteins Physical & chemical properties of Proteins Structural organization of proteins: Primary, secondary, tertiary & quaternary structure with forces stabilizing each structure, salient features, examples, significance structure-function relationships in relevant areas eg, hemoglobin and Methods employed in determining the protein structure Denaturation & renaturation of proteins with significance Non protein amino acids, Non alpha amino acids, D-amino acids	06	Y	Y
3. Chemistry of Carbohydrates (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 Definition Carbohydrates & Mention the Biomedical importance of Carbohydrates Classification of Carbohydrates with suitable examples. The differences between monosaccharides, di-saccharides and polysaccharides with examples. Isomerism, stereoisomers, enantiomers, Dia-stereoisomers, D and L isomers, optical isomerism Mutarotation & the mechanism for Mutarotation. Chemical properties of carbohydrates such as tautomerisation, enediol formation, osazones formation. Glycosides with examples & mention their biomedical importance Polysaccharide & describe Homo & Heteropolysaccharides with examples. Proteoglycans and Glycoproteins with their Biomedical importance.	05	Y	

Topics with competency	No. of Teaching Hours	Core	Non-core

4. Chemistry of Lipids (BI4.1, BI11.24)			

Definition, Modified Bloor's classification with examples.

Biomedical importance of lipids Fatty acids- Definition, examples and importance of Essential fatty acids, Mono and Polyunsaturated fatty acids, ω 3 and n6 fatty acids, Trans fatty acids. Triacylglycerol composition and importance Phospholipids - Types, functions with clinical importance Respiratory distress syndrome Glycolipids - Types and importance Cholesterol - structure and biological importance Lipoproteins - Types and functions Amphipathic lipids Definition, examples and importance, Liposomes

05

Y

5. Enzymes ((BI2.1, BI2.3, BI2.4, BI2.5, BI2.6, BI2.7)			

Enzymes- Definition, General properties, IUBMB Classification.

Coenzymes and Cofactors Mechanism of Enzyme action - Concept of activation energy, transition state, binding energy, active site; Substrate binding to active site, Koshland's Induced fit theory Factors affecting enzyme activity -Effect of substrate concentration -Michaelis Menton theory, Km value, Vmax and its significance (derivation not required) Enzyme specificity

Enzyme inhibition-Competitive and Noncompetitive inhibition with examples of clinical importance Suicide inhibition

Enzymes as toxins Eg. Snake venom phospholipase

Enzyme regulation by

Short term (Covalent modification, Zymogen activation, Allosteric regulation, Feedback regulation)

and long term regulation (Induction and repression)

Clinical Enzymology - Concept of plasma functional and non-functional enzymes Diagnostic Importance of enzymes - LDH, CK, AST, ALT, ALP, GGT, Amylase, Lipase, G6PD, Cholinesterase, ACP, 5'nucleotidase Isoenzymes -Definition, Diagnostic

Importance of isoenzymes with examples. Enzymes as

Therapeutic agents Enzymes used in diagnostic assays Ribozymes

08

Y

Topics with competency	No. of Teaching Hours	Core	Non-core
6. Heme metabolism (BI6.11, BI6.12, BI5.2, BI11.17) Heme –Outline of Synthesis, porphyrias Degradation of Heme, Bilirubin metabolism – synthesis, transport, conjugation, excretion Jaundice – definition, types, causes, lab diagnosis Congenital hyperbilirubinemias Hemoglobin – Adult, fetal and embryonic types Abnormal hemoglobins– carboxy, sulph, methHb. Hemoglobinopathies -molecular defects, pathophysiological changes in thalassemias and sickle cell anemia	6	Y	
7. Extracellular matrix (BI9.1, BI9.2) Composition of ECM – Proteins (Composition and functions of Collagen, elastin, fibrillin, fibronectin, laminin) and Proteoglycans. Involvement of ECM components in health and disease. Eg. Osteogenesis Imperfecta, Ehler Danlos syndrome etc	4	Y	
8. Chemistry of Nucleic acids (BI7.1) Primary and secondary structure of DNA Structural forms (polymorphism) of DNA Specificity of the pairing of bases and Chargaff's rule, structure and Functions of RNA Differences between DNA and RNA	4	Y	
9. Acid-Base balance (BI6.7, 6.8) Concept of Acids, Bases and buffers, HH Equation and its application Regulation of pH of blood by buffers, respiratory and renal mechanisms Anion gap and its significance Acidosis and alkalosis (metabolic and respiratory) causes, compensatory mechanisms and lab findings	6	Y	
10. Immunology (BI10.3, BI10.4, BI10.5) Cellular and humoral components of immune system Immunoglobulin -Classes, structure function relationship Innate and adaptive immune responses, self/non self-recognition Role of T-helper cells in immune responses Ig class switching Concept of Immune tolerance and Autoimmunity Antigens and concepts in vaccine development – types of vaccines, immunological basis of vaccine development, recombinant DNA technology in vaccine development. Phases of vaccine development.	4	Y	Y

Topics with competency	No. of Teaching Hours	Core	Non-core
11. Vitamins (BI6.5) Definition, difference between water and fat soluble vitamins RDA, Sources, Metabolism, Biochemical functions, Deficiency manifestations, Hypervitaminoses of Fat soluble vitamins (A,D,E,K), Water soluble vitamins Vitamin C, Folic acid, Vitamin B12, Thiamine, riboflavin, Niacin, Pyridoxine, Biotin, Pantothenic acid Antivitamins	12	Y	
12. Minerals (BI6.9, BI6.10) Major elements and trace elements Sources, RDA, absorption and transport, Homeostasis, Functions, Biological reference range, disorders associated with – Calcium, phosphorus, Iron Functions and disorders associated with Copper, Zinc, Selenium, Fluoride, Iodine, Magnesium, Molybdenum.	6	Y	
13. Biological Oxidation (BI6.6) High Energy Compounds – Definition, Classification, biological significance. Transport of reducing equivalents across mitochondria Electron Transport Chain Organization, components, flow of electrons. Oxidative Phosphorylation – Sites, mechanism (Chemiosmotic theory). Binding change mechanism of ATP synthesis by ATP synthase. Inhibitors of Electron Transport Chain and oxidative phosphorylation. Uncouplers and their significance. Brown adipose tissue metabolism. ATP-ADP cycle. Structure and organization of ATP synthase complex. Mitochondrial myopathies	6	Y	
14. Carbohydrate Metabolism Digestion and absorption Mechanism of absorption Lactose intolerance Glucose transporters Insulin dependent and Insulin independent uptake of glucose by tissues PATHWAYS – Significance, Site, reactions, key steps, energetics, regulation, inhibitors and associated disorders of - Glycolysis, Rapaport Leubering cycle and its significance Citric acid cycle, Amphibolic role, Anaplerotic reactions - Gluconeogenesis, Cori's cycle - Glycogenesis, Glycogenolysis, Glycogen storage disorders Significance of HMP shunt pathway and uronic acid pathway - Glucose-6-Phosphate dehydrogenase deficiency Galactosemia, Essential Fructosuria, Hereditary fructose intolerance Regulation of blood glucose levels in well fed condition and fasting/starvation - Galactose and Fructose metabolism Details of Pyruvate dehydrogenase (PDH) reaction	14	Y	

Topics with competency	No. of Teaching Hours	Core	Non-core
15. Lipid metabolism (BI4.2, BI4.3, BI4.4, BI4.6) Digestion and Absorption -Steatorrhea Biosynthesis and breakdown of triacylglycerol PATHWAYS – Significance, Site, reactions, key steps, energetics, regulation, and associated disorders of • Beta oxidation • Fatty acid synthesis-Fatty acid synthase multienzyme complex • Ketogenesis, ketolysis • Cholesterol biosynthesis upto mevalonate. • Other types of Oxidation of fatty acids and associated disorders • Lipoprotein metabolism Structure, Composition, Types, Functions, metabolism of Chylomicrons, VLDL, LDL, HDL Formation and functions of bile acids and bile salts Fatty liver and lipotropic factors • Hyperlipoproteinemias Biochemical basis of use of hypolipidemic drugs Prostaglandins – types and biomedical importance	11	Y	Y
Lipid Storage Disorders			
16. Protein and amino acid metabolism (BI5.3, BI5.4, BI5.5, BI11.17) Digestion and absorption and associated disorders Amino acid pool General reactions – Transamination, Transmethylation, Transdeamination, Deamination, Oxidative and nonoxidative and their significance. Biogenic amines Sources and fate of ammonia, Trapping, Transport and Disposal of ammonia, ammonia toxicity Urea cycle and its disorders. Amino acid metabolism Glycine – specialized products and their importance Phenylalanine, Tyrosine – metabolic pathway, synthesis of catecholamines. Pheochromocytoma Other specialised products formed from tyrosine and their importance Tryptophan synthesis of serotonin and melatonin and their importance Carcinoid syndrome Sulphur containing amino acids – functions of cysteine, methionine synthesis of SAM, SAH, defects, clinical features, laboratory diagnosis and biochemical basis of management of – PKU, Tyrosinosis, Alkaptonuria, Albinism, Homocystinuria, Maple syrup urine disease (MSUD) Important functions/products from histidine, serine, Aspartate, Asparagine, glutamate, glutamine, serine, branched chain amino acids Polyamines Examples and importance	12	Y	

Topics with competency	No. of Teaching Hours	Core	Non-core
17. Metabolism and homeostasis (BI6.1, BI3.8, BI4.5, BI4.7, BI3.10, BI11.17) Metabolic processes taking place in specific organs in the body in fed, fasting and exercise states. Metabolic changes during starvation Adipose tissue – Hormones Secreted from adipose tissue (adipokines – leptin, adiponectin) their functions and role in hunger and satiety. Diabetes mellitus – types, metabolic changes, complications. Guidelines for diagnosis of Diabetes mellitus Artificial sweeteners list, use, metabolic effects (briefly) and concerns (to be discussed within context of their use in Diabetes Mellitus). Lipid profile, Dyslipidemia Atherosclerosis-definition, role of lipids in atherogenesis (LDL, Oxidised LDL, Lp(a), Small dense LDL, HDL) Lab tests in Myocardial infarction	5	Y	
18. Nucleotide metabolism (BI6.2, BI6.3, BI6.4) Salvage pathways of Purine and pyrimidine synthesis Catabolism of Purines, Uric acid and its importance Etiology, manifestations and biochemical basis of clinical manifestations of – Gout, Lesch Nyhan syndrome SCID, Oroticaciduria Diagnostic importance of Adenosine deaminase	5	Y	
19. Nutrition and dietetics (BI8.1, BI8.2, BI8.3, BI8.4, BI8.5, BI11.17, BI11.23, BI11.24) Energy content of food items BMR – Definition, Normal values, Factors affecting and Biomedical importance SDA – Definition and significance (Thermogenic effect of food) Nitrogen balance Balanced diet definition, composition Dietary fibers definition, examples, importance Glycemic index – definition, calculation, importance Nutritional importance of Carbohydrates, Lipids, Proteins, Vitamins and minerals, commonly used food items including fruits and vegetables. Nutritional indices, Calculation of calorie requirement Dietary advice for optimal health in childhood and adults, special conditions like diabetes, coronary artery disease, pregnancy. Types, causes and effects of Protein energy malnutrition Obesity – Definition, BMI, types, causes, role of GI peptides and adipokines in obesity, associated health risks (eg., metabolic syndrome)	6	Y	
20. Plasma proteins (BI5.2) Functions and clinical significance of plasma proteins Albumin, β and γ globulins. Acute phase reactants Positive and Negative (clinical significance) Biological Reference range of serum total protein, albumin, total globulin, C reactive protein Multiple Myeloma	2	Y	

Topics with competency	No. of Teaching Hours	Core	Non-core
21. Organ function tests (BI6.13, BI6.14, BI6.15, BI11.17) Functions of Liver, Kidney, Thyroid and adrenals. Liver Function Tests: Tests based on Synthetic, Excretory, and Role of enzymes in hepatic dysfunction Renal Function tests – Tests to assess glomerular and tubular functions Thyroid function tests Adrenal function tests	4	Y	
22. Molecular Biology (BI7.1, BI7.2, BI7.3, BI9.3) Concept of Genomics, proteomics and metabolomics DNA Metabolism Cell cycle DNA replication prokaryotic and eukaryotic replication, requirements, process, inhibitors Telomere, Telomerase and its importance DNA repair mechanisms Diseases associated with DNA repair – Eg. Xeroderma Pigmentosum Mutations, causes, types of mutation, Consequences with examples RNA Metabolism -Transcription process Transcriptional units, promoter regions, RNA polymerases in prokaryotes and eukaryotes Differences between prokaryotic and Eukaryotic transcription Inhibitors of transcription process Post transcriptional modifications of all types of RNA Protein Biosynthesis -Genetic Code and its characteristics Requirements and activation of amino acids Translation in Eukaryotes Inhibitors of Translation Post translational modifications, Protein folding –Role of Chaperones and Heat shock proteins, Regulation of Gene expression, Gene, introns, exons, cistron Regulation of gene expression in prokaryotes with illustration of Lac Operon Regulation of gene Expression in eukaryotes – Role of enhancers, repressors, DNA regulatory elements, gene amplification, gene rearrangement, RNA processing, RNA editing, mRNA stability. Role of transcriptional activators and co-regulators Alzheimers disease, Prion diseases Protein targeting and sorting with associated disorders Eg, I cell disease Epigenetics	10	Y	Y
23. Molecular biology techniques and Gene therapy (BI7.4) Recombinant DNA technology, Hybridoma technology, DNA cloning process and application PCR technique and its Application Blotting techniques -Concept, types and application of gene therapy. DNA Polymorphism, SNP, VNTR, RFLP DNA genomic and cDNA libraries -DNA Probes DNA Microarrays Overview of Human Genome Project HGP, Monoclonal antibodies and their application.	3	Y	

Topics with competency	No. of Teaching Hours	Core	Non-core
24. Biochemistry of Cancer (BI10.1, BI10.2) Cell cycle, regulation, abnormal cell growth, programmed cell death (apoptosis) Mutagens and carcinogens: Definitions, examples and their actions in carcinogenesis Protooncogenes and their activation, oncogenes, tumour suppressor genes and their role in development of cancer Oncogenic viruses (HPV and cervical cancer) Growth factors and their receptors Tumour markers and their importance in diagnosis and prognosis of cancer Biochemical basis of cancer therapy – alkylating agents, antimetabolites, topoisomerase inhibitors, antibiotics, hormones, receptor blockers, radiotherapy etc Estrogen and Progesterone receptors and their clinical importance in breast cancer	4	Y	Y
25. Endocrinology Mechanism of action of Group I and Group II hormones Cell signalling (action of hormones and growth factors)	3	Y	
26. Water and electrolyte balance (BI6.7) Distribution of water and electrolytes in ICF and ECF Osmolality of ECF Regulation of water and electrolyte balance Disorders of electrolyte imbalance – causes and clinical features of Hyperkalemia, Hypokalemia, Hyponatremia, Hyponatremia, Dehydration	2	Y	
27. Free Radicals and Antioxidants (BI7.6, BI7.7) Free radicals, Reactive oxygen species (ROS), Reactive nitrogen species (RNS) Damaging effects of ROS on biomolecules, lipid peroxidation Anti-oxidant defence system of our body – enzymes, vitamins, metabolites as antioxidants Role of oxidative stress in atherosclerosis, diabetes mellitus and cancer	2	Y	
28. Xenobiotics and Detoxification (BI7.5) Xenobiotics and disease caused. Biotransformation Phase –I reactions Oxidation Hydroxylation Cytochrome P450 Phase- II reactions Conjugation reactions, Glucuronic acid, Glutathione, Glycine	2	Y	

Skills

PRACTICAL: 35X2 = 70 hours

Part 1: Qualitative Experiments – 9X2=18hrs

Part 2: Quantitative Experiments – 14X2=28hrs

Part 3: Demonstration Experiments – 12X2=24hrs

Type of Experiment	Suggested Teaching learning method Practical tests to be performed	No. of practical classes	Domain/ Level	Assessment method
Part 1: Qualitative Experiments -9 Classes				
Analysis of Normal constituents of urine BI11.3, BI11.4	constituents of urine BI11.3, BI11.4 DOAP sessions – Examine Physical properties, Inorganic constituents (Calcium, Phosphorus and Ammonia) and Organic constituents (Urobilinogen, Urea, Uric acid and Creatinine)	3	S/P	Qualitative analysis
Analysis of Pathological Constituents of Urine BI11.4, BI11.20	DOAP sessions - Physical examination, chemical tests for Glucose, Ketone Bodies, Blood, Proteins, Bile salts and Bile Pigments Demonstration by using Dip sticks	4	S/P	Qualitative analysis
Urine screening tests for Inborn errors of metabolism BI11.5, BI5.5	Newborn screening tests-Interpretation of laboratory reports	1	K/KH	OSPE/Viva
Calculate the energy content of food items 11.23	Small group discussion – Calculate	1	K/KH	OSPE/Viva
Part 2: Quantitative Experiments - 14 Classes				
Estimation of plasma glucose by Enzymatic method and Glucometer as point of care testing BI11.21, BI3.10	DOAP sessions -Perform and Interpret	2	S/P	Quantitative analysis
Estimation of serum and urine creatinine by Jaffe's method, Creatinine clearance BI11.7, BI11.21	DOAP sessions - Perform and Interpret	2	S/P	Quantitative analysis
Estimation of blood urea by Urease/ GLDH method BI11.21	DOAP sessions - Perform and Interpret	2	S/P	Quantitative analysis
Estimation of Total Protein and Albumin in serum by Biuret and BCG method, A:G ratio BI11.8, BI11.21	DOAP sessions -Perform and Interpret	2	S/P	Quantitative analysis

Estimation of Total cholesterol and High Density lipoprotein(HDL) cholesterol BI11.9	Practical - Perform and Interpret	1	S/P	Quantitative analysis
Estimation of Triacylglycerols BI11.10	Practical - Perform and Interpret	1	S/P	Quantitative analysis
Estimation of Calcium and Phosphorous BI11.11	Practical - Perform and Interpret	1	S/P	Quantitative analysis
Estimation of Serum Bilirubin BI11.12	Practical - Perform and Interpret	1	S/P	Quantitative analysis
Estimation of AST, ALT activity BI11.13	Practical - Perform and Interpret	1	S/P	Quantitative analysis
Estimation of ALP activity BI11.14	Practical - Perform and Interpret	1	S/P	Quantitative analysis

Part 3: Demonstrations -12 Classes

Lab safety and Biomedical waste disposal, Commonly used lab equipment, glassware and reagents BI11.1	small group discussion, lab visit	1	K/KH	Viva
Preparation of buffers and estimation of pH using pH meter BI11.2, 11.16, 11.19	Demonstration-Observe	1	K/KH	Viva
Colorimetry, Spectrophotometry BI11.6, BI11.18,	Demonstration-Observe	1	K/KH	Viva
Clinical chemistry autoanalyser and quality Control (Internal and External quality control, Precision, Accuracy, QC rules), Biological reference intervals BI11.16, BI11.19	Demonstration-Observe and interpret	1	K/KH	OSPE/ Viva
Specimen collection and preanalytical errors in clinical Biochemistry lab	Collection Centre and lab visit	1	K/KH	Viva
Serum protein electrophoresis, types and applications BI11.16, BI11.19	Demonstration-Observe and interpret	1	K/KH	OSPE/ Viva
Paper chromatography/TLC of amino acids/ars, types and applications BI11.5, BI5.5, BI11.16, BI11.19	Demonstration-Observe and interpret	1	K/KH	OSPE/ Viva
Analysis of CSF BI11.15	Small group discussion - Interpret	1	K/KH	OSPE/ Viva
Estimation of serum electrolytes by ISE BI11.16, BI11.19	Demonstration-Observe and Interpret	1	K/KH	OSPE/ Viva

Estimation of serum electrolytes by ISE BI11.16, BI11.19	Demonstration-Observe and interpret	In-	1	K/KH	OSPE/ Viva
Blood gas analysis using ABG analyser BI11.16, BI11.19	Demonstration-Observe and interpret	In-	1	K/KH	OSPE/ Viva
Principle, procedure and applications of ELISA, protein extraction, Blotting techniques, PAGE BI11.16, BI11.19	applica- Demonstration-Observe		1	K/KH	Viva
Principle, procedure and applications of PCR, DNA isolation BI11.16, BI11.19	applica- Demonstration-Observe		1	K/KH	Viva

Certifiable Skills

Competency Number & Certifications	Topic
BI11.4	Perform urine analysis to estimate and determine normal constituents.
BI11.4	Perform urine analysis to estimate and determine abnormal constituents.
BI11.20	Identify abnormal constituents in urine, interpret the findings and correlate these with pathological states.
BI11.21	Demonstrate estimation of glucose
BI11.21	Demonstrate estimation of urea
BI11.7/ BI11.21	Demonstrate estimation of serum creatinine and creatinine clearance
BI11.8/BI11.21	Demonstrate estimation of serum total proteins, albumin & A:G ratio

Early Clinical Exposure – 30 hrs

Classroom teaching- 18 hours

1. Orientation to the Clinical Biochemistry Laboratory
2. Application of therapeutic and diagnostic enzymes in the medicine.
3. Biochemical basis of myocardial infarction (dyslipidemia, atherosclerosis, diagnostic tests)
4. Vitamin deficiency disorders
5. Biochemical changes in acid base disorders
6. Inborn Errors of Metabolism

Hospital/Lab Setting –12 hours

1. Diabetes Mellitus
2. Orientation to Molecular Biology techniques- Visit to cell biology and molecular genomics laboratory
3. Venipuncture
4. Biochemical changes in Chronic Renal Failure

TEACHING LEARNING METHODS

Structured Interactive sessions, Tutorials, Small Group Discussions, Seminars, Projects, Self-Learning modules and e-modules etc.

SUGGESTED TOPICS FOR e- LEARNING MODULES

- a. Mechanism of action of enzymes
- b. Oxygen and CO₂ (Transport of gases by Hemoglobin)
- c. Genetic Mechanisms
 - i. Organization of the Genome
 - ii. Replication
 - iii. Transcription
 - iv. Translation
 - v. Mutations and repair – Inherited diseases of metabolism
 - vi. Recombinant DNA technology
- d. Lipoproteins in Atherosclerosis
- e. Automation in a Clinical Biochemistry laboratory
- f. Principles of Immuno Diagnostic Tests and their interpretation.

SCHEME OF EXAMINATION

*****Medical Council of India. Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019: pp 1-30.

Eligibility to appear for university examinations:

A) Attendance:

Attendance requirements are 75% in theory and 80% in practical for eligibility to appear for the university examinations

B) Internal assessment:

Student must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in Biochemistry in order to be eligible for appearing at the final University examination.

3 internal assessments will be conducted with 100 marks for theory and 100 marks for practicals.

Theory: 100 Marks

Type of Questions	Number of questions	Marks for each question	Total
Long Essay	02	10	20
Short Essay	06	05	30
Short Answer	10	03	30
		Total	80
MCQ's	20	01	20
Total IA marks			100

Note:

- ◆ Case based questions will be included in the internal assessment.
- ◆ The third internal assessment is the prelim examination which will be conducted on the lines of the university examination.
- ◆ Internal assessment will include questions from Early Clinical exposure, AITO, AETCOM
- ◆ Continuous assessments in the form of seminars, periodic assessment tests and part completion tests will be conducted at regular intervals.

Please note:

- ◆ Final Internal assessment marks submitted to the university will be 100 marks for theory and 100 marks for Practicals.

Scheme for calculation of final internal assessment marks:

Theory	Marks	Practicals	Marks
		Practical (OSPE)	60
Theory written paper (Including LEQ, SEQ & SAQ)	60	Viva	10
Formative Assessment (Quiz, PAT, PCT)	20	Logbook +record	20
MCQ	10	Professionalism	05
Seminar	10	AETCOM	05
Total	100		100

Average of the three internal assessment marks is taken into consideration for calculating the final marks for theory written paper and reduced to 60 while calculating final internal assessment marks to be sent to University. Likewise average of marks obtained in MCQs during the 3 internal assessments is reduced to 10. Similarly Average of Marks obtained by continuous Assessment tests like Quiz, PAT, PCT will be reduced to 20 and marks obtained for seminars is reduced to 10 which adds up to 100 marks will be sent as final theory internal assessment marks to University.

Practicals: 100 Marks

Three practical assessments in the form of OSPE, Qualitative and Quantitative for 80 marks will be conducted along with viva for 20 marks. Average of best of three OSPE, Qualitative and Quantitative marks will be taken and reduced to 60 for calculation of final assessment marks to be sent to University. Similarly average of viva marks is reduced to 10. Record maintenance & logbook will be assessed for 20 marks, Professionalism for 5 marks and AETCOM separately for 5 marks which adds up to 100 marks will be sent as final practical internal assessment marks to the University.

Certifiable skills: will be evaluated as per checklist & certificate of accomplishment is awarded which is mandatory to take-up university exam. This will be assessed in log book.

University examination

Theory : 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper. will be of 3 hours. The pattern of questions would be of three types.

Note:

Type of Questions	Number of questions	Marks for each question	Total
MCQ's	20	01	20
Long Essay	02	10	20
Short Essay	06	05	30
Short Answer	10	03	30
Total marks			100

- ◆ Distribution of chapters and suggested marks in parenthesis for Paper I and Paper II in Biochemistry for University examination are as follows.
- ◆ Case based questions will be included in the university examination both in theory and MCQ's.

Distribution of topics for Paper 1 and Paper 2 for University examination Topic wise weightage*

Paper 1 Topics	Weightage
Cell and its subcellular components, Transport mechanism across the cell.	5
Enzyme	13
Vitamins	13
Chemistry of Carbohydrates	6
Metabolism of Carbohydrates	13
Chemistry of Proteins	6
Metabolism of Proteins	13
Nutrition	10
Extracellular Matrix	3
Immunology	6
Intermediary Metabolism and Metabolism in starvation & well fed state	6
Free radicals, Oxidative stress & antioxidants	3
Detoxification	3
Paper II Topics	Weightage
Biological oxidation	6
Chemistry of Lipids	5
Metabolism of Lipids	10
Nucleic Acid chemistry	5
Nucleotide Metabolism	8
Chemistry & metabolism of heme	10
Minerals	10
Acid base balance & disorders	10
Organ function tests	10
Molecular biology	13
Water and electrolyte balance	5
Biochemistry of Cancer	5
Clinical Chemistry	3

*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

B. PRACTICAL-80 marks

Exercise 1: OSPE - 80 Marks

No. of stations- 16

Marks for Each Station: 5

Time for each station: Max 5 min

Skills tested	Number of Stations
Performance	6
Communication Skills	2
Knowledge	4
Clinical/ Laboratory interpretation	4

Viva-Voce Examination: 20 Marks

The viva-voce examination shall carry 20 marks and all examiners will conduct the examination.

Portions of Paper I	10 Marks
Portions of Paper II	10 Marks

SCHEME OF MARKS DISTRIBUTION

University Examination:	
Theory	
Paper – I	100
Paper – II	100
University Examination :	
Practical	80
Viva voce	20
Internal Assessment	
Theory	100
Practical/viva	100

Criteria for passing university examination

- ♦ The student must **secure at least 40% marks in each of the two theory papers** with **minimum 50% of marks in aggregate** (both papers together) to pass.
- ♦ The marks obtained in the viva examination will be added to the practical marks.
- ♦ The student **must secure a minimum of 50% of marks in aggregate in the viva and practical examination** (both combined) to pass.
- ♦ Student must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a Biochemistry in order to be eligible for appearing at the final University examination.

Internal assessment marks will reflect as a separate head of passing at the summative examination and will not be added to the university marks.

- ♦ A **maximum number of four permissible attempts** would be available to clear the first Professional University examination, whereby the **first Professional course** will have to be **cleared** within **4 years of admission** to the said course. Partial attendance at any University examination shall be counted as an availed attempt.
- ♦ There shall be **one main examination** in an academic year and **a supplementary** to be held **not later than 90 days** after the declaration of the results of the main examination.

RECOMMENDED TEXT BOOKS AND REFERENCE BOOKS

Recommended Books

Title	Author	Publisher
Text book of Biochemistry	Vasudevan.D.M	Jaypee
Biochemistry	Sreekumari.S. Sathyanaranana.U Chakrapani.U	Elsevier
Principles and applications of biochemistry in medicine	Rafi	Path Finder Medical Publishers
Text Book of Biochemistry		
Pankaj naik Practical manual	In-house	Department of Biochemistry, Sri Devaraj Urs Medical College Arya
Practical Manual	SK Gupta	

Reference Books

Title	Author	Publisher
Harper's Biochemistry	Murray.R.K. Granner.D.K Mayes.P.A. Rodwell.V.W	Mc Graw-Hill
Illustrated Biochemistry	Champe.P.C Harvey.R.A	J.B.Lippincott Company
Principles of Biochemistry	Lehninger	LBS Publishers
Biochemistry: A case oriented approach	Montgomery	Mosby
Biochemistry with Clinical Correlations	Thomas Devlin	Willy Liss N Y
Clinical Chemistry	Bishop.M.L Duben-Engelkirk Fody.E.P	Lippincott Williams and Wilkins



Competency Number & Certifications	Topic
BI11.4	Perform urine analysis to estimate and determine normal Constituents.
BI11.4	Perform urine analysis to estimate and determine abnormal Constituents.
BI11.20	Identify abnormal constituents in urine, interpret the findings and correlate these with pathological states.
BI11.21	Demonstrate estimation of glucose
BI11.21	Demonstrate estimation of urea
BI11.7/ BI11.21	Demonstrate estimation of serum creatinine and creatinine clearance
BI11.8/BI11.21	Demonstrate estimation of serum total proteins, albumin & A:G ratio

COMMUNITY MEDICINE

Total teaching hours for MBBS First Professional year

Subject	Lecture and SDL	Practicals/SGT/ Tutorials	Total
Community Medicine	20+5	27	52

Community Medicine topics for MBBS First Professional year

SL. NO.	TOPIC
1.	Concept of health and disease
2.	Relationship of social and behavioral to health and Disease
3.	Environmental health problems
4.	Basic statistics and its applications

No	COMPETENCY The student should be able to	Domain K/S/A/ C	Level K/ KH/ SH/P	Core Y/N	Suggested Teaching Learning Method	Suggest- ed As- sessment Method	Vertical Integra- tion	Horizontal Integra- tion	No Hours Teaching
CM 1.1	Define and describe the concept of Public Health	K	KH	Y	Lecture, Small group	Written / Viva voce			1
CM 1.2	Define health; describe the concept of holistic health including concept of spir- itual health and the relativeness & determinants of Health	K	KH	Y	Lecture, Small group	Written / Viva voce			1
CM 1.3	Describe the characteristics of agent, host and environmental factors in health and disease and the multi Factorial etiologic of Dis- ease	K	KH	Y	Lecture, Small group	Written / Viva voce			1
CM 1.4	Describe and discuss the nat- ural history of disease	K	KH	Y	Lecture, Small group	Written / Viva voce			1
CM 1.5	Describe the application of interventions at various levels of Prevention	K	KH	Y	Lecture, Small group	Written / Viva voce			

1CM 1.6	Describe and discuss the concepts, the principles of Health promotion and Education, IEC and Behavioral change communication (BCC)	K	KH	Y	Lecture, Small group	Written / Viva voce		1
CM 1.7	Enumerate and describe health indicator	K	KH	Y	Lecture, Small group	Written / Viva voce		1
CM 1.8	Describe the Demographic profile of India and discuss its impact on Health	K	KH	Y	Lecture, Small group	Written / Viva voce		1
CM 1.9	Demonstrate the role of effective Communication skills in health in a simulated environment	S	SH	Y	DOAP sessions	Skill Assessment	AETCOM	
CM 1.10	Demonstrate the important aspects of the doctor patient relationship in a simulated environment	S	SH	Y	DOAP sessions	Skill Assessment	AETCOM	
CM 2.1	Describe the steps and perform clinico socio-cultural and demographic assessment of the individual, family and community	S	SH	Y	Lecture, Small group	Written / Viva voce		1

CM 2.2	Describe and demonstrate in a simulated environment the assessment of barriers to good health and health seeking behaviour	S	SH	Y	Lecture, Small group	Written / Viva voce			1
CM 2.3	Describe and demonstrate in a simulated environment the assessment of barriers to good health and health seeking behaviour	S	SH	Y	Lecture, Small group	Written / Viva voce			1
CM 2.4	Describe social psychology, community behaviour and community relationship and their impact on health and disease	S	SH	Y	Lecture, Small group	Written / Viva voce			1
CM 2.5	Describe poverty and social security measures and its relationship to health and disease	S	SH	Y	Lecture, Small group	Written / Viva voce			1
CM 3.1	Describe the health hazards of air, water, noise, radiation and pollution	K	KH	Y	Lecture, Small group	Written / Viva voce	General Medicine, ENT	K	1
CM 3.2	Describe concepts of safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting	K	KH	Y	Lecture, Small group	Written / Viva voce			1
CM 3.3	Describe the aetiology and basis of water borne diseases/ jaundice/hepatitis/ diarrheal diseases	K	KH	Y	Lecture, Small group	Written / Viva voce	Microbiology, General Medicine, paediatrics		1

CM 3.4	Describe the concept of solid waste, human excreta and sewage Disposal	K	KH	Y	Lecture, Small group	Written / Viva voce		
CM 3.5	Describe the standards of housing and the effect of housing on Health	K	KH	Y	Lecture, Small group	Written / Viva voce		1
CM 3.6	Describe the role of vectors in the causation of diseases. Also discuss National Vector Borne disease Control Program	K	KH	Y	Lecture, Small group	Written / Viva voce	Microbiology	1
CM 3.7	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	Written / Viva voce	Microbiology	1
CM 3.8	Describe the mode of action, application cycle of commonly used insecticides and rodenticides	K	KH	Y	Lecture, Small group	Written / Viva voce	Pharmacology	1
CM 6.1	Formulate a research question for a study	K	KH	Y	Lecture, Small group	Written / Viva voce	General Medicine, Paediatrics	1
CM 6.2	Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data	S	SH	Y	Lecture, Small group	Written / Viva voce	General Medicine, Paediatrics	1

COMMUNITY MEDICINE: 1 MBBS Practical

No	COMPETENCY The student should be able to	Do-main K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning Method	Suggested Assessment Method	Vertical Integration	Horizontal Integration	No Hours Teaching
CM3.2	Describe concepts of safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting	K	KH	Y	Lecture, Small group/DOAP discussion	Written / Viva voce			5
CM3.4	Describe the concept of solid waste, human excreta and sewage Disposal	K	KH	Y	Lecture, Small group	Written/ viva voce			7
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		7

CM3.8	Describe the mode of action, application cycle of commonly used insecticides and rodenticides	K	KH	Y	Lecture, Small group	Written / Viva voce	Pharmacology	2
CM6.2	Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data	S	SH	Y	Small group, Lecture, DOAP sessions	Written / Viva voce/ Skill assessment	General Medicine, Pediatrics	6

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment:

Community Medicine (Phase I)

1. Theory -100
2. Practicals-100

Theory: 100 marks

Total five internals will be conducted (one during phase I, Two during Phase II and Two during Phase III Part I) Average marks of all five notified theory internal assessment examinations (IAE) is taken into consideration for calculating the final internal assessment marks. Marks obtained by Periodic Assessment tests like Quiz, PCT, MCQs, will be added to theory internal marks.

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	1	20
Long Essay Questions	2	10	20
Short Essay Questions	6	5	30
Reasoning Questions / Short Answer Questions	10	3	30
Total marks			100

Note:

- Case Based Questions: 20% of total marks.
- Two questions based on integration (AITo) in Internal Assessment Examination and one question from AETCOM.
- A student who has not taken minimum required number of tests for Internal Assessment, each in theory and practical will not be eligible for University examinations.
- The results of Internal Assessment should be displayed on notice board within 2 weeks of the test and an opportunity to be provided to the students to discuss the results and get feedback on making their performance better.
- Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Practical/Clinical and Viva: 100 Marks

Five practical assessments will be conducted along with the Theory Internal Assessments. Average marks of the five practical IAE will be taken. The marks obtained for Logbook, Record Book and Professionalism will be added to practical IAE marks. Objective Structured Practical Examination will be a method of assessment in Internal Assessment and Summative examination.

ENVIRONMENTAL STUDIES

(Incorporated in to syllabus as per UGC direction under Honorable supreme court mandate No. DO.No.F.13-1/2000(EA/Env/COS-I, dated 7th August 2014)

SYLLABUS (50 hours) / 4 credits

Unit1: Multidisciplinary nature of environmental studies

Definition, scope and importance (2lectures)
Need for public awareness.

Unit 2 : Natural Resources :

Renewable and non-renewable resources:

Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts overwater, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. Land resources :Land as a resource, land degradation, man induced land slides, soil erosion and desertification.

Role of an individual in conservation of natural resources.

- Equitable use of resources for sustainable lifestyles. (8lectures)

Unit 3 : Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
 - a. Forest ecosystem
 - b. Grass land ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit4:Biodiversity and its conservation

(6lectures)

- Introduction–Definition: genetic, species and eco- system diversity.
- Bio-geographical classification of India
- Value of biodiversity :consumptive use, productive use, social, ethical, aesthetic and option values
- Bio diversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-sports of bio-diversity.
- Threats to bio-diversity: habit at loss, poaching of wildlife, man-wild life conflicts.
- Endangered and endemic species of India
- Conservation of bio-diversity: In-situ and Ex-situ conservation of bio-diversity.

Unit5:Environmental Pollution

(8lectures)

Definition

- Cause, effects and control measures of:-
 - a. Air pollution
 - b. Water pollution
 - c. Soil pollution
 - d. Marine pollution
 - e. Noise pollution
 - f. Thermal pollution
 - g. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management:floods,earthquake,cyclone and landslides. (8lectures)

Unit6:Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, water shed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.

Unit7:Human Population and the Environment

- Population growth, variation among nations.
 - Population explosion–Family Welfare Programme.
 - Environment and human health.
 - Human Rights.
-

-
- Value Education.
 - Women and Child Welfare.
 - Role of Information Technology in Environment and human health.
 - Case Studies.

Unit8: Field work

- Visit to a local area to document environmental assets- river/forest/grassland/hill/mountain
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours)

Waste land reclamation.

- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution)Act.
- Water (Prevention and control of Pollution)Act
- Wild life Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation

Note: Semester System: The Environment course of 50 lectures will be conducted in the second semester and the examination shall be conducted at the end of the second semester

Credit System : The course will be awarded 4credits.

Exam Pattern: In case of awarding the marks, the question paper should carry 100 marks.

The structure of the question paper being:

- Part-A, Short answer pattern - 25marks
- Part-B, Essay type with inbuilt choice - 50marks
- Part-C, Field Work - 25marks

Recommended Books.

1.Text Book of Environmental Studies for under graduate courses By Erach Bharucha
Reprinted in 2006, Orient Longman Private Limited /Universities Press India Pvt. Ltd.

KANNADA

I. GOAL:

The students should gain knowledge of the local language (Kannada) so as to communicate and reciprocate with local people in general and patients in particular to impart proper patient care during the course of their study and future.

II. OBJECTIVES:

A) KNOWLEDGE :

At the end of the Phase -1 MBBS course the student is expected to know :

1. The basic of Kannada Language.
2. Communicate and interact in Kannada Language with patients and colleagues.

B) SKILLS :

At the end of the Phase -1 MBBS course the student is expected to :

1. Identify and write small words and sentences.
2. Acquire communicative skills.
3. To be compassionate towards patient in treatment delivery.

COURSE CONTENTS

Theory	20 Hours
1 Interaction (small words & sentences)	02 Hours
2 Introducing each other	01 Hour
3 Enquiring about the College	01 Hour
4 Enquiring about Room	01 Hour
5 Vegetable Market	02 Hours
6 About Medical College	01 Hour
7 Planned for a picnic	01 Hour
8 Enquiring about one's family	02 Hours
9 Conversation between Doctor and Patient.	02 Hours
10 Enquiring about friend's family	01 Hour
11 Conversation between friends	02 Hours
12 Routine activities of students	02 Hour
13 About children's education	01 Hour
14 Discussion about examination and future plan	01 Hour

Scheme of Examination

Institutional Theory Examination at the end of the Phase -1MBBS Course: **50 Marks**

Reference Books:

Sl. No.	Title	Author	Yr.of Publ.	Publisher
1.	Kannada Kali	Lingadevaru Halemane	2002	Kannada University,



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

**Declared under Section 3 of UGC Act, 1956,
MHRD GOI No.F.9-36/2006-U.3(A) Dt.25th May 2007
POST BOX NO.62, TAMAHA, KOLAR—563103, KARNATAKA, INDIA
Ph:08152-210604, 210605, 243003, 243009, Fax: 08152-243008 Website : www.sduu.ac.in**



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

(A Deemed to be University Declared under Section 3 of UGC Act, 1956)

Comprising Sri DevarajUrs Medical College

[Constituent Unit of Sri DevarajUrs Educational Trust for Backward Classes (Regd.)]

TAMAKA, KOLAR-563103, KARNATAKA, INDIA

Ph: 08152-243009, +91 9448395232 Fax: +918152 - 243008 E-mail: registrar@sduu.ac.in/office@sduu.ac.in. Website: www.sduu.ac.in

(With effect from 2019-2020 batches)

Competency Based Medical Education (CBME)

Curriculum for MBBS

Phase-II


Dean Faculty Of Medicine
Sri Devaraj Urs Academy of Higher
Education & Research, Tamaka, Kolar.

Approved as per BOM-56-2019, (Resolution No-LVI.06) Dated-20/12/2019

REGULATIONS GOVERNING

M.B.B.S. Degree Program (Phase-II Courses)

**Competency Based Medical Education (CBME)
Curriculum**

2019-20



**SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND
RESEARCH**

**COMPRISING SRI DEVARAJ URS MEDICAL COLLEGE
DEEMED TO BE UNIVERSITY**

Declared under Section 3 of UGC Act, 1956,

MHRD GOI No.F.9-36/2006-U.3 (A) Dt.25th May 2007

POST BOX NO.62, TAMAKA, KOLAR-563103, KARNATAKA, INDIA

REGULATIONS GOVERNING M.B.B.S Degree Program (Phase-II Courses)

Competency Based Medical Education (CBME) Curriculum

2019-2020



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

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Ph: 08152-243003, 210604, 210605, Fax: 08152-243008,

web : www.sduu.ac.in

VISION:

“UNIVERSITY OF EXCELLENCE - KNOWLEDGE FOR POSTERITY”

MISSION:

- * To be a global center of excellence for Teaching, Training and Research in the field of Higher education.
- * To inculcate scientific temper, research attitude and social accountability amongst faculty and students.
- * To promote with value based education for the overall personality development and leadership qualities to serve the humanity.

OBJECTIVES:

- * To provide need based infrastructure and facilities to students to become responsible professionals with social commitment and accountability.
- * To implement effectively innovative programs in teaching learning and evaluation.
- * To impart scientific and socio cultural temperament among students to forge national identity and needs.
- * To provide instruction and training in Basic and advanced branches of learning.
- * To provide facilities for research for the advancement and dissemination of knowledge.
- * To undertake extra mural studies, consultancy, extension programmes and field outreach services for the development of society.
- * To collaborate with other Universities, Institutions of excellence and research organizations within the country and outside for the purpose of teaching, training and research.
- * To undertake need based activities for the betterment of socially and educationally backward society.



At a glance this logo is abstract, yet it contains the vital ingredients for an institution like Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.

The institution's medical background, Humanitarian values, Compassion, Approachability, Social Commitment and the subsequent research towards the most precious thing, the human life, is the core theme.

The graphic form of a person in the centre of a bud represents the humanity. It denotes the growing process of life and its existence. And the two hands safeguarding them show the care and a sense of security. It is also capable of holding something within the vast expanse of knowledge by the University for the People's benefit. Hence, the motto "Knowledge for Posterity" is very appropriate and gives a punch in Red. The four light blue half circles (smaller to bigger) depict the unending quest for knowledge and imparting it to a wider horizon, growing higher and higher.

COLORS USED:

Deep Blue: Credible, Confident and Dependable. Represents Peace, Tranquility, Stability, Harmony, Trust, Security, Cleanliness and Loyalty

Light Blue: For Sky and Water (color scheme for 4 half circles)

Red: A dominant color for strengths.

Green: For Nature, Health and Generosity. It's cool quality soothes and has great Healing Powers. As Approved by the Board of Management of The Academy



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No. SDUAHER/KLR/ADMN/1324 /2020-21

Date: 13th Oct. 2020

NOTIFICATION

**Sub: Implementation of revised MBBS curriculum for Phase-II
MBBS subjects - Reg.**

- Ref: 1) M.C.I. Regulations on Graduate Medical Education, 2019.
2) Notification No.MCI-Academics/2019/128072 dt. 06.07.2019.
3) Amendment Notification No.MCI-34(41)/2019-Med./161726
dated 4th Nov. 2019.
4) Proceedings of the 36th Meeting of the Academic Council
held on 30th Sept. 2020.
5) Proceedings of the 59th Meeting of the Board of Management
held on 9th Oct. 2020.

The MCI has released the amended notification on Graduate Medical Education cited at above Reference. The Academy has prepared revised MBBS curriculum aligning with the MCI curriculum. In accordance with the decision taken in the meetings of the Academic Council and the Board of Management of The Academy cited under above reference, The Academy has decided to implement revised MBBS curriculum for Phase-II MBBS subjects from the academic year 2020-21.

Accordingly, The Academy hereby notified the implementation of revised MBBS Curriculum for Phase-II MBBS subjects from the academic year 2020-21 onwards.


Registrar
13/10/2020
Sri Devaraj Urs Academy of Higher
Education and Research
Tamaka, Kolar - 563 103.

Sl. No.	Topics	Page No.
1	CHAPTER I General Considerations And Teaching Approach	7
2	CHAPTER II Regulations governing MBBS degree program Phase wise training and time distribution for professional development	15
3	CHAPTER III Subjects in Second Professional Year	
3.1	PATHOLOGY	34
3.2	PHARMACOLOGY	50
3.3	MICROBIOLOGY	88
3.4	Competencies for Second Professional year (Phase-II)	
	Forensic Medicine	100
	Community Medicine	230
	Otorhinolaryngology	240
	Ophthalmology	247
	General Medicine	255
	General Surgery	271
	Obstetrics & Gynecology	277
	Pediatrics	284
	Orthopedics	289
	Respiratory Medicine	293
	Psychiatry	299
	Radio diagnosis & Radio Therapy	302
	Dermatology	307

Chapter I

General Considerations and teaching approach

Introduction

The Board of Governors in Super-session of Medical Council of India designed the new Competency Based Medical Education curriculum for MBBS Program starting from the academic year 2019-2020 onwards. Sri Devaraj Urs Academy of Higher Education and Research implemented the new regulations for the batch of students admitted to the M.B.B.S. Program from the academic year 2019-2020 onwards. Accordingly in this edition the amendments made by The Board of Governors in Super-session of Medical Council of India as per Amendment Notification Graduate Medical Education Regulation dated 04-11-2019 have been incorporated.

Objectives of the Indian Medical Graduate Training Programme

The undergraduate medical education programme 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 programme are hereby prescribed:-

2.1 NATIONAL GOALS:

At the end of undergraduate programme, 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 to fulfill his/her social obligations towards realization of this goal.
- (b) Learn every aspect of National policies on health and devote her/him 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 professional obligations, so as to respond to national aspirations.

2.2 INSTITUTIONAL GOALS

- (1) 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, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
 - (c) Appreciate rationale for different therapeutic modalities; be familiar with the administration of “essential medicines” and their common adverse 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 Programmes 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 levels of service delivery
 - (vii) Bio-medical waste disposal
 - (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, hospital management, 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 such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.
- (2) All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate.

2.3 Goals and Roles for the Learner

In order to fulfil the goal of the IMG training programme, the 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, behavioural 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 frame works.

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:

- * Disease prevention,
- * Health promotion and cure,
- * Pain and distress alleviation, and
- * Rehabilitation.

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) cancers, in collaboration with other members of the health care team.

3.3. Communicator with patients, families, colleagues and community

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.

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

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

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

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

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

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

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

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

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

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

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

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

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

4. Broad Outline on training format

4.1. In order to ensure that training is in alignment with the goals and competencies listed in sub-clause 2 and 3 above:

4.1.1 There shall be a "Foundation Course" to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

4.1.2 The curricular contents shall be vertically and horizontally aligned and integrated to the maximum extent possible in order to enhance learner's interest and eliminate redundancy and overlap.

4.1.3. Teaching-learning methods shall be learner centric and shall predominantly include small group learning, interactive teaching methods and case based learning.

4.1.4. Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care-based learning experiences and emergencies.

4.1.5. Training shall primarily focus on preventive and community based approaches to health and disease, with specific emphasis on national health priorities such as family welfare, communicable and non- communicable diseases including cancer, epidemics and disaster management.

4.1.6. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.

4.1.7. The development of ethical values and overall professional growth as integral part of curriculum shall be emphasized through a structured longitudinal and dedicated programme on professional development including attitude, ethics and communication.

4.1.8. Progress of the medical learner shall be documented through structured periodic assessment that includes formative and summative assessments. Logs of skill-based training shall be also maintained.

Pandemic Management Module for Under Graduate August 2020 (Module 7)
Longitudinal Module on Management of Pandemics for MBBS course

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Foundation Course	F.1	History of Outbreaks, Epidemics & Pandemics	2	Pre-Clinical
Phase I	1.1	Infection Control: Part - I Infection Control Practices – Hand washing, Decontamination Use of PPEs	4	Microbiology
Phase II	2.1	Infection Control: Part II Air borne precautions, Contact Precautions, Infection Control Committee	4	Microbiology
	2.2	Emerging and Re-emerging infections, early identification and control of new infections	6	Community Medicine
	2.3	Sample Collection, Microbial diagnosis, Serologic tests and their performance parameters	6	Microbiology
	2.4	Vaccination strategies including vaccine development & Implementation	6	Community Medicine Biochemistry
	2.5	Therapeutic strategies including new drug development	6	Pharmacology, General Medicine
Phase III Part 1	3.1	Outbreak Management including Quarantine, Isolation, Contact Tracing	5	Community Medicine
	3.2	Interdisciplinary Collaboration, Principles of Public Health Administration, Health Economics, International Health	5	
	3.3	Operational Research, Field work, Surveillance	8	
Electives		Epidemiology and research Components		Community Medicine
Phase III Part 2	4.1	Care of patients during Pandemics	6	Clinical departments (General Medicine, Pulmonary Medicine, Anaesthesiology as Integrated sessions)
	4.2	Emergency Procedures	8	
	4.3	Death related management	2	
	4.4	Communications and media management	4	
	4.5	Intensive Care Management during Pandemics	4	
	4.6	Palliative Care during Pandemics	4	
Total			80 hours	

Skills suggested

1. Infection Control related

- a. Hand washing
- b. PPE Donning & Doffing
- c. Disinfection

2. Diagnostic

- a. Sample collection
- b. Sample transportation & storage
- c. Choose the appropriate test based on performance parameters

3. Disease Management

- a. Pharmaco-vigilance measures
- b. Protocol based Management
- c. Therapeutic decision making
- d. Terminal care including CPR, ALS, PALS

4. Epidemic Management

- a. Outbreak investigation
- b. Contact tracing, Quarantine and Isolation
- c. Surveillance
- d. Documentation

5. Research

- a. Operational research
- b. Clinical trial protocol preparation including Vaccine trials
- c. Ethical considerations

6. Communication

- a. To the media
- b. Use of Telemedicine
- c. Patient & stakeholder communication

7. Intensive Care

8. Palliative care during pandemics

Chapter II

REGULATIONS GOVERNING M.B.B.S. DEGREE PROGRAM

PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

Provided that in respect of batches admitted prior to the academic year 2019-20, the governing provisions shall remain as contained in the Part I of these Regulations.

7. Training period and time distribution:

7.1. Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into nine semesters from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.

7.2. Each academic year will have at least 240 teaching days with a minimum of eight hours of working on each day including one hour as lunch break.

7.3. Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include problem oriented learning, case studies, community oriented learning, self- directed and experiential learning.

7.4. The period of 4 ½ years is divided as follows:

7.4.1 Pre-Clinical Phase [(Phase I) - First Professional phase of 13 months preceded by Foundation Course of one month]: will consist of preclinical subjects – Human Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module and early clinical exposure, ensuring both horizontal and vertical integration.

7.4.2 Para-clinical phase [(Phase II) - Second Professional (12 months)]: will consist of Para-clinical subjects namely Pathology, Pharmacology, Microbiology, Community Medicine, Forensic Medicine and Toxicology, Professional development including Attitude, Ethics & Communication (AETCOM) module and introduction to clinical subjects ensuring both horizontal and vertical integration

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the primary level of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- (a) Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- (b) Involvement in patient care as a team member,
- (c) Involvement in patient management and performance of basic procedures.

7.5 Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem oriented approach, case studies and community health care activities.

The admission shall be made strictly in accordance with the statutory notified time schedule towards the same.

7.6

(ii) A learner shall not be entitled to graduate later than ten (10) years of her/his joining the first MBBS course.

7.8 A learner, who fails in the second Professional examination, shall not be allowed to appear in third Professional Part I examination unless she/he passes all subjects of second Professional examination.

7.10 During para-clinical and clinical phases, including prescribed 2 months of electives, clinical postings of three hours duration daily as specified in Tables 3 and 4 would apply for various departments.

8. Phase distribution and timing of examination

8.1 Time distribution of the MBBS programme is given in Table 1.

Table 1: Time distribution of MBBS Programme & Examination Schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I									Exam III MBBS Part I	Electives & Skills	
III MBBS Part II											
Exam III MBBS Part II		Internship									
Internship											

8.2 Distribution of subjects by Professional Phase-wise is given in Table 2.

Table 2: Distribution of subjects by Professional Phase

Phase & year of MBBS training	Subjects & New Teaching Elements	Duration#	University examination
First Professional MBBS	- Foundation Course (1 month) - Human Anatomy, Physiology & Biochemistry, introduction to Community Medicine, Humanities - Early Clinical Exposure	1 + 13 months	I Professional
	Attitude, Ethics, and Communication Module (AETCOM)		
Second Professional MBBS	- Pathology, Microbiology, Pharmacology, Forensic Medicine and Toxicology, - Introduction to clinical subjects including Community Medicine - Clinical postings - Attitude, Ethics & Communication Module (AETCOM)	12 months	II Professional
Third Professional MBBS Part I	- General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Psychiatry, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Respiratory medicine, Radiodiagnosis & Radiotherapy, Anesthesiology - Clinical subjects /postings - Attitude, Ethics & Communication Module (AETCOM)	13 months	III Professional (Part I)
Electives	Electives, Skills and assessment*	2 months	
Third Professional MBBS Part II	- General Medicine, Pediatrics, General Surgery, Orthopedics, Obstetrics and Gynecology including Family welfare and allied specialties - Clinical postings/subjects - Attitude, Ethics & Communication Module (AETCOM)	13 months	III Professional (Part II)

8.3 Minimum teaching hours prescribed in various disciplines are as under Tables 3.

Table 3: Second Professional teaching hours

Subjects	Lectures (hours)	Small group learning (Tutorials / Seminars) /Integrated learning (hours)	Clinical Postings (hours) *	Self - Directed Learning (hours)	Total (hours)
Pathology	80	138	-	12	230
Pharmacology	80	138	-	12	230
Microbiology	70	110	-	10	190
Community Medicine	20	30	-	10	60
Forensic Medicine and Toxicology	15	30	-	5	50
Clinical Subjects	75**	-	540***		615
Attitude, Ethics & Communication Module (AETCOM)		29	-	8	37
Sports and extracurricular activities	-	-	-	28	28
Total	-	-	-	-	1440

*At least 3 hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories. Hours may be distributed weekly or as a block in each posting based on institutional logistics.

** 25 hours each for Medicine, Surgery and Gynecology & Obstetrics.

***The clinical postings in the second professional shall be 15 hours per week (3 hrs per day from Monday to Friday).

8.4 Distribution of clinical postings is given in Table 4.

Table 4: Clinical postings

Subjects	Period of training in weeks			Total weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	-	-	8* (4 regular clinical posting)	4
General Medicine ¹	4	4	8+4	20
General Surgery	4	4	8+4	20
Obstetrics & Gynaecology ²	4	4	8+4	20
Pediatrics	2	4	4	10
Community Medicine	4	6	-	10
Orthopedics - including Trauma ³	2	4	2	8
Otorhinolaryngology	4	4	-	8
Ophthalmology	4	4	-	8
Respiratory Medicine	2	-	-	2
Psychiatry	2	2	-	4
Radiodiagnosis ⁴	2	-	-	2
Dermatology, Venereology & Leprosy	2	2	2	6
Dentistry & Anesthesia	-	2	-	2
Casualty	-	2	-	2
	36	42	48	126

* In four of the eight weeks of electives, regular clinical postings shall be accommodated. Clinical postings may be adjusted within the time framework.

¹This posting includes Laboratory Medicine(Para-clinical) & Infectious Diseases(Phase III Part I).

² This includes maternity training and family welfare (including Family Planning).

³This posting includes Physical Medicine and Rehabilitation.

⁴ This posting includes Radiotherapy, wherever available.

8.5 Duration of clinical postings will be:

8.5.1 Second Professional: 36 weeks of clinical posting (Three hours per day - five days per week: Total 540 hours)

8.6 Time allotted excludes time reserved for internal / University examinations, and vacation.

8.7 Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University. Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.

9.4. Professional Development including Attitude, Ethics and Communication Module (AETCOM)

9.4.1 Objectives of the programme: At the end of the programme, the learner must demonstrate ability to:

- a. Understand and apply principles of bioethics and law as they apply to medical practice and research; understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- b. Understand and apply the principles of system based care as they relate to the care of the patient,
- c. Understand and apply empathy and other human values to the care of the patient,
- d. Communicate effectively with patients, families, colleagues and other health care professionals,
- e. Understand the strengths and limitations of alternative systems of medicine,
- f. Respond to events and issues in a professional, considerate and humane fashion,
- g. Translate learning from the humanities in order to further his / her professional and personal growth.

9.4.2 Learning experiences:

- a. This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,
- b. Learning experiences may include – small group discussions, patient care scenarios, workshop, seminars, role plays, lectures etc.
- c. Attitude, Ethics & Communication Module (AETCOM module) developed by Medical Council of India should be used longitudinally for purposes of instruction.

9.4.3 75% attendance in Professional Development Programme (AETCOM Module) is required for eligibility to appear for final examination in each professional year.

9.4.4 Internal Assessment will include:

- a. Written tests comprising of short notes and creative writing experiences,
- b. OSCE based clinical scenarios / viva voce.

9.4.5 At least one question in each paper of the clinical specialties in the University examination should test knowledge competencies acquired during the professional development programme.

9.4.6 Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.

9.5. Learner-doctor method of clinical training (Clinical Clerkship)

9.5.1 Goal: To provide learners with experience in:

- (a) Longitudinal patient care,
- (b) Being part of the health care team,
- (c) Hands-on care of patients in outpatient and inpatient setting.

9.5.2 Structure:

- (a) The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- (b) The learner-doctor programme will progress as outlined in Table 5.

(c) The learner will function as a part of the health care team with the following responsibilities:

- Be part of the unit's outpatient services on admission days,
- Remain with the admission unit until 6 PM except during designated class hours,
- Be assigned patients admitted during each admission day for whom he/she will undertake responsibility, under the supervision of a senior resident or faculty member,
- Participate in the unit rounds on its admission day and will present the assigned patients to the supervising physician,
- Follow the patient's progress throughout the hospital stay until discharge,
- Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients (according to responsibilities outlined in table 5),
- Participate in unit rounds on at least one other day of the week excluding the admission day,
- Discuss ethical and other humanitarian issues during unit rounds,
- Attend all scheduled classes and educational activities,
- Document his/her observations in a prescribed log book / case record.

(d) No learner will be given independent charge of the patient

(e) The supervising physician will be responsible for all patient care decisions

9.5.3 Assessment:

(a) A designated faculty member in each unit will coordinate and facilitate the activities of the learner, monitor progress, provide feedback and review the log book/ case record.

(b) The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.

(c) The log book should also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

Table 5: Learner - Doctor Programme (Clinical Clerkship)

Year of Curriculum	Focus of Learner - Doctor programme
Year 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness
Year 2	History taking, physical examination, assessment of change in clinical status, communication and patient education
Year 3	All of the above and choice of investigations, basic procedures and continuity of care
Year 4	All of the above and decision making, management and outcomes

COMPETENCY BASED CURRICULUM OF THE INDIAN MEDICAL GRADUATE PROGRAMME

10. Specific Competencies

10.1. Preamble:

The salient feature of the revision of the medical curriculum in 2019 is the emphasis on learning which is competency-based, integrated and learner-centered acquisition of skills and ethical & humanistic values.

Each of the competencies described below must be read in conjunction with the goals of the medical education as listed in items 2 to 3.5.5. It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline. Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self-directed learning. Learners must be encouraged to take active part in and shared responsibility for their learning.

The global competencies to be achieved by the learner are outlined above in Chapter 1- section 3. Since the MBBS programme assessment will continue to be subject based, subject specific competencies have been outlined. These have to be acquired by the learner in the corresponding professional year. These competencies must be interpreted in the larger context outlined in section 3 and may be considered as “sub competencies” of the global competencies.

10.2. **Integration** must be horizontal (i.e. across disciplines in a given phase of the course) and vertical (across different phases of the course). As far as possible, it is desirable that teaching/learning occurs in each phase through study of organ systems or disease blocks in order to align the learning process. Clinical cases must be used to integrate and link learning across disciplines.

ASSESSMENT

11.1. Eligibility to appear for Professional examinations

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

(a) Attendance

1. Attendance requirements are 75% in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject. In subjects that are taught in more than one phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject.
2. If an examination comprises more than one subject (for e.g., General Surgery and allied branches), the candidate must have 75% attendance in each subject and 80% attendance in each clinical posting.
3. Learners who do not have at least 75% attendance in the electives will not be eligible for the Third Professional - Part II examination.

(b) Internal Assessment: Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test etc.

1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each Preclinical / Para-clinical subject and no less than two examinations in each clinical subject in a professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.
2. When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
3. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
4. The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
5. Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.

6. The results of internal assessment should be displayed on the notice board within a 1-2 weeks of the test. Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.
7. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.
8. **Internal assessment marks will not be added to University Examination marks and will reflect as a separate head of passing at the summative examination**
Internal Assessment examination: 200 (Theory 100 and Practical 100) Marks
 - a. Criteria for calculating Internal Assessment eligibility marks for appearing MBBS Phase-II examinations for the students admitted from the academic year 2019-20 onwards are as shown in table 6

Table 6 Internal assessment marks for Second Professional Year

Theory		Practical	
	Marks		Marks
Internal Assessment Examination	80	Internal Practical Examination	50
Periodic Assessments Tests	20	Viva -Voce	20
		Logbook and Record Book	10+10
		Professionalism	05
		AETCOM	05
Total Marks	100		100

- b. Average marks of all three notified theory internal assessment examinations (IAE) will be reduced to 80. Average marks obtained from Periodic Assessment Tests (Marks 20) will be added to IAE. The sum of IAE and PAT for 100 marks will be sent to the University. Average marks of the three practical IAE including viva-voce shall be calculated for 70. The marks obtained for Logbook (10marks), Record Book (10marks), Professionalism (05marks) and AETCOM (05marks) will be added to practical IAE marks and the marks obtained for 100 will be sent to University.

Theory: 100 marks

Minimum of three internal assessments (IA) will be conducted at the end of each module for 100 marks. The pattern of question paper is represented in table 7. Average marks of all three notified theory internal assessment examinations (IAE) is taken into consideration for calculating the final internal assessment marks. Marks obtained by Periodic Assessment tests like Quiz, PCT, MCQs, will be added to theory internal marks.

Table 7 Pattern of question paper for internal assessment examination

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	1	20
Long Essay Questions	2	10	20
Short Essay Questions	6	5	30
Reasoning Questions / Short Answer Questions	10	3	30
Total marks			100

Note:

- Case Based Questions: 20% of total marks.
- Two questions based on integration (AITo) in Internal Assessment Examination and one question from AETCOM.
- A student who has not taken minimum required number of tests for Internal Assessment, each in theory and practical will not be eligible for University examinations.
- The results of Internal Assessment should be displayed on notice board within 2 weeks of the test and an opportunity to be provided to the students to discuss the results and get feedback on making their performance better.
- The third internal examination in Paraclinical subjects should be prelim or pre-university examination.
- Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Practical and Viva- voce : 100 Marks

Three practical assessments and viva-voce will be conducted along with the Theory Internal Assessments. Average marks of the three practical IAE and viva-voce will be taken. The marks obtained for Logbook, Record Book, Professionalism and AETCOM will be added to practical IAE marks. Objective Structured Practical Examination will be a method of assessment in Internal Assessment and Summative examination.

University Examinations

11.2.1 University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.

11.2.2 Nature of questions will include different types such as structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure at least

40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass.

11.2.3 Practical/clinical examinations will be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

11.2.4 Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

11.2.5 There shall be one main examination in an academic year and a supplementary to be held not later than 90 days after the declaration of the results of the main examination.

11.2.6 A learner shall not be entitled to graduate after 10 years of his/her joining of the first part of the MBBS course.

11.2.7 University Examinations shall be held as under:

(a)First Professional

1. The first Professional examination shall be held at the end of first Professional training (1+12 months), in the subjects of Human Anatomy, Physiology and Biochemistry.

2. A maximum number of four permissible attempts would be available to clear the first Professional University examination, whereby the first Professional course will have to be cleared within 4 years of admission to the said course. Partial attendance at any University examination shall be counted as an availed attempt.

(b)Second Professional

1. The second Professional examination shall be held at the end of second professional training (11 months), in the subjects of Pathology, Microbiology, and Pharmacology.

(c)Third Professional

1. Third Professional Part I shall be held at end of third Professional part 1 of training (12 months) in the subjects of Ophthalmology, Otorhinolaryngology, Community Medicine and Forensic Medicine and Toxicology

2. Third Professional Part II - (Final Professional) examination shall be at the end of training (14 months including 2 months of electives) in the subjects of General Medicine, General Surgery, Obstetrics & Gynecology and Pediatrics. The discipline of Orthopedics, Anesthesiology, Dentistry and Radiodiagnosis will constitute 25% of the total theory marks incorporated as a separate section in paper II of General Surgery.

3.The discipline of Psychiatry and Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis will constitute 25% of the total theory marks in General Medicine incorporated as a separate section in paper II of General Medicine.

(d) Examination schedule is in Table 1.

(e) Marks distribution is in Table 8.

Table 8 : Marks distribution for various subjects

Phase of Course	Written-Theory – Total	Practicals/Orals/ Clinicals	Pass Criteria
First Professional			<u>Internal Assessment:</u> 50% combined in theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations
Human Anatomy - 2 papers	200	100	
Physiology - 2 papers	200	100	
Biochemistry - 2 papers	200	100	
Second Professional			
Pharmacology - 2 Papers	200	100	
Pathology - 2 papers	200	100	
Microbiology - 2 papers	200	100	<u>University Examination</u> Mandatory 50% marks separately in theory and practical (practical = practical/ clinical + viva)
Third Professional Part – I			
Forensic Medicine & Toxicology - 1 paper	100	100	
Ophthalmology – 1 paper	100	100	
Otorhinolaryngology – 1 paper	100	100	
Community Medicine - 2 papers	200	100	
Third Professional Part – II			
General Medicine - 2 papers	200	200	
General Surgery - 2 papers	200	200	
Pediatrics – 1 paper	100	100	
Obstetrics & Gynaecology - 2 papers	200	200	

Note: At least one question in each paper of the clinical specialties should test knowledge - competencies acquired during the professional development programme (AETCOM module); Skills competencies acquired during the Professional Development programme (AETCOM module) must be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

11.2.8 Criteria for passing in a subject: A candidate shall obtain 50% marks in University conducted examination separately in Theory and Practical (practical includes: practical/clinical and viva voce) in order to be declared as passed in that subject.

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be as represented in table 9.

Table 9 Pattern of question paper for University examination

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	01	20
Long Essay Questions	02	10	20
Short Essay Questions	06	05	30
Short Answer Questions	10	03	30
Total marks			100

- Case Based Questions: 20% of total marks.
- Two questions based on integration (AITo) and one question from AETCOM.

6. SUBMISSION OF LABORATORY RECORD NOTE BOOK:

At the time of Practical/Clinical Examination each candidate shall submit to the Examiners his/her laboratory notebook duly certified by the Head of the Department as a bonafide record of the work done by the candidate.

7. DECLARATION OF CLASS:

- A candidate having appeared in all the subjects in the same examination and passes that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed in the examination with distinction.
- A candidate having appeared in all the subjects in the same examination and passes that examination in the first attempt and secures 65% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed examination in First class.
- A candidate having appeared in all the subjects in the same examination and passes that examination in the first attempt and secures 50% of marks or more but less than 65% of grand total marks prescribed will be declared to have passed the examination in Second class.
- A candidate passing the university examination in more than one attempt shall be placed in **pass class** irrespective of the percentage of marks secured by him / her in the examination.
[Please note fraction of marks should not be rounded off for clauses (a), (b) and (c)]

Excerpts from Medical Council of India Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019

Scheduling of IA

A proposed schedule of tests for IA is given below. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year. Prior to university examinations, departments can conduct additional tests as and when required with the purpose of providing formative feedback to the students. In subjects that are taught at more than one phase, proportionate weightage must be given for internal assessment for each Phase. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently. A student who has not taken minimum required number of tests for IA each in theory and practical will not be eligible for University examinations. Proper records of the work should be maintained which will form the basis for the students' internal assessment and should be available to the assessors at the time of inspection of the college by the Medical Council of India.

Components of IA

- i. Theory IA can include: theory tests, send ups, seminars, quizzes, interest in subject, scientific attitude etc. Written tests should have short notes and creative writing experiences.
- ii. Practical/Clinical IA can include: practical/clinical tests, Objective Structured Clinical Examination (OSCE)/Objective Structured Practical Examination (OSPE), Directly Observed Procedural Skills (DOPS), Mini Clinical Evaluation Exercise (mini-CEX), records maintenance and attitudinal assessment.

The IA of broader specialties should also include marks from all the allied specialties e.g. General Medicine should include marks of Psychiatry, Dermatology, Venereology & Leprosy and Respiratory Medicine including tuberculosis etc. while General Surgery should include Orthopaedics, Dentistry, Anaesthesiology and Radio-diagnosis etc. so that students do not ignore these postings. The proportion of the marks for each allied specialty shall be proportionate to the time of instruction allotted to each. It may be noted that although very small contribution is being made by allied subjects, yet it serves as motivator to the students to not miss these postings. When subjects are taught in more than one phase - the assessment must be done in each phase and must contribute proportionally to final internal assessment. Example of theory paper and some examples of questions are given below.

Suggested phase wise scheduling of tests for internal assessment for Colleges (This is only a suggested sample plan. Local changes can be made if they conform to proposed GMER 2019)

Phase	Minimum Number of tests during the year	Remarks
1 st	Human Anatomy 3, Physiology 3, Biochemistry 3, Community Medicine 1	•ECE assessment should be included subject-wise •There should be at least one short question from AETCOM in each subject •One of the 3 tests in preclinical subjects should be prelim or pre-university examination
2 nd	Pathology 3, Pharmacology 3, Microbiology 3, Two tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Dentistry, Anaesthesiology and Radiodiagnosis), Obstetrics & Gynaecology, Forensic Medicine & Toxicology and Community Medicine End of posting (EOP) examination at each clinical posting including those of allied subjects	•Clinical subjects should also be assessed at end of each posting (EOP) – Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the 3 tests in Para- clinical subjects should be prelim or pre-university examination
3 rd	Forensic Medicine & Toxicology 2, Community Medicine 2 Ophthalmology 2, Otorhinolaryngology 2, Two tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Anaesthesiology and Radiodiagnosis), Pediatrics, Obstetrics & Gynaecology EOP examination at each clinical posting including allied subjects	•Clinical subjects should also be tested at end of each posting (EOP)-Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the tests in Ophthalmology, Otorhinolaryngology /Forensic Medicine & Toxicology/ Community Medicine should be prelim or pre-university examination

4 th	Two Tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Anaesthesiology and Radiodiagnosis), Pediatrics, Obstetrics & Gynaecology EOP examination at each clinical posting including that in allied subjects	•Clinical subjects should also be tested at end of each posting (EOP) -Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the tests in Medicine, Surgery, Pediatrics and Obstetrics & Gynaecology should be prelim or pre- university examination •Assessment of electives to be included in IA
	AETCOM: Attitude, Ethics and Communication	

The internal Assessment marks for each subject will be out of 100 for Theory and out of 100 for Practical/ Clinical (Except in General Medicine, General Surgery and Obstetrics and Gynecology, in which Theory and clinical will be of 200 marks each).

Internal assessment marks will reflect as a separate head of passing at the summative examination and will not be added to the University marks.

Twenty five percent of weightage in theory tests in Medicine and Surgery should be given to allied subjects and there should be at least one question from each allied subject.

Examples of theory questions

Sl. No.	Type	Explanation	Examples
1	Long essay question	The question should pose a clinical/practical problem to the students and require them to apply knowledge and integrate it with disciplines. Avoid giving one liners as questions. The question stem should be structured and marking distribution should be provided. Use action verbs from higher domains as given in this document. Please avoid simple recall based questions. What is asked in the examination generally sets the agenda of what and how the students learn.	- A 6 days old term neonate has presented with jaundice noted at 3 days of age. He is born out of normal delivery at home. On examination, he looks pale, has a liver of 5 cms and spleen of 2 cms. Other systemic examination is normal. - What is your provisional diagnosis? - Which other conditions need to be considered? - Enumerate the lab tests that you will order and their likely reports in each of the diagnosis that you considered. - Explain the physical findings in the light of underlying derangements. - Describe the clinical features, complications and management of type 2 diabetes mellitus. (3+3+4=10)
2	Short notes	These provide opportunity to sample a wider content, albeit in a short time. The questions should be task oriented rather than 'Write a short note on xxx'. (Two questions based on ECE in Phase 1 in internal assessment) (Two questions based on integration in Phase 2 & 3 in internal assessment)	- What are the various ways in which acute glomerulonephritis can present during childhood? - What is the role of antibiotics in childhood diarrhoeas? - What is the utility of routine vitamin K administration during new born period? - Compare and contrast the use of ramipril and amlodipine in treatment of hypertension.
3	Reasoning Questions	These provide excellent opportunities for testing integration, clinical reasoning and analytic ability of the student.	Which components of breast milk help in prevention of neonatal infections? How do they help in prevention of infection? Plan immunization for a 2 years old totally un-immunized child.

			What is the physiological basis of origin of respiratory sounds? How can they help us in making a diagnosis? Explain why adrenaline is the preferred medication in anaphylactic shock.
4	Short notes Applied aspects	(Pre & Para-Clinical subjects: questions on applied aspect) (Clinical subjects: questions on preclinical basis)	<u>Pre & Para-Clinical subjects:</u> Describe clinical significance of half-life of drugs. <u>Clinical subjects:</u> Explain patho-physiological basis of clinical features of heart failure
5	Short notes AETCOM	(one question on AETCOM in all subjects in all phases)	Pharmacovigilance program of India AETCOM: What are the rights of a patient in a hospital setting
6	MCQs	MCQs should be scenario based, single response with 4 options in answers. Avoid one liner and negative terms in stem of question. Avoid 'all of above' and 'none of above' in options.	1. A 25 year old lady was using oral contraceptives successfully for last two years. She got tuberculosis and was prescribed Rifampicin. She became pregnant after 2 months of starting Rifampicin despite continuing the oral contraceptives. Which of the following effects of Rifampicin can be the reason for this? - Induction of oral contraceptive metabolism - Stimulation of ovulation - Interruption of entero-hepatic circulation - Increased excretion of oral contraceptives Key: A 2. A 2 year old child presents with excessive weight gain over last 1 week. He has puffyeyes, pitting edema and normal blood pressure. Urine examination shows no RBCs but massive proteinuria. Which of the following biochemical parameters is likely to be elevated in this child? - Urea - Cholesterol - Creatinine

			d. Uric acid Key: B 3. Which of the following term best describes the decreased effects of beta adrenergic agonists in bronchial asthma after long term use? a. Pharmacokinetic tolerance b. Pharmacodynamic tolerance c. Tachyphylaxis d. Drug dependence Key : B

Note: AETCOM question should be based on competencies (primarily knowledge based) acquired during teaching of the AETCOM module. At least one question in each paper of the clinical specialties should test knowledge - competencies acquired during the professional development programme (AETCOM module); Skills competencies acquired during the Professional Development programme (AETCOM module) must be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure atleast 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

Subjects in Second Professional Year

PATHOLOGY

GOAL:

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

OUTCOMES:

Competencies: The undergraduate must demonstrate:

1. Comprehension of the causes, evolution and mechanisms of diseases,
2. Knowledge of alterations in gross and cellular morphology of organs in disease states,
3. Ability to correlate the natural history, structural and functional changes with the clinical manifestations of diseases, their diagnosis and therapy,

Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing deviations from normal structure and function and clinically correlated so as to provide an overall understanding of the etiology, mechanisms, laboratory diagnosis, and management of diseases”

“At the end of I MBBS Phase II, a medical student, in Pathology should be able to:

- Describe common hematological disorders and the investigations necessary to diagnose them
- Describe the pathological basis of cell injury in different tissues and organs
- Describe the normal hemostatic mechanism and the derangement of these mechanisms
- Describe the etiopathogenesis, the pathological effect and the clinic pathological correlations of common infectious and noninfectious diseases
- Describe the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body
- Correlate normal and altered morphology of different organ systems in different diseases to the extent needed for understanding of the disease processes and their clinical significance
- Describe the etiopathogenesis of common immunological disorders
- Describe the principles of collection, handling, storage and dispatch of clinical samples
- Describe different types of Bio-medical waste, their potential risks and their management
- Describe the organization and functioning of the laboratory and be aware of the safety precautions to be taken in the laboratories.
- Describe the common methods of collection of samples for hematological and biochemical investigations and anticoagulants to be used.

- Describe the methods of collection of body fluids and for cytological examinations and the preservatives to be used.
- Perform and interpret physical and chemical examinations of urine including the microscopy and the application of the tests in diagnosis of diseases.
- Perform haematology exercises including Hemoglobin estimation, E.S.R. peripheral smears study, P.C.V. and cell counts (R.B.C., W.B.C., Absolute Eosinophil count), and hematological indices, total and differential count, reticulocyte count, blood grouping, techniques and interpretation of bone marrow preparations to be demonstrated.
- Describe the methods of collection and transportation of biopsy specimens to the laboratory, method of processing of samples and common histological techniques including H & E stain and a few special stains like PAS, Perl's Prussian stain and Papanicolaou etc.
- Identify as the common histopathological, hematological and cytological slides and specimens and interpret the laboratory investigations.
- Correlate the history and identify the common histopathological and hematological slides and specimens.
- Describe the use of rapid diagnostic methods and principle and use of Auto Analyzers.

COURSE CONTENTS:

***PA 1.1- number of the competency as represented in the MCI curriculum booklet ** where first two alphabets PA represents subject Pathology and number following alphabet reflects topic number.**

SL. NO.	COMPETENCIES	CORE	NON CORE	HOURS
1	Introduction to Pathology (PA 1.1 – 1.3)	√		2
2	Cell injury and Adaptation (PA2.1 – 2.8)	√		11.5
3	Amyloidosis (PA3.1 – 3.2)	√		3
4	Inflammation (PA4.1 – 4.4)	√		10
5	Healing and Repair (PA5.1)	√		2
6	Hemodynamic disorders (PA6.1 - 6.7)	√		11
7	Neoplastic disorders (PA 7.1 – 7.5)	√		12
8	Basic diagnostic cytology (PA8.1 – 8.3)	√		2
9	Immunopathology and AIDS (PA9.1 -9.7)	√		7
10	Infections and Infestations(PA10.1 – 10.4)	√		3
11	Genetic and Pediatric diseases (PA11.1 – 11.3)		√	6
12	Environment and Nutritional Disorders (PA12.1 – 12.3)	√		5

13	Introduction to Hematology (PA 13.1 – 13.5)	√		6.5
14	Microcytic Anemia (PA14.1 -14.3)	√		4
15	Macrocytic anemia (15.1 – 15.4)	√		4
16	Hemolytic Anemia (PA16.1 – 16.7)	√		8
17	Aplastic Anemia (PA17.1 – 17.2)		√	2
18	Leucocyte Disorders (PA18.1 – 18.2)	√		6
19	Lymph Node and Spleen (PA19.1 – 19.7)	√		4.5
20	Plasma Cell Disorders (PA20.1)	√		2
21	Hemorrhagic Disorders (PA21.1 – 21.5)	√		8
22	Blood Banking and Transfusion (PA22.1-22.7)	√		5
23	Clinical pathology (PA23.1 – 23.3)	√		6
24	Gastrointestinal Tract (PA24.1 – 24.7)	√		11
25	Hepatobiliary System (PA35.1 – 25.6)	√		7
26	Respiratory System (PA26.1 – 26.7)	√		15
27	Cardiovascular System (PA 27.1 – 27.10)	√		9.5
28	Urinary Tract (PA28.1 – 28.16)	√		10.5
29	Male Genital Tract(PA29.1- 29.5)	√		7
30	Female Genital Tract (PA 30.1 – 30.9)	√		9.5
31	Breast (PA31.1 – 31.4)	√		4
32	Endocrine System (PA32.1 – 32.9)	√		8.5
33	Bone and Soft Tissue (PA33.1 – 33.5)	√		7
34	Skin (PA 34.1 – 34.4)	√		2.5
35	Central Nervous System (PA 35.1 – 35.3)	√		5
36	Eye (PA 36.1)		√	3
	Total			230

PRACTICAL:

The entire practical have been categorized as ‘Procedures’ and ‘Demonstrations’. The procedures are to be performed by the students during practical classes to acquire skills. Some of these would be included in the practical during University examination. Those categorized as “Demonstrations” are to be shown to students during practical classes. However, these Demonstrations would not be included in the university examinations, but questions based on these would be given in the form of data, charts, problems and case – histories, for interpretation by students.

Sl No.	PA Code	List of Competency with DOAP	OSPE Stations
1	PA2.8	Identify and describe various forms of cell injuries, their manifestations and consequences in gross and microscopic specimens	Gross and Microscopy of Ischemia Specimens of Intestine, Heart, Kidney etc
2	PA3.2	Identify and describe amyloidosis in a pathology specimen	Gross and Microscopy of Amyloidosis
3	PA4.4	Identify and describe acute and chronic inflammation in gross and microscopic specimens	Gross and Microscopy of Acute appendicitis, lobar pneumonia, tuberculosis lung and chronic osteomyelitis
4	PA6.7	Identify and describe the gross and microscopic features of infarction in a pathologic specimen	Gross and microscopy of Myocardial Infarction
5	PA8.3	Observe a diagnostic cytology and its staining and interpret the specimen	Cytology of Pap smear inflammatory and malignant Cytology of Fluid positive for malignancy
6	PA13.5	Perform, Identify and describe the peripheral blood picture in anemia	Peripheral Smear Preparation and Examination and Investigation chart of Anemia
7	PA14.3	Identify and describe the peripheral smear in microcytic anemia	Peripheral Smear of microcytic hypochromic anemia
8	PA15.3	Identify and describe the peripheral blood picture of macrocytic anemia	Peripheral Smear of macrocytic anemia
9	PA16.6	Prepare a peripheral blood smear and identify hemolytic anaemia from it	Peripheral Smear of hemolytic anemia

10	PA19.3	Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	Gross and microscopy tuberculosis Lymph node of
11	PA19.5	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	Gross and microscopy of Hodgkin's Lymphoma
12	PA19.7	Identify and describe the gross specimen of an enlarged spleen	Gross and microscopy of Splenomegaly
13	PA20.1	Describe the features of plasma cell myeloma	Microscopy and Investigations Chart of Multiple Myeloma
14	PA23.1	Describe abnormal urinary findings in disease states and identify and describe common urinary abnormalities in a clinical specimen	Investigation Chart for Urine Analysis Microscopy for casts / crystals / UTI Perform Urine examination and interpret the findings
15	PA23.3	Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests	Investigations Chart of Semen Analysis, Thyroid Function test, Renal Function test and Liver Function Test
16	PA25.6	Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	Investigation Chart for Liver function test for hepatitis / obstructive jaundice
17	PA27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	Investigation Chart for Biochemical findings in acute coronary syndromes
18	PA31.3	Describe and identify the morphologic and microscopic features of carcinoma of the breast	Gross, Microscopy and Cytology of malignant breast disease
19	PA34.4	Identify, distinguish and describe common tumors of the skin	Gross and microscopy of SCC, BCC and melanoma
20	PA35.3	Identify the etiology of meningitis based on given CSF parameters	Investigation Chart of meningitis

Certifiable Skills

List of Certificate Skills	Number of times for certification
Prepare a peripheral blood smear and identify hemolytic anaemia from it	1
Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	1
Identify the etiology of meningitis based on given CSF parameters	1

***Learners must have completed the required certifiable competencies for that phase of training to be eligible for appearing at the final university examination of that subject.**

LOG BOOK:

Logbook helps the student in maintaining a record of:

- Periodic assessment tests
- Certifiable skills
- Self-directed learning,
- Reflections of AETCOM module
- Feedback.

***Learners must update the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.**

Aligned and Integrated topics (AITO)

Medical Council of India. Alignment and Integration Module for Undergraduate M

Medical Education Program, 2019: pp 1- 34

- Anemia
- Jaundice
- Diabetes
- Thyroid Diseases
- Nutrition
- Febrile Illness
- Tuberculosis
- Malaria
- Diarrhoea
- Ischemic Heart Diseases
- Polycystic Ovarian Syndrome

***Assessment for AITo will be subject based.**

AETCOM:

“Medical Council of India, Attitude, Ethics and Communication (AETCOM) Competencies” for the Indian Medical Graduate 2018

First two modules of the AETCOM as prescribed in the MCI AETCOM booklet will be conducted as given below:

Module 2.2: The foundations of bioethics

Competencies addressed:

The student should be able to:	Level
1. Describe and discuss the role of non-maleficence as a guiding principle in patient care	KH
2. Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care	KH
3. Describe and discuss the role of beneficence of a guiding principle in patient care	KH
4. Describe and discuss the role of a physician in health care system	KH
5. Describe and discuss the role of justice as a guiding principle in patient care	KH

Module 2.5: What does it mean to be a patient?

Competencies addressed:

The student should be able to:	Level
Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care	KH

***There should be at least one short question from AETCOM in each subject**

T EACHING HOURS AND METHODS:

Total Number of Hrs: 230

Theory Didactic Lectures	80 Hrs.
SGT/practicals/tutorials/integrated learning	138 Hrs
SDL	12 Hrs.
Total	230 Hrs

System wise distribution of Teaching Hours:

Sl. No.	System	No.of Hrs.
1	Introduction to Pathology (PA 1.1 – 1.3)	2
2	Cell injury and Adaptation (PA2.1 – 2.8)	11.5
3	Amyloidosis (PA3.1 – 3.2)	3
4	Inflammation (PA4.1 – 4.4)	10
5	Healing and Repair (PA5.1)	2
6	Hemodynamic disorders (PA6.1 - 6.7)	11
7	Neoplastic disorders (PA 7.1 – 7.5)	12
8	Basic diagnostic cytology (PA8.1 – 8.3)	2
9	Immunopathology and AIDS (PA9.1 -9.7)	7
10	Infections and Infestations(PA10.1 – 10.4)	3
11	Genetic and Pediatric diseases (PA11.1 – 11.3)	6
12	Environment and Nutritional Disorders (PA12.1 – 12.3)	5
13	Introduction to Hematology (PA 13.1 – 13.5)	6.5
14	Microcytic Anemia (PA14.1 -14.3)	4
15	Macrocytic anemia (15.1 – 15.4)	4
16	Hemolytic Anemia (PA16.1 – 16.7)	8
17	Aplastic Anemia (PA17.1 – 17.2)	2
18	Leucocyte Disorders (PA18.1 – 18.2)	6
19	Lymph Node and Spleen (PA19.1 – 19.7)	4.5
20	Plasma Cell Disorders (PA20.1)	2
21	Hemorrhagic Disorders (PA21.1 – 21.5)	8
22	Blood Banking and Transfusion (PA22.1 – 22.7)	5
23	Clinical pathology (PA23.1 – 23.3)	6
24	Gastrointestinal Tract (PA24.1 – 24.7)	11
25	Hepatobiliary System (PA35.1 – 25.6)	7
26	Respiratory System (PA26.1 – 26.7)	15
27	Cardiovascular System (PA 27.1 – 27.10)	9.5
28	Urinary Tract (PA28.1 – 28.16)	10.5
29	Male Genital Tract(PA29.1- 29.5)	7
30	Female Genital Tract (PA 30.1 – 30.9)	9.5
31	Breast (PA31.1 – 31.4)	4
32	Endocrine System (PA32.1 – 32.9)	8.5
33	Bone and Soft Tissue (PA33.1 – 33.5)	7
34	Skin (PA 34.1 – 34.4)	2.5
35	Central Nervous System (PA 35.1 – 35.3)	5
36	Eye (PA 36.1)	3

Classes may be coordinated and integrated with relevant departments on various topics as scheduled below.

TEACHING LEARNING METHODS:

- Didactic lectures
- Structured interactive sessions
- Small group discussion
- Problem based learning
- Practical including demonstrations
- Computer assisted learning
- Self-directed learning
- Integrated teaching at horizontal & vertical levels
- E-modules

METHODS OF ASSESSMENT:

- Long and Short essay question
- Short notes questions.
- MCQs
- Case Based Questions
- OSPE
- Open Book tests
- Periodic Assessment test
- Records Review
- Microscopic examination
- Quiz
- Assignment
- Oral Viva Voce

LEARNING RESOURCE MATERIALS:

- Text books
- Reference books
- Practical note books
- Internet resources
- Video films etc.

SCHEME OF EXAMINATION

Medical Council of India. Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019: pp 1-29.

Students must secure at least 50% marks of the total marks (combined in theory & practical) assigned for Internal assessment to be declared successful at the final university examination of that subject.

Scheme for calculation of internal assessment: Total marks-200

Theory (maximum marks)	Marks	Practical's	Marks
Theory written paper	80	Practical	50
		Viva-Voce	20
		Logbook + record	10+10
Formative Assessment (Quiz, PAT, PCT, seminar, foundation course)	20	Professionalism	05
		AETCOM	05
Total	100		100

Theory: 100 Marks

Minimum of three internal assessments (IA) will be conducted at the end of each Block with other departments for 100 marks. Average of the Three IA marks is taken into consideration for calculating the final internal assessment marks.

Marks obtained by continuous Assessment tests like Quiz, PAT, PCT, seminar will be considered for theory internal marks

Average marks of all three notified theory internal assessment examinations (IAE) will be reduced to 80. Average marks obtained from Periodic Assessment Tests (Marks 20) will be added to IAE. The sum of IAE and formative assessment for 100 marks will be sent to the University. Average marks of the three practical IAE including viva-voce will be calculated for 70. The marks obtained for Logbook (10 marks), Record Book (10 marks), Professionalism (05 marks) and AETCOM (05 marks) will be added to practical IAE marks and the marks obtained for 100 will be sent to University.

Type of Questions	Number of questions	Marks for each question	Total
MCQ's*	20	1	20
Long Essay**	Case based-1 Normal-1	10	20
Short Essay	6	5	30
Short Answer***	10	3	30
Total marks			100

*MCQ to be case scenario based

** One question to be case based

***Two questions based on integration (? AITo) in Internal Assessment Examination and one question from AETCOM

Note:

- A student who has not taken minimum required number of tests for IA each in theory and practical will not be eligible for University examinations.

- The results of IA should be displayed on notice board within 2 weeks of the test and an opportunity to be provided to the students to discuss the results and get feedback on making their performance better.
- The third internal examination in Paraclinical subjects should be prelim or pre- university examination.
- 20% of the Internal assessment will be by MCQ
- Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Practical and Viva: 100 Marks

Three practical assessments in the form of OSPE and OSCE will be conducted along with the Theory Internal Assessments. Average of best of three will be taken. Record maintenance & logbook assessed will be added to practicals. Professionalism will be a separate assessment & marks is considered for practicals.

Certifiable skills: will be evaluated as per checklist & certificate of accomplishment is awarded which is mandatory to take-up university exam.

University examination

Theory: 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be of three types.

Note:

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	01	20
Long Essay Questions	02	10	20
Short Essay Questions	06	05	30
Short Answer Questions	10	03	30
Total marks			100

Distribution of chapters and suggested marks in parenthesis for Paper I and Paper II in Pathology for University examination are as follows*:

***Paper-1**

General Pathology including Clinical Pathology and Hematology Max: 100 marks

System	Marks
General Pathology	50
Clinical Pathology	15
Hematology	20
Clinical Hematology	15
Total	100

Paper-II Systemic Pathology**Max: Marks: 100**

System	Marks
Cardiovascular System	20
Respiratory System	
Alimentary System including diseases of liver, Gall bladder & Exocrine Pancreas.	20
Endocrine system - Disease of Thyroid, Adrenals, Parathyroid, Pituitary and Endocrine pancreas.	20
Lymphoreticular system	
Urinary System	20
Male Genital system	
Female Genital system	
Breast	20
Musculoskeletal system	
Nervous system	
Skin	
Total	100

*Note: The distribution of topics and marks are suggestive. Some overlapping is inevitable. The students are expected to study and answer overlapping topics.

B: PRACTICAL EXAMINATION:**Maximum Marks: 80**

Practical I:OSPE	40 marks
Clinical Pathology	10 marks
Hb estimation/Blood grouping	10 marks
Urine examination	10 marks
Urine interpretation	10 marks
Practical II:(OSPE)	40 marks
Histopathology Specimen Histopathology	10 marks
Slide	10marks
Peripheral Smear Examination	10 marks
Hematology tests Interpretation	10marks

C. VIVA - VOCE EXAMINATION:**Maximum marks: 20**

The oral examination shall carry 40 marks and all the examiners will conduct the oral examination.

Topics	Marks
General Pathology	05
Clinical Pathology	05
Systemic Pathology-I (C.V.S., R.S., G.I.T.)	05
Systemic pathology-II (Renal system, Bones, Joints, Male & Female reproductive system, Endocrinology, Skin, CNS, Lymphnode and Spleen)	05

Examination components and distribution of marks

A.	University Theory Examination	Marks
1.	Paper I	100
	Paper II	100
	Total	200
	Theory	
B.	University Practical Examination	
1.	Practical	80
2.	Viva – voce	20
	Total Practical	100
C.	Internal Assessment Examination (IAE)	
1.	Internal assessment (Theory)	100
2.	Internal assessment (Practical)	100
	Total IAE	200
	Grand total	500

Criteria for passing university examination

- The student must secure at least 40% marks in each of the two theory papers with minimum 50% of marks in aggregate (both papers together) to pass.
- The marks obtained in the viva examination will be added to the practical marks.
- The student must secure a minimum of 50% of marks in aggregate in the viva and practical examination (both combined) to pass.
- Students must secure at least 50% marks of the total marks (combined in theory & practical) assigned for Internal assessment to be declared successful at the final university examination of that subject.
- Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.

LIST OF HAEMATOLOGY SLIDES AND INSTRUMENTS RECOMMENDED

a. HAEMATOLOGY SLIDES (Minimum of 10 slides)

- Microcytic Hypochromic anemia
- Macrocytic anemia
- Dimorphic anemia.
- Haemolytic anaemia.
- Normocytic Hypochromic Anemia
- Eosinophilia
- Reticulocytes
- Acute myeloblastic leukemia
- Chronic myeloid leukemia

- Acute lymphoblastic leukemia
- Chronic lymphatic leukemia
- Multiple myeloma- Bone marrow
- Microfilaria
- Malaria parasite

b. INSTRUMENTS (Minimum ten)

- Lumbar puncture needle
- Liver biopsy needle
- Bone marrow aspiration needle
- Wintrobe's Tube with stand
- Westergren's E.S.R. Tube and Stand
- Urinometer
- R.B.C. Pipette
- W.B.C. Pipette
- Sahli's Haemoglobinometer
- Sahli's Haemoglobinometer -Diluting tube.
- Sahli's Haemoglobinometer- Pipette.
- Albuminometer
- Neubauer's Counting Chamber

A. List Of Histopathology Slides And Specimen

- Acute Appendicitis
- Lobar Pneumonia
- T.B. Lung
- T.B. Lymphnode
- Sequestrum
- Fatty Liver
- C.V.C. Liver
- Lipoma
- Squamous cell carcinoma Foot
- Malignant Melanoma
- Cavernous Haemangioma Liver
- Chondroma
- Madura Mycosis
- Gastric Ulcer
- Adenocarcinoma Colon
- T.B. Intestine

- Polyp-Intestine
- Typhoid Ulcer - Intestine
- Intussusception
- Amoebic Ulcer-Intestine
- Gall Stones
- Portal Cirrhosis
- Bronchiectasis
- Emphysema
- Secondaries in Lung
- Bronchogenic Carcinoma
- Rheumatic Endocarditis
- Rheumatic Pericarditis
- Mitral & Aortic Stenosis
- Atheroma Aorta
- Chronic Glomerulonephritis
- Hydronephrosis
- Vesical Calculus
- Wilm's Tumour
- Carcinoma - Kidney
- Carcinoma - Penis
- Seminoma Testis
- Mucinous Cyst adenoma
- Dermoid Cyst - Ovary
- Leiomyoma Uterus
- Hydatidiform Mole
- Osteoclastoma
- Osteosarcoma
- Fibro adenoma - Breast
- Carcinoma - Breast
- Multinodular Goitre
- Micro nodular and macro nodular cirrhosis
- Meningitis
- Amoebic liver abscess
- Gangrene foot/hand
- Infarction – heart
- Infarction-spleen
- Infarction - lung
- Carcinoma of cervix.
- Carcinoma of stomach.
- Chronic pyelonephritis.

B. LIST OF CHARTS FOR DISCUSSION & SPOTTERS

- T.B. Meningitis
- Viral Meningitis
- Pyogenic Meningitis
- Nephrotic Syndrome
- Ac. Lymphoblastic Leukemia
- Ac. Myeloblastic Leukemia
- Chronic Lymphatic Leukemia
- Chronic Myeloid Leukemia
- Microcytic hypochromic anemia
- Multiple Myeloma
- Spherocytic anemia with Hemolytic Jaundice
- Obstructive Jaundice
- Juvenile Diabetic Ketoacidosis
- Vaginal Smear - Carcinoma cervix
- FNAC - Fibroadenoma Breast
- FNAC - Infiltrating Duct Carcinoma Breast

RECOMMENDED BOOKS:

1. Robbins & Cotran. Pathologic Basis of Disease: South Asia Edition, 10Ed by Vinay Kumar, Abul K Abbas and Jon C Aster. Elsevier. 2020.
2. MOHAN (Harsh), Textbook of Pathology, 8Ed, 2019. Jaypee Brothers, New Delhi.
3. SOOD Ramnik Medical Laboratory Technology, Ed. 6, Jaypee Brothers, New Delhi, 2016.

REFERENCE BOOKS

1. DACIE (Sir John) and LEWIS (SM), Practical Haematology, 11Ed, Churchill Livingstone, London 2013.
2. Boyd's Text book of Pathology. 10th Edition. 2013.
3. Anderson's pathology. 10th Ed. Editor: Ivan Damjanov. Elsevier India, 2014.
4. HENRY (John): Clinical Diagnosis and Management by Laboratory Method, Ed-22. WB Saunders's Company, London. A Prism Indian Edition, 2011, (Jaypee).

RECOMMENDATIONS MADE BY THE BOARD OF MEMBERS
DEPARTMENT OF PHARMACOLOGY
(For students admitted in 2019-2020 onwards)

COURSE DESCRIPTION

GOAL

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

COMPETENCIES

The undergraduate must demonstrate

1. Knowledge about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics
2. Ability to select and prescribe medicines based on clinical condition and the pharmacologic properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national importance
3. Knowledge of Pharmacovigilance, essential medicine concept and sources of drug information and industry-doctor relationship
4. Ability to counsel patients regarding appropriate use of prescribed drug and drug delivery systems

Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing the interaction between drug, host and disease in order to provide an overall understanding of the context of therapy.

COURSE OUTCOMES

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

a. Knowledge and Intellectual skills

1. Explain the general principles of drug action, pharmacokinetic parameters and drug interactions in individuals including special situations
2. List routes of drug administration and explain the advantages and disadvantages of each route with examples
3. Explain the clinical relevance of pharmacokinetic principles in different disease conditions
4. Explain the pharmacological basis of therapeutics for common and essential drugs

5. Identify the dosage forms and demonstrate the correct method of calculation of drug dosage in patients including special situations
6. Write a correct prescription in the recommended format for different clinical conditions and critically analyze a given prescription and rewrite the correct one
7. Identify and document the Adverse Drug Reaction in the format provided
8. Explain the principles of Pharmacovigilance, Pharmacoeconomics, essential medicines, p-drug concept and prepare and explain a list of P-drugs for a given case/condition
9. Explain the clinical presentation and treatment of common poisonings including the bites and stings
10. Analyze critically the medications given in case scenarios, in terms of (a) pharmacological action of the ingredients (b) cost (c) rational or irrational nature of fixed dose drug combinations
11. Perform a critical evaluation of the drug promotional literature and interpret the same

b. Psychomotor

1. Demonstrate parenteral administration of drugs in mannequin
2. Prepare the Oral Rehydration Salt Solution and educate the simulated patient about its use

c. Communication/Attitude

1. Motivate simulated patient with chronic disease to adhere to the medication
2. Educate simulated patient regarding the benefits and limitations of over the counter medication (OTC)
3. Demonstrate, instruct and counsel a simulated patient, the use of medication devices
4. Demonstrate how to optimize interaction with pharmaceutical representative to get authentic information on drugs
5. Communicate to the simulated patient with empathy and ethics regarding all aspects of drug use

COURSE CONTENTS:

PH 1.1- Competency as represented in the MCI Competency Based Undergraduate Curriculum for the Indian Medical Graduate Volume –I 2018, where first two alphabets PH represents subject Pharmacology and number following alphabet reflects topic number, following period is a running number.

THEORY

Sl. No.	Competencies	Domain K/S/A/C	Level K/KH/SH/P	Core (Yes/No)	Suggested Teaching Learning method	Suggested Assessment method	Vertical Integration (VI)	Horizontal integration (HI)	*Hours
1	General Pharmacology PH 1.1, 1.2, 1.4, 1.5, 1.7, 1.8, 1.11, 1.56, 1.59, 1.64	K	KH	Yes	Lecture/ Student seminar	Written and Viva Voce	-----	-----	16
2	Autonomic nervous system PH 1.13, 1.14	K	KH	Yes	Lecture	Written and Viva Voce	-----	-----	10
3	Peripheral nervous system PH 1.15, 1.17	K	KH	Yes	VI	Written and Viva Voce	PY, AS	-----	03
4	Autacoids PH 1.16	K	KH	Yes	Lecture/ VI	Written and Viva Voce	IM	-----	07
5	Central nervous system PH 1.18, 1.19, 1.20, 1.21	K	KH	Yes	Lecture/ VI/ Student seminar	Written and Viva Voce	AS, PS PY, IM	-----	16
6	Renal system PH 1.24	K	KH	Yes	Lecture	Written and Viva Voce	-----	-----	02
7	Blood PH 1.25, 1.35	K	KH	Yes	Lecture/ VI/ HI	Written and Viva Voce	PY, IM	PA	07

8	Cardiovascular system PH 1.26, 1.27, 1.28, 1.29, 1.30, 1.31	K	KH	Yes (except 1.30)	Lecture/VI	Written and Viva Voce	PY, IM	-----	12
9	Respiratory system PH 1.32, 1.33	K	KH	Yes	VI	Written and Viva Voce	CT	-----	02
10	Gastrointestinal system PH 1.34	K	KH	Yes	Lecture/VI	Written and Viva Voce	IM	-----	05
11	Endocrine system PH 1.36, 1.37, 1.38, 1.39, 1.40, 1.41	K	KH	Yes	Lecture/VI	Written and Viva Voce	IM, OBG	-----	15
12	Chemotherapy PH 1.42, 1.43, 1.44, 1.45, 1.46, 1.47, 1.48, 1.49	K	KH	Yes	Lecture/VI/ HI	Written and Viva Voce	IM, PE, CT DR	MI	29
13	Immunology PH 1.50, 1.54	K	KH	Yes	Lecture	Written and Viva Voce	-----	-----	02
14	Miscellaneous PH 1.57, 1.58, 1.61	K	KH	Yes	Lecture/VI	Written and Viva Voce	DR, OP	-----	02
15	Toxicology PH 1.51, 1.52, 1.53	K	KH	Yes	Lecture/VI/ Student seminar	Written and Viva Voce	IM	-----	03

* Hours= Lecture, seminar and integrated teaching

Theory: Competencies with Specific Learning Objectives (SLOs) and teaching learning methods (TLM)

Section	Competencies with SLOs At the end of the course, II MBBS student should be able to	Lecture 80	Seminar 05	IT 46	SDL 12
GP	PH 1.1 Define and describe the principles of Pharmacology and Pharmacotherapeutics				
	Define the terminologies with examples: Pharmacology, Drug, Pharmacy, Pharmacognosy, Pharmacokinetics, Pharmacodynamics, Pharmacogenetics, Pharmacovigilance and Pharmacoeconomics, Pharmacopoeia and chemotherapy	√	-----	----	---- -
	Mention the sources of drug with example	√	-----	----	---- -
GP	PH 1.11 Describe various routes of drug administration, eg., oral, SC, IV, IM, SL				
	List routes of drug administration with examples	√	-----	----	---- -
	Explain the advantages and disadvantages of oral, intravenous, intramuscular, subcutaneous route, sublingual, intrathecal, inhalational and rectal route	√	-----	----	---- -
GP	PH 1.4 Describe absorption, distribution, metabolism & excretion of drugs				
	Describe various modes of drug transport across the membrane Explain absorption of drugs administered through various routes	√	-----	----	---- -
	Describe drug distribution in different compartments of the body Explain various barriers for distribution Explain the clinical significance of plasma protein binding Define redistribution and explain clinical significance of redistribution with examples	√	-----	----	---- -
	Define biotransformation and explain its consequences with examples Explain the phases of biotransformation reactions with examples Explain enzyme induction and enzyme inhibition with examples Define first pass metabolism with examples Explain the factors affecting biotransformation reactions	√	√	----	---- -

	Explain various routes of drug excretion with examples (DC – Elimination of drugs)				
	Explain orders of kinetics with examples Define clearance and explain clinical significance of hepatic and renal clearance	√	-----	----	---- -
	Explain how duration of action can be prolonged by altering absorption, distribution, metabolism and excretion of drugs with examples	√	-----	----	---- -
	<u>Clinical Pharmacokinetics</u> Define bioavailability and explain the factors affecting it Calculate bioavailability by plotting the graph and using formula Define bioequivalence Explain the clinical significance of bioavailability Define volume of distribution (V_d) Calculate V_d and plasma $t_{1/2}$ by plotting the graph and using formula Explain the clinical significance of volume of distribution Define plasma $t_{1/2}$ and explain the factors affecting plasma $t_{1/2}$ Explain the clinical significance of plasma $t_{1/2}$	√	-----	----	---- -
GP	PH 1.5 Describe general principles of mechanism of drug action				
	Explain various mechanisms of drug action with examples Explain the following terms with examples: agonist, antagonist, partial agonist and inverse agonist	√	-----	----	---- -
	Explain transducer mechanisms with examples	√	-----	----	---- -
	Explain factors modifying the drug action	-----	√	----	---- -
	Explain types of drug tolerance (DC- Tachyphylaxis)	√	-----	----	---- -
GP	PH 1.8 Identify and describe the management of drug interactions				
	Explain types of drug interaction and their clinical significance	√	-----	----	---- -
GP	PH 1.7 Define, identify and describe the management of adverse drug reactions (ADR)				

	Define adverse drug reaction, adverse drug event, side effect and toxic effect Classify adverse drug effects Explain side effects, secondary effects, toxic effects, intolerance, idiosyncrasy, drug allergy, photosensitivity, drug dependence, drug withdrawal reaction, teratogenicity, mutagenicity and carcinogenicity and drug induced diseases with examples	√	-----	----	----	-
GP	PH 1.56 Describe basic aspects of Geriatric and Pediatric pharmacology					
	Describe the effect of age on absorption, distribution, metabolism and excretion of drugs in children and elderly Explain the pharmacodynamic factors affecting drug action in pediatric and geriatric individuals Explain the disadvantages of polypharmacy in elderly	√	-----	----	----	-
GP	PH 1.60 Describe and discuss Pharmacogenomics					
	Define the terms Pharmacogenetics and Pharmacogenomics and explain with examples	√	-----	----	----	-
GP	PH 1.64 Describe overview of drug development, Phases of clinical trials and Good Clinical Practice					
	Define preclinical studies Explain the terms placebo, informed consent form, ethics committee, blinding, randomization, standard control, standard and cross over studies Define clinical trials and explain the phases (I – IV) of clinical trials	√	-----	----	----	-
GP	PH 1.2 Describe the basis of Evidence based medicine					
	Define evidence based medicine Enumerate and explain the type of studies based on the level of evidence Explain the relevance of evidence based medicine in clinical practice	√	-----	----	----	-
GP	PH 1.59 Describe and discuss the following: Fixed dose combinations, Herbal medicines					
	Define fixed dose combination (FDC) and list advantages and disadvantages of it List the herbal medicines with their uses	√	-----	----	----	-
	Total hours	14	2	0	0	
ANS	PH 1.13 Describe mechanism of action, types, doses, side effects,					

	indications and contraindications of adrenergic and anti-adrenergic drugs				
	Explain the synthesis, storage, release and metabolism of Noradrenaline (NA) at Nor Adrenergic Junction (NAJ) List the drugs interfering with Nor Adrenergic Transmission List the receptors in sympathetic system and explain the mechanism, distribution and actions mediated through these receptors	√	-----	----	---- -
	Explain the mechanism, pharmacological actions, uses with their doses and adverse drug reactions of Adrenaline/ Noradrenaline/ Dopamine/ Isoprenaline List differences between catecholamines and non-catecholamines List sympathomimetics. Explain their mechanism of action, uses, dose and adverse effects	√	-----	----	---- -
	Classify antiadrenergic drugs. Explain their mechanism of action, pharmacological actions, uses with their dose, adverse effects and contraindications	√	-----	----	---- -
ANS	PH 1.14 Describe mechanism of action, types, doses, side effects, indications and contraindications of cholinergic and anticholinergic drugs				
	Explain the synthesis, storage and release and pharmacological actions of Acetylcholine Classify cholinergic receptors and cholinomimetic drugs	√	-----	----	---- -
	Explain the pharmacological actions, uses with their dose and adverse effects of cholinomimetic drugs	√	-----	----	---- -
	Classify cholinesterase inhibitors. Explain the mechanism of action, uses with their dose and adverse effects of cholinesterase inhibitors Explain pharmacological treatment of myasthenia gravis	√	-----	----	---- -
	Classify drugs used in glaucoma. Explain their mechanism of action and adverse effects	√	-----	----	---- -
	Explain the clinical features and management of organophosphorous poisoning	√	-----	----	---- -
	Classify anticholinergic drugs Explain the mechanism of action, pharmacological actions, uses with their dose, adverse effects and contraindications of atropine and its substitutes	√	-----	----	---- -

	Explain the treatment of atropine overdose	√	----	----	----
	Total hours	10	----	----	----
PNS	PH 1.15 Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants				
	Classify skeletal muscle relaxants Explain mechanism of action, pharmacokinetics, uses with their dose, adverse effects, drug interactions and contraindications of peripherally acting skeletal muscle relaxants Enumerate the differences between pancuronium and succinylcholine Explain pharmacological treatment of malignant hyperthermia and succinylcholine apnoea Explain mechanism of action, uses with their dose and adverse effects of centrally acting muscle relaxants	----	----	√ PY AS	---- -
PNS	PH 1.17 Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of local anesthetics				
	Classify local anaesthetics. Explain their mechanism of action, pharmacological actions, pharmacokinetics, uses with dose and adverse effects Explain the different types of local anaesthesia and mention the procedures performed List the complications and contraindications of spinal anaesthesia Explain the composition and uses of eutectic mixture	----	----	√ AS	---- -
	Total hours	----	----	3	---- -
Autacoids	PH 1.16 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				
	List the histamine receptors and mention the pharmacological actions of histamine	√	----	----	---- -

	Classify H ₁ receptor antagonists and explain their pharmacological actions, uses with their dose and adverse effects Explain the advantages of second generation antihistaminics over first generation List the drug with their dose used in treatment of vertigo?				
	Classify 5-HT receptors and mention the pharmacological actions of 5-HT List the 5-HT agonists and antagonists. Mention their uses with dose	√	-----	-----	---- -
	Explain the pharmacological treatment of migraine Explain the mechanism of action, adverse effects and contraindications of ergotamine and sumatriptan	-----	----	-----	√
	Explain the pharmacological actions of PGE ₂ , PGF _{2α} , TXA ₂ , PGI ₂ and leukotrienes List the uses with their dose and adverse effects of prostaglandins and their analogues	√	-----	----	---- -
	Classify Non-Steroidal Anti-inflammatory Drugs (NSAIDs) and explain their mechanism of action, pharmacological actions, pharmacokinetics, uses with their dose, drug interactions and adverse effects Explain mechanism of action, pharmacological actions, uses and adverse effects of paracetamol Explain the pharmacological management of acute salicylate poisoning Explain management of paracetamol overdose Explain mechanism of action, pharmacological actions, uses and adverse effects of selective COX-2 (cyclooxygenase) inhibitors	√	-----	----	---- -
	Classify drugs used in rheumatoid arthritis and explain the mechanism of action and adverse effects of disease modifying anti-rheumatoid drugs (DMARDs)	-----	----	√ IM	---- -
	List drugs used in gout and explain their mechanism of action, uses with dose and adverse effects List drug interactions of probenecid and allopurinol	√	-----	----	---- -
	Total hours	6	-----	1	2
CNS	PH 1.18 Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of general anesthetics, and pre-anesthetic medications				

	List intravenous and inhalational anesthetic agents Explain the pharmacokinetics of inhaled anesthetic agents Explain mechanism of action, uses with dose, adverse effects, advantages and disadvantages of general anaesthetic agents Explain the rationale for using pre anaesthetic medications	----	----	√ AS	---- -
CNS	PH 1.19 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)				
	Classify drugs used in anxiety. Explain their mechanism of action, uses and adverse effects	----	----	----	√
	List sedative and hypnotics. Explain their pharmacokinetics, mechanism of action, pharmacological actions, therapeutic uses with dose, and adverse effects Explain the mechanism of action, uses and adverse effects of flumazenil Explain the pharmacological management of barbiturate poisoning List the differences between benzodiazepines and barbiturates	√	----	----	---- -
	Classify drugs used in schizophrenia. Explain the mechanism of action, uses with their dose and adverse effects of typical and atypical antipsychotic agents Explain the advantages of atypical antipsychotics	----	----	√ PS	---- -
	Classify drugs used in depression. Explain their mechanism of action, pharmacological actions, uses with their dose, adverse effects and drug interactions List the advantages of Selective serotonin reuptake inhibitors (SSRIs) over tricyclic antidepressants (TCAs)	√	----	√ PS	----
	List the drugs used in treatment and prophylaxis of bipolar disorder Explain the mechanism of action and adverse effects of lithium Explain the management of acute lithium toxicity	----	----	√ PS	----
	Classify of opioids. Explain their pharmacological actions, uses with their dose, adverse effects and contraindications	√	----	√ PY	----

	Explain the pharmacological actions, uses with their dose and adverse effects of opioid antagonists				
	Classify drugs used in treatment of parkinsonism. Explain mechanism of action and adverse effects of each group of drugs Explain the rationale for combining levodopa with carbidopa Mention the drugs with their basis used for treatment of drug induced parkinsonism	√	√	----	----
	Classify antiepileptic drugs. Explain their mechanism of action, uses with their dose, adverse effects, drug interactions and teratogenic effects Explain the treatment of status epilepticus	----	----	√ IM	----
CNS	PH 1.20 Describe the effects of acute and chronic ethanol intake				
	Explain the pharmacological actions, uses, adverse effects and drug interactions of ethyl alcohol Explain the management of alcohol de-addiction	----	----	√ PS	√
CNS	PH 1.21 Describe the symptoms and management of methanol and ethanol poisonings				
	Explain the manifestations and management of acute ethyl alcohol intoxication Explain the manifestations and management of methanol intoxication	----	----	√ IM	----
	Total hours	6	1	9	4
Renal system	PH 1.24 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				
	List diuretics. Explain mechanism of action, pharmacological actions, pharmacokinetics, uses and adverse effects of furosemide, thiazides, spironolactone, acetazolamide and mannitol List antidiuretics Explain mechanism of action, pharmacological actions, pharmacokinetics, uses and adverse effects of vasopressin List vasopressin/ADH antagonists and their uses	√	----	----	----
	Total hours	2	----	----	----
Blood	PH 1.25 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				
	Classify anticoagulants Explain mechanism of action, uses, dose and adverse effects of heparin and low molecular weight heparin Explain the mechanism of action, uses, dose, adverse effects and drug interactions of warfarin List the advantages of low molecular weight heparin over heparin Explain the treatment of heparin and warfarin overdose	----	√	√ PY IM	----
	List the antiplatelet agents Explain the mechanism of action, uses, dose and adverse effects of antiplatelet drugs	----	----	√ PY, IM	----
	List fibrinolytics. Explain mechanism of action, uses, dose, adverse effects and contraindications of fibrinolytics Mention advantages and disadvantages of various fibrinolytics Mention antifibrinolytic drugs. Explain their mechanism of action and uses with dose.	----	----	√ PY IM	----
	List plasma expanders. Explain their uses, dose and adverse effects	----	----	√ PY, IM	----
Blood	PH 1.35 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				
	<u>Drugs used in anemias</u> List the oral iron preparations. Mention their uses, dose and adverse effects List the parenteral iron preparations. List the indications with dose for parenteral iron therapy and their adverse effects Explain the manifestations and treatment of acute iron poisoning List the vitamin B12 preparations and their uses List the uses of folic acid and folinic acid List the uses and adverse effects of erythropoietin	√	----	√ PY, IM Including pathology	----

	<u>Colony Stimulating factors</u> List the myeloid and megakaryocyte growth factors. Explain their mechanism of action, therapeutic uses, dose and adverse effects	√	----	----	----
	Total hours	1	1	5	----
CVS	PH 1.26 Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin-angiotensin and aldosterone system				
	List drugs blocking Renin Angiotensin Aldosterone System (RAAS) Explain mechanism of action, pharmacokinetics and clinical uses, dose, adverse effects, contraindications, drug interactions of ACE Inhibitors List Angiotensin Receptor Blockers (ARBs). Explain their mechanism of action, clinical uses, dose, adverse effects, contraindications and drug interactions	----	----	√ PY, IM	----
CVS	PH 1.27 Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock				
	Classify drugs used in hypertension Explain the mechanism of action, uses, dose and adverse effects of drugs used in hypertension List drugs used in hypertensive emergency List drugs used in pregnancy induced hypertension Mention drugs used in hypertension with co-morbid conditions Define shock. Classify types of shock Explain treatment of different types of shock	√	----	√ IM	----
CVS	PH 1.28 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	----	----	----	----
	Classify drugs used in angina pectoris Explain the mechanism of action, uses, dose and adverse effects of nitrates List the drugs used in myocardial infarction and the rationale for their use List the drugs used in peripheral vascular diseases	----	----	√ IM	----

	Explain the mechanism of action, uses, dose and adverse effects of drugs used in treatment of peripheral vascular diseases				
CVS	PH 1.29 Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure (CHF)	----	----	----	----
	Classify drugs used in CHF. Explain the mechanism of action, pharmacological actions, uses, dose, adverse effects, contraindications and drug interactions of digoxin Explain the pharmacological management of digoxin toxicity Explain the mechanism of action of diuretics, arterial and venodilators in CHF Explain the rationale for use of β blockers in CHF Explain the mechanism of action, uses and adverse effects of Phosphodiesterase-3 inhibitors	√	----	√ IM	----
CVS N	PH 1.30 Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the anti-arrhythmics				
	Classify anti-arrhythmic drugs. Explain mechanism of action, uses dose and adverse effects of the individual drugs Enumerate drugs used in various arrhythmias	√	----	√ IM	----
CVS	PH 1.31 Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in the management of dyslipidemias				
	Classify drugs used in dyslipidemia Explain the mechanism of action, uses, dose and adverse effects of individual drugs used in dyslipidemia	√	----	√ IM	----
	Total hours	5	----	2	----
RS	PH 1.32 Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD				
	List the drugs used in bronchial asthma based on their mechanism of action Explain mechanism of action and adverse effects of individual drugs List the drugs used in prophylaxis of bronchial asthma	----	----	√ CT	----
RS	PH 1.33 Describe the mechanism of action, types, doses, side effects,				

	indications and contraindications of the drugs used in cough (antitussives, expectorants/ mucolytics)				
	Classify drugs used in treatment of cough Explain mechanism of action and adverse effects of demulcents and expectorants, mucolytic agents, cough suppressants Explain general approaches in treatment of cough	----	----	√ CT	----
	Total hours	----	----	2	----
GIT	PH 1.34 Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below:				
	<u>Acid-peptic disease and GERD</u> Classify drugs used in peptic ulcer Explain the mechanism of action, uses, dose, drug interactions and adverse effects of Proton Pump Inhibitors, H2 blockers, colloidal bismuth subcitrate and sucralfate Define antacids. Mention the advantages of combining aluminium and magnesium containing antacids List the drugs used in the management of H. pylori induced peptic ulcer Write the FDA approved regimen for treatment of H. pylori induced peptic ulcer Mention the drugs used in Gastro Esophageal Reflux disorder (GERD) and explain their mechanism of action	----	----	√ IM	----
	<u>Antiemetics and prokinetics</u> List drugs used in vomiting. Explain mechanism of action, uses, dose and adverse effects of individual drugs List drugs used in motion sickness, cancer chemotherapy induced vomiting and postoperative vomiting	√	----	----	----
	<u>Antidiarrhoeals</u> (Drugs used in diarrhea) Explain principles of management of Diarrhoea List components in ORS. Explain their rational in treating dehydration Classify drugs used in treatment of Diarrhoea. Explain mechanism of action and adverse effects of individual drugs	√	----	----	----

	<u>Laxatives</u> (Drugs used in constipation) Define and differentiate between laxatives and purgatives Classify purgatives Explain the mechanism of action, uses, dose, adverse effects and contraindication of bulk purgatives, stool softeners, diphenylmethanes, anthraquinones and osmotic purgatives	√	----	----	----
	<u>Inflammatory Bowel Disease</u> Mention drugs used in ulcerative colitis and Crohn's disease Explain mechanism of action and adverse effects of individual drugs	√	----	----	----
	<u>Irritable Bowel Disorders, Biliary and pancreatic diseases</u> Mention the drugs used in diarrhea predominant and constipation predominant irritable bowel disorder Mention the drugs used in gall bladder stones and explain their mechanism of action	√	----	----	----
	Total hours	3	----	2	----
Endocrine system	PH 1.36 Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)				
	List the drugs used in diabetes mellitus Explain mechanism of action, uses, dose and adverse effects of individual drugs Explain insulin delivery systems	----	----	√ IM	----
	Explain mechanism of action, pharmacological actions, uses and dose of thyroid hormone preparations Classification of antithyroid drugs. Explain mechanism of action, uses, dose and adverse effect of individual drug Explain advantages and disadvantages of Radioactive iodine Explain management of thyroid storm and myxedema coma	√	----	----	----
	Explain pharmacological actions, uses and dose of Parathyroid hormone Mention uses and dose of vitamin D preparations List Bisphosphonates Explain mechanism of action, uses, dose and adverse effects of bisphosphonates	√	----	----	----

	List drugs used in osteoporosis Explain their mechanism of action, uses, dose and adverse effects				
Endocrine system	PH 1.37 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				
	Explain the mechanism of action, uses, dose and adverse effects of bromocriptine List the uses, dose and adverse effects of anterior pituitary hormone preparations List the GnRH agonists and antagonists. Explain their uses, dose and adverse effects	√	----	----	----
	Explain the mechanism of action, pharmacological actions, uses, dose and adverse effects of estrogens, progesterone and androgens. Explain the guidelines in hormonal replacement therapy. List the advantages and disadvantages for it. List the antiestrogens and Selective Estrogen Receptor Modulators (SERMs). Explain mechanism of action, uses, dose and adverse effects of antiestrogens and SERMs. List the aromatase inhibitors, their uses, dose and adverse effects. List the progestins and antiprogestins. Explain the mechanism of action, pharmacological actions, uses, dose and adverse effects of progestins. List the uses, dose and adverse effects of Mifepristone	√	----	----	----
Endocrine system	PH 1.38 Describe the mechanism of action, types, doses, side effects, indications and contraindications of corticosteroids				
	Classify glucocorticoids and mineralocorticoids Explain mechanism of action, pharmacological actions, uses, adverse effects and contraindications of glucocorticoids	√	----	----	----
Endocrine system	PH 1.39 Describe mechanism of action, types, doses, side effects, indications and contraindications the drugs used for contraception				
	Classify hormonal contraceptives Explain the mechanism of action, non contraceptive uses, dose, adverse effects and contraindications for hormonal contraceptive	√	----	√ OBG	----

Endocrine system	PH 1.40 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				
	List the various drugs and drug regimens used in infertility Explain the mechanism of action of individual drug used in infertility Mention drugs used in erectile dysfunction	----	----	√ OBG	----
Endocrine system	PH 1.41 Describe the mechanisms of action, types, doses, side effects, indications and contraindications of uterine relaxants and stimulants				
	List the uterine stimulants Explain mechanism of action, uses and adverse effects of oxytocin, ergometrine and prostaglandin analogues List the uterine relaxants and mention their uses with dose	√	----	√ OBG	----
	Total hours	11	----	4	----
Chemotherapy	PH1.42 Describe general principles of chemotherapy				
	Define the terms – antibiotic, antimicrobial Classify antimicrobials Define and mention the types of antimicrobial drug resistance explain the measures to prevent antimicrobial drug resistance Define superinfection with examples Mention the factors governing choice of an antimicrobial agent Define the terms – minimum inhibitory concentration, post antibiotic effect Define antimicrobial prophylaxis with examples	----	----	√ IM, PE	----
Chemotherapy	PH1.43 Describe and discuss the rational use of antimicrobials including antibiotic stewardship program				
	Explain the strategies to enhance rational use of antibiotics in hospital Explain the rationale for antimicrobial combinations Define antibiotic stewardship program Explain the core elements of hospital antibiotic stewardship program List the drugs used in bacterial infection. Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication	----	----	√ MI	----
	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication to beta lactam antibiotics	√	----	----	----

	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication to aminoglycosides	√	----	----	----
	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication tetracyclines and chloramphenicol	√	----	----	----
	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication to sulfonamides and cotrimoxazole	√	----	----	----
	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication to quinolones	√	----	----	----
	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication to macrolides, lincosamide and glycopeptide	√	----	----	----
	Explain their mechanism of action, spectrum, uses, dose, adverse effects and contraindication to other drugs used in gram positive bacterial infections(Viz Streptogramins, Vancomycin, polymyxin B)	√	----	----	----
Chemotherapy	PH1.44 Describe the first line antitubercular dugs, their mechanisms of action, side effects and doses				
	List drugs used in tuberculosis Explain mechanism of action, indications, pharmacokinetics and adverse effects of first line antitubercular drugs List regimens used in tuberculosis treatment	----	----	√ CT	----
Chemotherapy	PH1.45 Describe the drugs used in MDR and XDR Tuberculosis				
	List the drugs used in MDR and XDR tuberculosis List drugs used in special conditions like tuberculosis with HIV, tuberculosis in pregnancy	----	----	√ CT	----
Chemotherapy	PH1.46 Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs				
	List drugs used in leprosy Explain mechanism of action, uses, dose, contraindications and adverse effects of drugs used in leprosy Explain the regimens used to treat multibacillary and paucibacillary leprosy	----	----	√ DR	----
Chemotherapy	PH 1.47Describe the mechanisms of action, types, doses, sideeffects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis				

	Classify drugs used in malaria Explain the mechanism of action, uses, dose and adverse effects of chloroquine, artemisinin derivatives and quinine Explain the treatment of chloroquine sensitive plasmodium falciparum malaria and vivax malaria, chloroquine resistant plasmodium falciparum, vivax malaria and cerebral malaria	√	----	√ IM	----
	Classify drugs used in amoebiasis. Explain the mechanism of action, uses, dose and adverse effects of drugs used in amoebiasis	√	----	----	----
	Enumerate drugs used in intestinal helminthiasis (round worm infestation, tapeworm infestation, filariasis, pin worm infestation and thread worm infestation) Explain mechanism of action, uses, dose and adverse effects of drugs used in intestinal helminthiasis	√	----	----	----
	Mention drugs used in kala-azar. Explain mechanism of action, uses, dose, contraindication and adverse effects of drugs used in kala-azar	√	----	----	----
Chemotherapy	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				
	Define urinary antiseptics. List the urinary antiseptics Explain mechanism of action, uses, dose and adverse effects of nitrofurantoin and methenamine Mention the general principles in Urinary tract Infection (UTI) treatment Mention the drug regimens used in treatment of Sexually transmitted diseases (STD) treatment caused by bacteria	----	----	----	√
	List drugs used in viral infections Explain the mechanism of action, clinical uses, dose & adverse effects of individual drugs	√	----	----	----
	List various drugs used in HIV treatment Explain mechanism of action, uses, dose and adverse effects of individual drugs Explain AIDS treatment principles and drug regimen for treatment of AIDS	----	----	√ MI	----
Chemotherapy	PH 1.55 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				
	Mention the drugs with their dosage schedule and instructions to report adverse drug reactions used in National Health Programmes	----	----	√ CM	----
Chemotherapy	PH 1.62 Describe and discuss antiseptics and disinfectants				
	Define and differentiate between antiseptics and disinfectants List the properties of an ideal antiseptic/ disinfectant Classify antiseptics and disinfectants. Explain the mechanism of action and uses of each	√	----	----	----
Chemotherapy	PH 1.49 Describe mechanism of action, classes, side effects, indications and contraindications of anticancer drugs				
	Classify drugs used in the treatment of cancer Explain mechanism of action, uses, contraindications and adverse effects of individual class of drugs List the drugs used to ameliorate the toxic effects of anticancer drugs	√	----	----	----
	Total hours	18	----	11	2
Immunology	PH 1.50 Describe mechanisms of action, types, doses, side effects, indications and contraindications of immunomodulators and management of organ transplant rejection				
	Classify immunosuppressants Explain their mechanism of action, uses and adverse effects of immunosuppressants Mention immunostimulants. List their therapeutic applications	√	----	----	----
Immunology	PH 1.54 Describe vaccines and their uses				
	Mention the live attenuated, killed vaccines and toxoids with their indication Mention combined vaccines Mention antisera and immunoglobulin with their uses	√	----	----	----
	Total hours	2	----	----	----
Miscell	PH 1.57 Describe drugs used in skin disorders				
	Define the various terms – demulcents, emollients, adsorbents and protectives, astringents, irritants and counterirritants, caustics and escharotics, keratolytics, antiseborrhics, melanising and demelanising agents, sunscreens with examples	√	----	√ DR	----

	and uses List the various drugs used in psoriasis and their adverse effects List the various drugs used in acne vulgaris and their adverse effects				
Miscell	PH 1.58 Describe drugs used in Ocular disorders				
	Mention ocular lubricants and explain their mechanism of action, uses and adverse effects Mention topical antibacterial, antiviral, antifungal and anti-inflammatory drugs used in ocular conditions with their uses and adverse effects	----	----	----	√ OP
Miscell	PH 1.61 Describe and discuss dietary supplements and nutraceuticals				
	List the various vitamin preparations, their deficiency symptoms and uses List the various minerals used as dietary supplements, their deficiency symptoms and uses Mention the uses and adverse effects of Echinacea, garlic, ginkgo, ginseng, milk thistle, St. John's Wort, saw palmetto Mention nutritional supplements Explain the uses and adverse effects of coenzyme Q10, glucosamine and melatonin	----	----	----	√
	Total hours	1	----	1	4
Toxicology	PH 1.51 Describe occupational and environmental pesticides, food adulterants, pollutants and insect repellents				
	Mention pesticides and herbicides Explain the mechanism of action and treatment of herbicides Mention the food adulterants, their toxic effects and its treatment Mention the air pollutants Explain the manifestations and treatment to exposure to air pollutants (carbon monoxide, sulfur dioxide, nitrogen oxide, ozone, halogenated hydrocarbons, benzene, toluene, xylene exposure) Mention the insect repellents, their toxic effects and its treatment	----	√	----	----
Toxicology	PH 1.52 Describe management of common poisoning, insecticides, common sting and bites				
	Mention the agents which are commonly used for poisoning Explain the clinical features and treatment of atropine, organophosphorus, paracetamol, aspirin, theophylline, barbiturate, diazepam, lithium, morphine,	----	----	√ IM	----

	digoxin, warfarin, poisoning Explain the management of snake bite, scorpion bite and bee sting				
Toxicology	PH 1.53 Describe heavy metal poisoning and chelating agents				
	List the chelating agents Explain the mechanism of action, uses and adverse effects of chelating agents	√	----	----	----
	Total hours	1	1	1	----

PRACTICAL

The entire practical have been categorized as analysis, interpretation, procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. Some of these would be included in the practical during University examination. Those categorized as “Demonstrations” are to be shown to students during practical classes. However, these Demonstrations would not be included in the university examinations, but questions based on these would be given in the form of data, charts, problems and case – histories, for interpretation by students.

Sl. No.	Competencies	Domain K/S/A/C	Level K/KH/SH/P	Core (Yes/No)	Suggested Teaching Learning method	Suggested Assessment method	Vertical Integration (VI)	Horizontal integration (HI)	Hours
1	Clinical Pharmacy PH 1.9, 1.3, 2.1, 2.2, 2.3, 1.12, 2.4	K/S/C	SH	Yes	DOAP SGL	Written/ Viva Voce/ OSPE	-----	-----	16
2	Clinical Pharmacology PH 1.2, 1.4, 1.5, 1.6, 3.4	K/S/C/A	SH	Yes	SGL	Written/ Viva Voce/ OSPE	-----	-----	16
3	Experimental Pharmacology PH 4.1, 4.2	S	SH	Yes	DOAP SGL	Written/ OSPE	-----	-----	09
4	Communication PH 3.8, 5.1, 1.3, 5.2, 5.3, 1.60, 5.4, 1.22, 1.23, 1.59, 5.5, 5.6, 1.63, 5.7	K/S/C/A	SH	Yes	DOAP SGL	Written/ Viva Voce/ OSPE	IM, PS	FM	14

Note

1. DOAP: Demonstrate(by student), Observe, Assist, Perform; SGL: Small Group Learning

Practical: Competencies with Specific Learning Objectives(SLOs) and teaching learning methods(TLM) and assessment methods

Competencies	SLOs At the end of the course, II MBBS student should be able to	TLM	Hours and Integration	Method of Assessment
CLINICAL PHARMACY		16 hours		
PH 1.9 Describe nomenclature of drugs i.e. generic, branded drugs	Explain the nomenclature of drugs with examples	SGL	2 hours	Viva-Voce
PH 1.3 Enumerate and identify drug formulations	Enumerate types of drug formulations and drug delivery device with examples	Instructions with Video	10 hours	OSPE
PH 2.1 Demonstrate understanding of the use of various dosage forms (oral/local/parenteral; solid/liquid)	Identify a specific formulation/device from a given set Eye drops, ear drops, rotahaler, nebulizer, nasal drops and spray, insulin pens	Demonstration and video		
PH 2.2 Prepare oral rehydration solution from ORS packet and explain its use PH 2.3 Demonstrate the appropriate setting up of an intravenous drip in a simulated environment	Demonstrate the preparation of ORS solution and instructs the use of the same to parent/guardian of the child Set up a dopamine infusion by using an appropriate syringe to draw required quantity of dopamine with aseptic precautions	DOAP	2 hours	OSPE
PH 1.12 Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal dysfunction PH 2.4 Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations	Mention the formulae used to calculate dose in adults, children and special situations Calculate the dose of a drug using a formulae 1. Parenteral iron; 2. Dopamine in shock; 3.Children:Paracetamol in a child suffering with fever (Clarks formulae) 4.Renal impairment: Aminoglycosides based on creatinine clearance	SGL	2 hours IM, PE	OSPE and Viva-Voce

CLINICAL PHARMACOLOGY		16 hours		
PH 1.4 Describe absorption and distribution of drugs	Clinical Pharmacokinetics a. Bioavailability b. Vd and Plasma half-life	Graph plotting SGL	4 hours	OSPE
PH 1.2 Describe the basis of Therapeutic drug monitoring	Define Therapeutic Index Calculate therapeutic index (Graph plotting) using formula Define therapeutic drug monitoring List the indications for therapeutic drug monitoring Mention methods to estimate drug levels	Graph plotting SGL	2 hrs	OSPE
PH 1.5 Describe general principles of mechanism of drug action	Explain types of drug antagonism	Graph plotting SGL	4 hrs	OSPE
PH 1.6 Describe principles of Pharmacovigilance & Adverse Drug Reactions (ADR) reporting systems PH 3.4 To recognize and report an adverse drug reaction	Define Pharmacovigilance Explain WHO causality assessment Identify the adverse drug reaction from the given photograph To fill the suspected ADR reporting form for the given case scenario and drug sample	DOAP - Filling ADR forms	6 hrs	OSPE Viva-Voce
EXPERIMENTAL PHARMACOLOGY		09 hours		
PH 4.1 Administer drugs through various routes in a simulated environment using mannequins	Hands on – a. Intravenous, b intramuscular, c. subcutaneous Demonstrate intrathecal route of administration	DOAP Skill lab	2 hrs	OSPE
PH 4.2 Demonstrate the effects of drugs on blood pressure (vasopressor and vaso-depressors with appropriate blockers) using computer aided learning	Computer aided learning using software Document in record as discussion charts	Computer aided learning lab SGL	7 hrs	OSPE

COMMUNICATION		14 hours		
PH 5.1 Communicate with the patient with empathy and ethics on all aspects of drug use	To explain the dose, dosage schedule, cost, adverse effects of drugs and follow up dates to patients with epilepsy and migraine	DOAP	1 hour IM	OSPE
PH 3.8 Communicate effectively with a patient on the proper use of prescribed medication PH 5.2 Communicate with the patient regarding optimal use of a) drug therapy, b) devices and c) storage of medicines	To demonstrate and instruct the subject regarding the use of Oral Contraceptive Pills Explain the features of steroid card/insulin usage to the patient Instruct and demonstrate steps to use Meter Dose Inhaler (MDI) Instruct proper storage and use of insulin Explain the precautions to be taken for the storage and use of ciprofloxacin eye drops	DOAP	4 hours	OSPE
PH 5.3 Motivate patients with chronic diseases to adhere to the prescribed management by the health care provider	Counsel the patient to take medications everyday and come for follow up regularly and also do investigations as suggested by the doctor for hypothyroidism and tuberculosis	DOAP	1 hour	OSPE
PH 1.60 Describe and discuss Pharmacoeconomics PH 5.4 Explain to the patient the relationship between cost of treatment and patient compliance	Define Pharmacoeconomics and patient compliance Pharmacoeconomic problems- CHF, Myocardial infarction, Hypertension	SGL	2 hours IM	OSPE Viva-Voce
PH 1.22 Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences) PH 1.23 Describe the process and mechanism of drug	Define dependence, addiction and tolerance Explain the pharmacological basis of drug dependence and abuse List drugs of abuse. Explain their manifestations and treatment Explain the management of addiction	SGL	2 hours PS, FM	Viva-Voce

deaddiction PH 5.5 Demonstrate an understanding of the caution in prescribing drugs likely to produce dependence and recommend the line of management	due to opioids, Lysergic acid diethylamide (LSD), nicotine and amphetamines			
PH 1.59 Describe and discuss Over the counter (OTC) drugs PH 5.6 Demonstrate ability to educate public & patients about various aspects of drug use including drug dependence and OTC drugs	List the medications available over the counter Explain the disadvantages of OTC drugs Explain the measures to minimize OTC drug utilization and the advantages Rational use of antimicrobials, analgesics and CNS depressants	SGL	2 hours PS	OSPE Viva-Voce
PH 1.63 Describe Drug Regulations, acts and other legal aspects PH 5.7 Demonstrate an understanding of the legal and ethical aspects of prescribing drugs	Explain the acts of Food, Drug and Cosmetic Act, functions of Drug Controller General of India (DCGI), CDSCO Explain the importance of drug schedules Explain schedule H, X, G, J, K, C, FF and Y	SGL	2 hours FM	Viva-Voce
COMPETENCIES TO BE DOCUMENTED IN LOG BOOK		04 hours		
PH 1 .10 Describe parts of a correct, complete and legible generic prescription. Identify errors in prescription and correct appropriately	Explain the format of writing a prescription Prescribe an appropriate drug for a given situation Identify, correct and rewrite the prescription provided	Along with 3.1 and 3.2 (Certifiable skills)	-----	OSPE Documentation in log book
PH 3.6 Demonstrate how to optimize interaction with pharmaceutical representative to get authentic information on drugs	Interact with the Pharmaceutical representative and obtain the information related to the medication/s	SGL	2 hours	Documentation in log book

PH 3.7 Prepare a list of essential medicines for a healthcare facility PH 1.59 Describe and discuss Essential medicines	Define the term essential medicines List the WHO criteria for selection of essential medicine	SGL	2 hours	Documentation in log book

Note

PY – Physiology; MI – Microbiology; FM – Forensic Medicine & Toxicology; CM – Community Medicine; PE – Pediatrics
IM – General Medicine; CT – Respiratory Medicine; PS – Psychiatry; AS – Anesthesiology; OP - Ophthalmology
DR – Dermatology, Venereology, Leprosy; OG – Obstetrics and Gynaecology

Certification of skills

List and number of sessions for skill certification:

Competency	Number required to certify	Hours (Each session = 1 hr)
PH 3.1 Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient	5	10
PH 3.2 Perform and interpret a critical appraisal (audit) of a given prescription	3	06
PH 3.3 Perform a critical evaluation of the drug promotional literature	3	06
PH 3.5 To prepare and explain a list of P-drugs for a given case/condition	3	06

Note: Learners must have completed the required certifiable competencies for that phase of training to be eligible for appearing at the final university examination of that subject.

***Learners must update the log book appropriate for that phase of training to be eligible for appearing in the final university examination of that subject.**

Aligned and Integrated topics(AITO)

****Alignment and Integration Module for Undergraduate Medical Education Program, 2019: pp 1- 34**

Sl No.	Pharmacology
1	Diabetes mellitus
2	Tuberculosis
3	Ischemic heart disease

Assessment for AITo will be subject based.

AETCOM

***Attitude, Ethics and Communication (AETCOM) Competencies” for the Indian Medical Graduate 2018

Learning modules for Professional Year II

Number of modules: 8; Number of hours: 37

Two modules of the AETCOM as prescribed in the MCI AETCOM booklet will be conducted by department of Pharmacology is given below :

1. Module 2.1: The foundations of communication – 2 (5 hours)

Competencies addressed:

The student should be able to:	Level
Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non- judgmental and empathetic manner	KH

2. Module 2.8: What does it mean to be family member of a sick patient? (6 hours)

Competencies addressed

The student should be able to:	Level
Demonstrate empathy in patient encounters	KH

Module on Pandemic Management, August 2020

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Phase II	2.5	Therapeutic strategies including new drug development	6	Pharmacology, General Medicine

Competencies addressed:

The student should be able to:	Level
Describe and discuss the various phases of drug trials	KH
Prepare a plan for evaluation of off label use of a drug	SH
Organise pharmaco-vigilance activities	SH
Discuss ethical aspects of clinical trials in pandemics	SH

TEACHING HOURS AND METHODS

Total number of hours: 230

Subject	Theory Didactic lectures hours	Small group learning (Practical/Tutorial) + Seminar + Integrated teaching hours	Self directed learning hours	Total hours
Pharmacology	80	87+5+46=138	12	230
AETCOM Attitude Ethics Communication	--	09	02	11

Note: The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing the interaction between drug, host and disease in order to provide an overall understanding of the context of therapy

SCHEME OF EXAMINATION

***Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019: pp 1-29.

I. Eligibility to appear for Professional (University) examinations as per Regulations in Graduate Medical Education Regulations 2019

1. **Attendance:** 75% in theory and 80% in practical (including tutorial, student seminar, integrated teaching and SDL) for eligibility to appear for the University examination in that subject.
2. **Internal Assessment:** Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
- c. Regular periodic examinations shall be conducted throughout the course. There shall be three internal assessment examinations in subject Pharmacology.
- d. Learners must secure at least **50% marks of the total marks** (combined in theory and practical; not less than **40 % marks in theory and practical separately**) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination. The results of internal assessment should be displayed on the notice board within 1-2 weeks of the test.

- e. Criteria for calculating Internal Assessment eligibility marks for appearing MBBS Phase-II examinations for the students admitted from the academic year 2019-20 onwards are as follows.

Theory	Marks	Practical	Marks
Internal Assessment Examination including MCQs	80	Internal Practical Examination	50
Periodic Assessments Tests	20	Viva- Voce	20
		Logbook and Record Book	10+10
		Professionalism	05
		AETCOM	05
Total Marks	100		100

- f. There shall be no less than three internal assessment examination and the final internal assessment will be as per university pattern.
- g. Average marks of all three notified theory internal assessment examinations (IAE) will be reduced to 80. Average marks obtained from Periodic Assessment Tests (Marks 20) will be added to IAE. The sum of IAE and PAT for 100 marks will be sent to the University. Average marks of the three practical IAE including viva-voce will be calculated for 70. The marks obtained for Logbook (10 marks), Record Book (10 marks), Professionalism (05 marks) and AETCOM (05 marks) will be added to practical IAE marks and the marks obtained for 100 will be sent to University.
3. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.
4. 75% attendance in Professional Development Programme (AETCOM Module) is required for eligibility to appear for final examination in each professional year.

II. Internal Assessment examination: 200 (Theory 100 and Practical 100) Marks

Theory: 100 marks

Minimum of three internal assessments (IA) will be conducted at the end of each module for 100 marks and the final internal assessment will be as per university pattern. Average marks of all three notified theory internal assessment examinations (IAE) is taken into consideration for calculating the final internal assessment marks. Marks obtained by Periodic Assessment tests like Quiz, PCT, MCQs, will be added to theory internal marks.

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	1	20
Long Essay Questions	2	10	20
Short Essay Questions	6	5	30
Reasoning Questions / Short Answer Questions	10	3	30
Total marks			100

Note:

- Case Based Questions: 20% of total marks.
- Two questions based on integration (AITo) in Internal Assessment Examination and one question from AETCOM.
- A student who has not taken minimum required number of tests for Internal Assessment, each in theory and practical will not be eligible for University examinations.
- The results of Internal Assessment should be displayed on notice board within 2 weeks of the test and an opportunity to be provided to the students to discuss the results and get feedback on making their performance better.
- The third internal examination in Paraclinical subjects should be prelim or pre-university examination.
- Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Practical and Viva: 100 Marks

Three practical assessments and viva-voce will be conducted along with the Theory Internal Assessments. Average marks of the three practical IAE and viva-voce will be considered for calculating the final internal assessment marks. The marks obtained for Logbook, Record Book, Professionalism and AETCOM will be added to practical IAE marks. Objective Structured Practical Examination will be a method of assessment in Internal Assessment and Summative examination.

III. University Examination**A. Theory: 200 Marks**

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be as follows.

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	01	20
Long Essay Questions	02	10	20
Short Essay Questions	06	05	30
Short Answer Questions (Reasoning and Applied Pharmacology)	10	03	30
Total marks			100

- Case Based Questions: 20% of total marks.
- Two questions based on integration (AITo) and one question from AETCOM.

Distribution of chapters/topics for paper I and II with weightage of marks for University Examination is given below:

PAPER – I	
Topics	Marks
General Pharmacology (GP) including AETCOM	15
Autonomic Nervous System (ANS), Peripheral Nervous System (PNS)	25
Central Nervous System (CNS)	25
Cardio Vascular System (CVS)	20
Renal System (Diuretics and Antidiuretics)	05
Blood	10
Total	100
PAPER – II	
Topics	Marks
Autacoids and related drugs	10
Respiratory system (RS)	05
Gastrointestinal system (GIT)	10
Endocrine system	25
Chemotherapy	40
Immunology	05
Miscellaneous and Toxicology	05
Total	100

Table of specification

Chapter wise distribution of types of Questions and Marks will be as under and the pattern of questions would be of three types

PAPER – I

Chapter/Topic	Type and No. of Questions	Marks 100
General Pharmacology, Autonomic Nervous System, Central Nervous System, Cardiovascular System	Long Essay 2X10	20
General Pharmacology, Autonomic Nervous System, Peripheral Nervous System, Central Nervous System, Cardiovascular System, Renal system, Blood	Short Essay 6X5	30
General Pharmacology including AETCOM, Autonomic Nervous System, Peripheral Nervous System, Central Nervous System, Cardiovascular System, Renal system, Blood	Short Answer 10X3	30
General Pharmacology, Autonomic Nervous System, Peripheral Nervous System, Central Nervous System, Cardiovascular System, Renal system, Blood	MCQs 20X1	20

PAPER—II

Chapter/Topic	Type and No. of Questions	Marks 100
Respiratory System, Gastro Intestinal System, Endocrine System, Chemotherapy	Long Essay 2X10	20
Autacoids, Respiratory System, Gastro Intestinal System, Endocrine System, Chemotherapy, Immunology	Short Essay 6X5	30

Autacoids, Respiratory System, Gastro Intestinal System, Endocrine System, Chemotherapy, Immunology, Miscellaneous and toxicology	Short Answer 10X3	30
Autacoids, Respiratory System, Gastro Intestinal System, Endocrine System, Chemotherapy, Immunology, Miscellaneous and toxicology	MCQs 20X1	20

B. Practical: 80 Marks

OSPE pattern practical examination will be conducted. The distribution of content and marks for the practical is as follows:

Psychomotor skills

1. Preparation of Oral Rehydration Salt Solution
2. Setting up dopamine infusion
3. Intravenous drug administration
4. Intramuscular drug administration
5. Subcutaneous drug administration

Communication skills

1. Pharmacoeconomics problems
2. Empathy and ethics in drug use
3. Optimal use of drug therapy, devices and storage of medicines
4. Medication adherence
5. Over the counter drugs

Writing exercises

1. Dosage forms
2. Dose calculation in special situations
3. Graph plotting of Pharmacokinetic parameters
4. Pharmacovigilance problems
5. Discussion charts
6. Clinical problems
7. Prescription writing

C. Viva-Voce Examination: 20 Marks

The viva-voce examination shall carry 20 marks and all examiners will conduct the examination.

All the four examiners will examine all the candidates

Topics	Marks
General Pharmacology, Peripheral Nervous System, Central Nervous System, Autacoids	05
Autonomic Nervous System, Cardiovascular System, Blood, Renal System	05
Endocrine System, Gastrointestinal system, Respiratory System	05
Chemotherapy, Immunology, Miscellaneous, Toxicology	05

Examination components and distribution of marks

A.	University Theory Examination	Marks
1.	Paper I	100
	Paper II	100
	Total Theory	200
B.	University Practical Examination	
1.	Practical	80
2.	Viva – voce	20
	Total Practical	100
C.	Internal Assessment Examination (IAE)	
1.	Internal assessment (Theory)	100
2.	Internal assessment (Practical)	100
	Total IAE	200
	Grand total	500

Criteria for passing university examination

- The student must **secure at least 40% marks in each of the two theory papers** with **minimum 50% of marks in aggregate** (both papers together) to pass.
- The marks obtained in the viva examination will be added to the practical marks.
- The student **must secure a minimum of 50% of marks in aggregate in the viva and practical examination** (both combined) to pass.
- A candidate shall obtain 50% marks in University conducted examination separately in Theory and Practical (Practical includes: practical and viva voce) in order to be declared as passed in that subject.
- Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.

RECOMMENDED BOOKS

THEORY

1. K.D. Tripathi. Essentials of Medical Pharmacology. 8th Edition, 2019 M/s. Jaypee Brothers Medical Publishers (P) Ltd, 4838/24, Ansari Road, Daryaganj, New Delhi.
2. R.S. Satoskar, Nirmala N Rege, S.D. Bhandarkar. Pharmacology and Pharmacotherapeutics. 25th Edition, 2017, Elsevier Health Reed Elsevier India Pvt. Ltd. 14th Floor, Building No. 10B, DLF Cyber City, Phase II, Gurgaon (Haryana) India

PRACTICAL

1. Ramesh KV, Shenoy A, Chowta MN. Practical Pharmacology for MBBS. 1st edition 2006, Avichal publishing company, Ambala

REFERENCE BOOKS

THEORY

1. Peter N Bennet, Morris J Brown, Pankaj Sharma. Clinical Pharmacology, 12th Edition, 2019. Churchill Livingstone, Elsevier Ltd, Edinburgh.
2. Bertram G Katzung, Anthony J Trevor. Basic and Clinical Pharmacology, 14th Edition, 2018, McGraw-Hill, Education Private Limited, India.
3. S.D. Seth Textbook of Pharmacology, 3rd Edition, 2008. Reed Elsevier Pvt Ltd.
4. Brunton LL, Chabner BA, Knollmann, Björn CK. Goodman & Gilman's The Pharmacological basis of Therapeutics, 13th Edition (International Edition), 2018. McGraw-Hill, New York
5. Ritter J, Flower R, Henderson G, Loke YK, MacEvan D, Rang H. Rang and Dale's Pharmacology, 9th edition 2019, Elsevier Churchill Livingstone, Elsevier Ltd, Edinburgh.
6. Gupta RC. Nutraceuticals: Efficacy, Safety and Toxicity, 1st Edition, 2016, Elsevier

PRACTICAL

1. B.P. Jaju, Pharmacology Practical Exercise Book, Jayapee Brothers, P.B. No:719 G-16 EMCA house, 23/23, B.Ansari Road, Daryaganj, New Delhi.
2. Bikash Medhi, Ajay Prakash. Practical manual of Experimental and Clinical Pharmacology. 2nd edition 2017 Jaypee brothers, New Delhi.
3. Avijit Hazra, Nirmala N Rege. Precise practical Pharmacology, 1st Edition, 2014. Wiley India Pvt Ltd.

AETCOM

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2004.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, : 956. Medical Council of India, Kotla Road, New Delhi
3. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; 76:390-3.
4. Hausberg M. Enhancing medical students' communication skills: development and evaluation of an undergraduate training program. BMC Medical Education 2012;12:16

MICROBIOLOGY

Competencies: The undergraduate learner demonstrate:

1. Understanding of role of microbial agents in health and disease,
2. Understanding of the immunological mechanisms in health and disease,
3. Ability to correlate the natural history, mechanisms and clinical manifestations of infectious diseases as they relate to the properties of microbial agents,
4. Knowledge of the principles and application of infection control measures,
5. An understanding of the basis of choice of laboratory diagnostic tests and their interpretation, antimicrobial therapy, control and prevention of infectious diseases.

Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems with emphasis on host-microbe-environment interactions and their alterations in disease and clinical correlations so as to provide an overall understanding of the etiological agents, their laboratory diagnosis and prevention.

GOAL:

To make MBBS students knowledgeable about the natural history of infectious diseases and to apply the concepts of microbiology such as etiology, pathogenesis, laboratory diagnosis, treatment and prevention of infections in the patients and the community.

COURSE OBJECTIVES.

Knowledge:

The MBBS student at the end of microbiology course should be able to:

1. Describe the normal microbial flora and its importance in health and disease
2. Describe the etiology and pathogenesis of common infectious diseases
3. Choose appropriate laboratory investigations to confirm the clinical diagnosis of infectious diseases
4. Select appropriate antibiotics and chemotherapeutic agents for the treatment
5. Draw up a plan to prevent microbial infections using vaccines, chemoprophylaxis and other measures
6. Explain the mechanisms of immunity to infections
7. Explain the immunopathological mechanisms of diseases
8. Identify and report notifiable infectious diseases to the concerned public health authorities
9. Explain the epidemiological and microbiological basis of National health programmes for the prevention of communicable diseases
10. Identify the microbial ecology of specialized areas like hospital, water, food and prevent the possible spread of infections.

Skill:

The MBBS student at the end of microbiology course should be able to:

1. Follow Standard precautions during health care activities
2. Collect appropriate clinical samples and transport them promptly to the laboratory
3. Perform simple point of care microbiological tests which help to arrive at rapid diagnosis
4. Interpret the cultural and serological reports
5. Apply appropriate method of sterilization, disinfection and disposal of biomedical waste to control and prevent hospital and community acquired infections

COURSE CONTENTS:

*** MI- 1.1 where first two alphabets MI represents subject Microbiology and number following alphabet reflects topic number.**

SL. NO.	COMPETENCIES	CORE	NON CORE	HOURS
1	General Microbiology & Immunity	✓		12
2	CVS & Blood	✓		11
3	Gastrointestinal & Hepatobiliary system	✓		09
4	Musculoskeletal system and Soft tissue infections	✓		07
5	Central Nervous System infections	✓		04
6	Respiratory tract infections	✓		05
7	Genitourinary & Sexually Transmitted infections	✓		06
8	Zoonotic diseases & Miscellaneous	✓		16
	Total			70

PRACTICALS				
Number	COMPETENCY The student should be able to	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P
MI1.2	Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy	DOAP session	Skill assessment	5
MI2.3	Identify the microbial agents causing Rheumatic Heart Disease & infective Endocarditis	DOAP session	Skill assessment	-
MI2.6	Identify the causative agent of malaria and filariasis	DOAP session	Skill assessment	-

MI3.2	Identify the common etiologic agents of diarrhea and dysentery	DOAP session	Skill assessment	-
MI3.4	Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness	DOAP session	Skill assessment	-
MI5.3	Identify the microbial agents causing meningitis	DOAP session	Skill assessment	-
MI6.2	Identify the common etiologic agents of upper respiratory tract infections (Gram Stain)	DOAP session	Skill assessment	3
MI6.3	Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain)	DOAP session	Skill assessment	3
MI8.7	Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)	DOAP session	Skill assessment	3 each in (Hand hygiene & PPE)
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	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	DOAP session	Skill assessment	-
MI8.14	Demonstrate confidentiality pertaining to patient identity in laboratory results	DOAP session	Skill assessment	-

Module on Pandemic Management, August 2020

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Phase II	2.1	Infection Control: Part II Air borne precautions Contact Precautions Infection Control Committee	4	Microbiology
	2.3	Sample Collection, Microbial diagnosis, Serologic tests and their performance parameters	6	Microbiology

2.1 Competencies addressed

The student should be able to:	Level
Describe and discuss the implementation of airborne and contact precautions in a specific clinical situation	KH
Describe and discuss the functioning of institutional Infection Control Committee	KH

2.3 Competencies addressed

The student should be able to:	Level
Describe specimen selection, collection, transportation & storage requirement during a pandemic.	KH
Choose and collect the most appropriate clinical sample in a suitable container at the most appropriate time from a suspected case during pandemic (or in a simulated environment).	SH
Demonstrate appropriate safety measures in handling and processing of clinical specimens (use of PPE etc.)	SH
Discuss various diagnostic modalities available for an infectious disease. Explain sensitivity, specificity, positive predictive value & negative predictive value of each of the diagnostic test/modality.	KH
Chose the most appropriate diagnostic test keeping in mind sensitivity, specificity, positive & negative predictive value of the diagnostic test/modality available.	SH

Certifiable Skills

Number	List of Certificate Skills	Number of times for certification
1	Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy	5
2	Identify the common etiologic agents of upper respiratory tract infections (Gram Stain)	3
3	Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain)	3
4	Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)	3 each in (Hand hygiene & PPE)

***Learners must have completed the required certifiable competencies for that phase of training to be eligible for appearing at the final university examination of that subject.**

LOG BOOK:

Logbook helps the student in maintaining a record of:

- Periodic assessment tests
- Certifiable skills
- Self-directed learning,
- Reflections of AETCOM module
- Feedback.

***Learners must update the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.**

Aligned and Integrated topics(AITO)

Medical Council of India. Alignment and Integration Module for Undergraduate Medical Education Program, 2019: pp 1- 34

- Anemia
- Jaundice
- Diabetes
- Thyroid Diseases
- Nutrition
- Febrile Illness
- Tuberculosis
- Malaria
- Diarrhoea
- Ischemic Heart Disease
- Polycystic Ovarian Syndrome

***Assessment for AITo will be subject based.**

AETCOM:

“Medical Council of India, Attitude, Ethics and Communication (AETCOM) Competencies” for the Indian Medical Graduate 2018

First two modules of the AETCOM as prescribed in the MCI AETCOM booklet will be conducted as given below:

Module 2.3 Health care as a right

Competencies addressed:

The student should be able to:	Level
Describe and discuss the role of justice as a guiding principle in patient care	KH

Module 2.4: Working in a health care team

Competencies addressed

The student should be able to:	Level
Demonstrate ability to work in a team of peers and superiors	KH
Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers	KH

***There should be at least one short question from AETCOM in each subject**

TEACHING HOURS AND METHODS:

1. Total Number of Hrs : 190

Theory Didactic Lectures	70 hours
SGT/practicals/tutorials/integrated learning	110 hours
SDL	10 hours
Total	190 hours

2. System wise distribution of Teaching Hours :

Sl. No.	System	No. of Hrs.
1	General Microbiology and Immunity	12
2	CVS and Blood	11
3	Gastrointestinal and hepatobiliary system	09
4	Musculoskeletal system skin and soft tissue infections	07
5	Central Nervous System infections	04
6	Respiratory tract infections	05
7	Genitourinary & Sexually transmitted infections	06
8	Zoonotic diseases and miscellaneous	16

Classes may be coordinated and integrated with relevant departments on various topics as scheduled below.

3. TEACHING LEARNING METHODS:

- Didactic lectures
- Small group discussion
Practical including demonstrations
- Problem based exercises.
- Objective Triggered Learning
- Self-directed learning
- Integrated teaching at horizontal & vertical levels
- E-modules

4. METHODS OF ASSESSMENT:

- essay question
- Short notes questions.

- MCQs
- Problem solving exercises
- OSPE
- Open Book tests
- Part Completion test
- Records Review
- Quiz
- Assignment
- Oral Viva Voce

5. LEARNING RESOURCE MATERIALS:

- Text books
- Reference books
- Practical note books
- Internet resources

SCHEME OF EXAMINATION

***Competency Based Assessment Module for Undergraduate Medical Education Training program, 2019: pp 1-29.

IV. Eligibility to appear for Professional (University) examinations as per Regulations in Graduate Medical Education Regulations 2019

5. **Attendance:** 75% in theory and 80% in practical (including tutorial, student seminar, integrated teaching and SDL) for eligibility to appear for the University examination in that subject.
6. **Internal Assessment:** Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
- h. Regular periodic examinations shall be conducted throughout the course. There shall be three internal assessment examinations in subject microbiology
- i. Learners must secure at least **50% marks of the total marks** (combined in theory and practical; not less than **40 % marks in theory and practical separately**) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination. The results of internal assessment should be displayed on the notice board within a 1-2 weeks of the test.
- j. Criteria for calculating Internal Assessment eligibility marks for appearing MBBS Phase-II examinations for the students admitted from the academic year 2019-20 onwards are as follows

Theory	Marks	Practical	Marks
Internal Assessment Examination including MCQs	80	Internal Practical Examination	50
Periodic Assessments Tests	20	Viva- Voce	20
		Logbook and Record Book	10+10
		Professionalism	05
		AETCOM	05
Total Marks	100		100

- k. There shall be no less than three internal assessment examination and the final internal assessment will be as university pattern.
- l. Average marks of all three notified theory internal assessment examinations (IAE) will be reduced to 80. Average marks obtained from Periodic Assessment Tests (Marks 20) will be added to IAE. The sum of IAE and PAT for 100 marks will be sent to the University. Average marks of the three practical IAE including viva-voce will be calculated for 70. The marks obtained for Logbook (10 marks), Record Book (10 marks), Professionalism (05 marks) and AETCOM (05 marks) will be added to practical IAE marks and the marks obtained for 100 will be sent to University.
7. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.
8. 75% attendance in Professional Development Programme (AETCOM Module) is required for eligibility to appear for final examination in each professional year.

V. Internal Assessment examination: 200 (Theory 100 and Practical 100) Marks

Theory: 100 marks

Minimum of three internal assessments (IA) will be conducted at the end of each module for 100 marks. Average of the Three IA marks is taken into consideration for calculating the final internal assessment marks. Marks obtained by Periodic Assessment tests like Quiz, PCT, MCQs, will be added to theory internal marks.

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions*	20	1	20
Long Essay Questions**	2	10	20
Short Notes***	6	5	30
Reasoning Questions	10	3	30
Total marks			100

*MCQ to be case scenario based

****One question to be case based**

*****Two questions based on integration (AITo) in Internal Assessment Examination and one question from AETCOM**

Note:

- A student who has not taken minimum required number of tests for IA each in theory and practical will not be eligible for University examinations.
- The results of IA should be displayed on notice board within 2 weeks of the test and an opportunity to be provided to the students to discuss the results and get feedback on making their performance better.
- The third internal examination in Paraclinical subjects should be prelim or pre-university examination.
- 20% of the Internal assessment will be by MCQ
- Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Practical and Viva: 100 Marks

Three practical assessments will be conducted along with the Theory Internal Assessments. Average of the three will be taken. Record maintenance and logbook assessed will be added to practical. Professionalism will be a separate assessment & marks obtained are added to practical. Objective Structured Practical examination will be a method of assessment in Internal Assessment and Summative examination.

VI. University examination

A. Theory: 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be of three types.

Type of Questions	Number of questions	Marks for each question	Total
MCQ	20	1	20
Long essay questions*	2	10	20
Short Essay types	06	05	30
Short answer questions	10	03	30
Total marks			100

*One question to be case based

At least one short essay question from AETCOM in each subject

Distribution of chapters/topics for paper I and II with weightage of marks for University Examination is given below:

PAPER – I	
Topics	Marks
General Microbiology & Immunity	35
CVS & Blood	25
Gastrointestinal & Hepatobiliary system	25
Musculoskeletal system and Soft tissue infections	15
Total :	100
PAPER – II	
Topics	Marks
Central Nervous System infections	15
Respiratory tract infections	20
Genitourinary & Sexually transmitted infections	20
Zoonotic diseases and miscellaneous	45
Total :-	100

Table of specification

Chapter wise distribution of types of Questions and Marks will be as under and the pattern of questions would be of three types

PAPER – I

Chapter/Topic	Type and No. of Questions	Marks 100
General Microbiology & Immunity CVS & Blood Gastrointestinal & Hepatobiliary system Musculoskeletal system and Soft tissue infections	Long Essay 2X10	20
General Microbiology & Immunity CVS & Blood Gastrointestinal & Hepatobiliary system Musculoskeletal system and Soft tissue infections	Short Essay 10X5	30
General Microbiology & Immunity CVS & Blood Gastrointestinal & Hepatobiliary system Musculoskeletal system and Soft tissue infections	Short Answer 10X3	30

PAPER—II

Chapter/Topic	Type and No. of Questions	Marks 100
Central Nervous System infections Respiratory tract infections Genitourinary & Sexually transmitted infections Zoonotic diseases and miscellaneous	Long Essay 2X10	20
Central Nervous System infections Respiratory tract infections Genitourinary & Sexually transmitted infections Zoonotic diseases and miscellaneous	Short Essay 10X5	50
Central Nervous System infections Respiratory tract infections Genitourinary & Sexually transmitted infections Zoonotic diseases and miscellaneous	Short Answer 10X3	30

*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

B. Practical: 80 Marks : OSPE STATIONS

C. Viva-Voce Examination: 20 Marks

The viva-voce examination shall carry 20 marks and all examiners will conduct the examination.

All the four examiners will examine all the candidates

Topics	Marks
General Microbiology & Immunity	05
CVS & Blood Gastrointestinal & Hepatobiliary system Musculoskeletal system and Soft tissue infections	05
Central Nervous System infections Respiratory tract infections Genitourinary & Sexually transmitted infections	05
Zoonotic diseases and miscellaneous	05

Examination components and distribution of marks

A.	University Theory Examination	Marks
3.	Paper I Paper II	100 100
	Total Theory	200
B.	University Practical Examination	
2.	Practical	80

4.	Viva – voce	20
	Total Practical	100
C.	Internal Assessment Examination (IAE)	
3.	Internal assessment (Theory)	100
4.	Internal assessment (Practical)	100
	Total IAE	200
	Grand total	500

Criteria for passing university examination

- The student must **secure at least 40% marks in each of the two theory papers** with **minimum 50% of marks in aggregate** (both papers together) to pass.
- The marks obtained in the viva examination will be added to the practical marks.
- The student **must secure a minimum of 50% of marks in aggregate in the viva and practical examination** (both combined) to pass.
- Students must secure at least 50% marks of the total marks (combined in theory & practical) assigned for Internal assessment to be declared successful at the final university examination of that subject.
- Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.

RECOMMENDED BOOKS (Recent editions)

1. Arti Kapil editor. AnanthNarayan and Paniker's Textbook of Microbiology.
2. 9th ed. Orient Longman, Chennai, India; 2013
3. Baveja CP. Textbook of Microbiology 3rd ed. Arya Publications, New Delhi, India; 2015
4. Baveja CP and Baveja V. Medical Parasitology. 3rd ed. Arya Publications, New Delhi, India; 2015
5. Greenwood D, Slack RCB, Pentherer JF, editors. Medical Microbiology. 16th ed. ELST- Churchill Livingstone,Edinburgh;2002
6. Brooks GF, Carroll KC, Butel JS, Morse SA. Jawetz, Melnick&Adelberg's Medical Microbiology. 24th ed. Appleton and Lange, London; 2007
7. Chatterjee K D. Parasitology.12th ed. Chatterjee Medical Publishers, Calcutta,India; 1980
8. Chakraborty P.Textbook of Medical Parasitology. 1sted. New Central Book Agency, Kolkata, India; 2004
9. Jayaram CKJ. Medical Parasitology.4th ed. Jaypee, New Delhi, India; 1997
10. Surinder kumar,Textbook of Microbiology. 1sted.Jaypee brothers, New Delhi;2012
11. ApurbaSankar Sastry. Essentials of Medical Parasitology. 1st ed.Jaypee brothers, New Delhi ; 2014.
12. Rajesh Karyakarte. Medical Parasitology.3rd ed. Arunabha Sen,Kolkata 2012

**Competency Based Medical Education Curriculum
(II MBBS Phase II and III MBBS Phase III Part I)**

FORENSIC MEDICINE AND TOXICOLOGY

Forensic Medicine and Toxicology

Preamble

The broad goal of teaching undergraduate students in Forensic Medicine and Toxicology is to produce a basic physician who is aware of medical and legal responsibilities in the practice of primary and secondary care medicine. The student must also be capable of making observations and use logical thinking to set enquiries on the possible track in criminal matters and medico legal problems. He/she must be aware of the laws in relation to medical practice and medical negligence, and acquire knowledge regarding codes of conduct and medical ethics. He/she must be able to manage medical and legal issues in cases of poisoning/overdose.

Learning Objectives

At the end of the course in Undergraduate Forensic Medicine & Toxicology, the Indian Medical Graduate should be able to

1. Identify, examine and prepare report or certificate in medico legal cases/situations in accordance with the law of the land, with particular emphasis on maintenance of medico legal registers such as accident register, is séance of wound certificate, drunkenness certificate, death certificate, sickness and fitness certificate, etc., estimation of age by physical, dental and radiological examination and issuance of certificate, examination of victim/accused and issuance of certificate in sex-related offences.
2. Performmedicolegalpostmortemexaminationandreasonablyinterpretautopsyfindings, as well as the results of other relevant investigations to logically conclude the cause, manner and time since death – especially in accidental deaths, hanging, burns, drowning and poisoning.
3. Preserve and dispatch specimens and other relevant materials in medico legal/postmortem cases to the appropriate Government agencies for necessary examination and report.
4. Understand and observe medical ethics, etiquette, duties, rights, and medico-social and legal responsibilities of the physicians towards patients, profession, state and society at large.
5. Be aware of relevant legal/court procedures applicable to medico legal/medical practice.
6. Deal with basic aspects of diagnosis and management of poisoning (acute & chronic), and develop competence to deal with medico-social and medico legal issues arising there-from
7. Recognize and deal with the general principles of environmental, occupational, and preventive aspects of toxicology.
8. Manage medico legal and medico-social issues related to mass disasters, including chemical and bioterrorism

9. Recognize the importance of convincing patients/victims of the need for making a case medico legal in nature in the casualty whenever required, as well as the importance of convincing relatives of brain-dead victims of trauma to donate organs for transplantation.

Knowledge

- Identify medico legal cases
- Define responsibilities of a basic physician: both medico legal and medico-social.
- Appreciate physician's responsibilities in criminal matters
- Be aware of the principles of analytical toxicology
- Diagnose, manage & document acute/chronic poisonings

Skills

- Perform, make observations in post mortems/make logical inferences
- Prepare proper certificates related to death, age, wound, fitness and sickness
- Describe and testify as an expert witness in a Court of Law

Integration

- Provide integrated approach with other allied disciplines of medicine such as anatomy, pathology, radiology, hospital administration, emergency medicine, dentistry, microbiology, medicine, pharmacology, surgery, obstetrics & gynecology, pediatrics and psychiatry.
- Impart training relating to medico legal responsibilities of physicians at all levels of healthcare.

COMPETENCIES:

Period of Training – Phase II MBBS & Phase III part 1 MBBS

The learner must demonstrate:

- Understanding of medico-legal responsibilities of physicians in primary and secondary care settings,
- Understanding of the rational approach to the investigation of crime, based on scientific and legal principles,
- Ability to manage medical and legal issues in cases of poisoning /overdose,
- Understanding the medico-legal framework of medical practice and medical negligence,
- Understanding of codes of conduct and medical ethics.

Integration: The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine

Period of Training – Internship

A. An intern must perform or assisting:

- Identifying and documenting medico-legal problems in a hospital and general practice,
- Identifying the medico-legal responsibilities of a medical man in various hospital situations,
- Diagnosing and managing with competence basic poisoning conditions in the community,
- Diagnosing and managing with competence and documentation in cases of Rape /Sexual assault,
- Preparing medico-legal reports in various medico legal situations.

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

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

Certifiable Procedural skills desirable of Indian Medical Graduate in Forensic Medicine & Toxicology

- Documentation and certification of trauma(I)
- Diagnosis and certification of death (D)
- Legal documentation related to emergency cases(D)
- Certification of medico-legal cases e.g. Age estimation, Sexual Violence etc.(D)
- Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc (D)

I- Independently performed on patients,

O- Observed in patients or on simulations,

D- Demonstration on patients or simulations and performance under supervision in patients

Competencies in Internship			
Sl. no	Topic	Competencies	Procedures requiring certification
1	Documentation and certification of trauma (I)	1	1
2	Diagnosis and certification of death (D)	1	1
3	Legal documentation related to emergency cases (D)	1	1
4	Certification of medico-legal cases e.g. Age estimation, Sexual Violence etc. (D)	3	3
5	Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc (D)	3	3
	Total	9	9

Minimum Teaching Hours in MBBS Phase II & Phase III part1

Forensic Medicine & Toxicology	Lectures (hours)	Small group learning (Tutorials / Seminars) /Integrated learning (hours)	Self - Directed Learning (hours)	Total (hours)
Phase II	15	30	05	50
Phase III part 1	25	45	05	75
Total	40	75	10	125
AETCOM	Lectures (hours)	Small group learning (Tutorials / Seminars) /Integrated learning (hours)	Self - Directed Learning (hours)	Total (hours)
Phase II	04	02	02	08

Specific Learning Objectives

No.	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	S L O s	TLMs	Assessment Method
1. General information							
FM 1.1	Demonstrate knowledge of basics of Forensic Medicine like definitions of Forensic medicine, Clinical Forensic Medicine, Forensic Pathology, State Medicine, Legal Medicine and Medical Jurisprudence	K	KH	N	At the end of the session, a student shall be able to: 1.1.1 : Define Forensic Medicine and Medical Jurisprudence. 1.1.2 : Describe different branches of Forensic medicine like Clinical Forensic Medicine, Forensic Pathology, Forensic Odontology and Forensic Psychiatry. 1.1.3 : Discuss on Forensic Medicine practice in different partsof theworld.	Lecture, SGD	No assessment
FM 1.2	Describe history of Forensic Medicine	K	KH	N	At the end of the session, a student shall be able to: 1.2.1: Describe the etymology of Forensic Medicine. 122 : Describe how knowledge of medicine was applied to aid in the administration of justice from ancient time and its evolution to the recent times. 123 : Enumerate the important people and events related to Forensic Medicine.	Lecture, SGD	No assessment

FM 1.3	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	At the end of the session, a student shall be able to: 1.3.1 : Describe the meaning of Criminal Procedure Code, Indian Penal Code, and Indian Evidence Act. 1.3.2 : Differentiate between civil and criminal cases and their proceedings in the court of law. 1.3.3 : Define inquest. 1.3.4 : Describe the types of inquest practiced in India.	Lecture, SGD	No assessment
					1.3.5: Discuss the meaning of cognizable and non-cognizable offence with examples.		
FM 1.4	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	At the end of the session, a student shall be able to: 1.4.1 : List various civil and criminal courts in India. 1.4.2 : Describe the location, presiding officer and powers of various courts in India.	Lecture, SGD	Not for assessment

FM 1.5	Describe Court procedures including issue of summons, conduct money, types of witnesses, recording of evidence: oath, affirmation, examination in chief, cross examination, re-examination & court questions, recording of evidence & conduct of doctor in witnessbox.	K	KH	N	At the end of the session, a student shall be able to: 1.5.1: Define ‘Summons’. 1.5.2 : Describe the formalities to be followed by a doctor while receiving summons and consequence of not honoring the summons. 1.5.3 : Define ‘Witness’. 1.5.4 : Describe the types of witness. 1.5.5 : Define ‘Evidence’. 1.5.6 : Describe the types of evidence. 1.5.7 : Describe the steps of recording evidence in the court of law. 1.5.8 : Describe the conduct of a doctor in the witnessbox.	Lecture, SGD (Mock court)	Not for assessment
FM 1.6	Describe the offences in Court including Perjury; Court strictures vis-a-vis medical officer	K	KH	N	At the end of the session, a student shall be able to: 1.6.1: Explain the meaning of perjury and its punishment. 1.6.2: Mention the various offences that could be charged upon medical officer by the court of law and its punishment.	Lecture, SGD	Not for assessment
FM 1.7	Describe Dying Declaration and Dying Deposition.	K	KH	Y	At the end of the session, a student shall be able to: 1.7.1: Define dying declaration and dying deposition. 1.7.2: Describe the procedure of recording of dying declaration. 1.7.3: Differentiate between dying declaration and dying deposition.	Lecture, SGD	Written, Viva voce
FM 1.8	Describe the latest decisions/notifications/resolutions/circulars / standing orders related to medico-legal practice issued by	K	KH	Y	At the end of the session, a student shall be able to: 1.8.1: Describe the latest decisions/notifications/resolutions/ circulars/ standing orders related to medico-legal practice issued by Courts.	Lecture, SGD	Written, Viva voce

	Courts/Government authorities etc.				1.8.2 : Describe the latest decisions/notifications/resolutions/ circulars/ standing orders related to medico-legal practice issued by Central Government authorities. 1.8.3 : Describe the latest decisions/notifications/resolutions/ circulars/ standing orders related to medico-legal practice issued by State Government authorities. 1.8.4 : Describe the latest decisions/notifications/resolutions/ circulars / standing orders related to medico-legal practice issued by NMC/MCI/SMC.	Lecture, SGD	Written, Viva voce
FM 1.9	Describe the importance of documentation in medical practice in regard to				At the end of the session, a student shall be able to: 1.9.1 : Enumerate various medical / medicolegal records to be maintained by hospital/	Lecture, SGD	Written, Viva voce

	medicolegal examinations, Medical certificates & 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	K	K H	Y	medical practitioner. 1.92 : Describe the importance of documentation and maintenance of medical records (out-patient slips, in-patient case details, consent forms, operative & anesthetic notes, discharge/death summary, sickness & fitness certificates, MCCD certificate, etc). 1.93 : Describe the importance of documentation and maintenance of medicolegal records (MLC register, MTP register, age certificate, wound certificate, drunkenness certificate, sexual violence report, postmortem report, etc).		

	- Documents of issuance of drunkenness certificate - Documents of issuance of sickness & fitness certificate - Documents of issuance of death certificate - Documents of issuance of medical certification of cause of death-form no.4, 4A - Documents of estimation of age by physical, dental & radiological examination & issuance of certificate						
FM 1.10	Select appropriate cause of death in a particular scenario by referring ICD 10 code.	K	KH	Y	At the end of the session, a student shall be able to: 1.10.1: Explain the importance of ICD-10 code in certifying the cause of death. 1.10.2: Enumerate the important causes of death as per ICD-10. 1.10.3: Choose the appropriate cause of death in a particular scenario.	Lecture, SGD	Written, Viva voce

FM 1.11	Write a correct cause of death certificate as per ICD 10 document	S	SH	Y	At the end of the session, a student shall be able to: 1.11.1: Describe the objectives of MCCD certification. 1.11.2: Draft the MCCD certificate in a particular scenario as per ICD-10. 1.11.3: Explain the procedure of dispatching MCCD certificate to the concerned authorities.	SGD (Practical)	OSPE
2. Forensic Pathology							
FM 2.1	Define, describe and discuss death and its types including somatic / clinical / cellular, molecular and brain-death, Cortical Death and Brainstem Death	K	KH	Y	At the end of class, a student shall be able to: 2.1.1 : Definedeath. 2.1.2 : Describe the types of death (somatic, molecular,brain- death, cortical death and brainstemdeath). 2.1.3 : Describe the procedure of declaring death withspecific reference to brain stemdeath.	Lecture, SGD	Written, Viva voce
FM 2.2	Describe and discuss natural and unnatural deaths	K	KH	Y	At the end of class, a student shall be able to: 2.2.1: Describe the manner of death and cause of death.	Lecture, SGD	Written, Viva voce
FM 2.3	Describe and discuss issues related to sudden natural deaths	K	KH	Y	At the end of class, a student shall be able to: 2.3.1 : Define sudden naturaldeath. 2.3.2 : Enumerate the causes for sudden naturaldeath. 2.3.3 : Describe the medicolegal importance of sudden naturaldeath. 2.3.4 : Discuss the autopsy procedure in case of suddennatural death.	Lecture, SGD	Written, Viva voce

FM 2.4	Describe salient features of the Organ Transplantation and The Human Organ Transplant (Amendment) Act 2011 and discuss ethical issues regarding organ donation.	K	KH	Y	At the end of class, a student shall be able to: 2.4.1 : Discuss the ethical and legal issues related to organ donation and transplantation. 2.4.2 : Describe the salient features of The Human Organ Transplant Act, 1994 with amendments till date.	Lecture, SGD	Written, Viva voce
FM 2.5	Discuss moment of death, modes of death - coma, asphyxia and syncope.	K	KH	Y	At the end of class, a student shall be able to: 2.5.1: Describe the modes of death (coma, syncope, asphyxia).	Lecture, SGD	Written, Viva voce
FM 2.6	Discuss presumption of death and survivorship.	K	KH	Y	At the end of class, a student shall be able to: 2.6.1: Discuss the importance of presumption of death (Sec. 107 & 108 IEA).	Lecture, SGD	Written, Viva voce
FM 2.7	Describe and discuss suspended animation.	K	KH	Y	At the end of class, a student shall be able to: Define suspended animation. 2.7.1 : Enumerate the causes for suspended animation. 2.7.2 : Discuss the medicolegal importance of suspended animation.	Lecture, SGD	Written, Viva voce

FM 2.8	Describe and discuss post-mortem changes including signs of death, cooling of body, post-mortem lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening	K	KH	Y	At the end of class, a student shall be able to: 2.8.1 : Classify post-mortem changes (immediate, early,late). 2.8.2 : Describe postmortem cooling and itsmedicolegal importance. 2.8.3: Define postmortemlividity. 2.8.4: Describe postmortem lividity and its medico legalimportance. 2.8.5: Define rigormortis. 2.8.6: Describe rigor mortis and its medico legal importance. 2.8.7: Enumerate the conditions simulating rigor mortis. 2.8.8 : Define cadavericspasm. 2.8.9 : Differentiate between cadaveric spasm and rigormortis. 2.8.10 : Discuss on cold stiffening, heat stiffening,chemical stiffening and gasstiffening.	Lecture, SGD	Written, Viva voce
FM 2.9	Describe putrefaction, mummification, adipocere and maceration	K	KH	Y	At the end of class, a student shall be able to: 2.9.1 : Describe the various changes seen in the body due to putrefaction. 2.9.2 : Defineadipocere. 2.9.3 : Describe adipocere and its medico legal importance. 2.9.4: Definemummification. 2.9.5: Describe mummification and its medico legal importance.	Lecture, SGD	Written, Viva voce
FM 2.10	Discuss estimation of time since death	K	KH	Y	At the end of class, a student shall be able to: 2.10.1 : Enumerate the various factors which help in determinationof time since death. 2.10.2 : Discuss on Forensicentomology.	Lecture, SGD	Written, Viva voce

FM 2.11	Describe and discuss autopsy procedures including post- mortem examination, different types of autopsies, aims and objectives of post-mortem examination	K	KH	Y	At the end of class, a student shall be able to: 2.11.1: Describe the types of autopsy. 2.11.2: Enumerate the objectives of medicolegal autopsy. 2.11.3: Enumerate the objectives of foetal autopsy. 2.11.4: Enumerate the objectives of skeletal remains examination.	Lecture, SGD	Written, Viva voce
FM 2.12	Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post- mortem examination.	K	KH	Y	At the end of class, a student shall be able to: 2.12.1: Describe the rules for conducting medicolegal autopsy. 2.12.2: Enumerate the skin incisions in medicolegal autopsy. 2.12.3: Enumerate the methods of evisceration in medicolegal autopsy. 2.12.4 : Describe the external and internal examination in medicolegal autopsy. 2.12.5 : Explain the special techniques used in medicolegal autopsy (demonstration of pneumothorax, air embolism, etc).	Lecture, SGD	Written, Viva voce
FM 2.13	Describe and discuss obscure autopsy.	K	KH	Y	At the end of class, a student shall be able to: 2.13.1: Discuss on obscure autopsy with examples. 2.13.2: Discuss on negative autopsy with examples.	Lecture, SGD	Written, Viva voce

FM 2.14	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	At the end of class, a student shall be able to: 2.14.1: Describe the method of preservation and dispatch of viscera and body fluids for chemical analysis. 2.14.2: Describe the method of preservation and dispatch of viscera and body fluids for histopathology and microbiological investigations. 2.14.3: Describe the method of preservation and dispatch of clothes in a medicolegal case. 2.14.4: Discuss on postmortem artefacts and their medicolegal importance.	Lecture, SGD	Written, Viva voce
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	At the end of class, a student shall be able to: 2.15.1: Describe the National Human Rights Commission guidelines for conduction of medicolegal autopsy in cases of death in custody or violation of human rights.	Lecture, SGD	Written, Viva voce
FM 2.16	Describe and discuss examination of mutilated bodies or fragments, charred bones and bundle of bones.	K	KH	Y	At the end of class, a student shall be able to: 2.16.1: Describe the procedure of examination of mutilated bodies /fragments. 2.16.2: Describe the procedure of examination of skeletal remains (including charred bones).	Lecture, SGD	Written, Viva voce
FM 2.17	Describe and discuss exhumation.	K	KH	Y	At the end of class, a student shall be able to: 2.17.1: Define exhumation. 2.17.2: Enumerate the objectives of exhumation. 2.17.3: Describe the rules and procedure of exhumation.	Lecture, SGD	Written, Viva voce

FM 2.18	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	At the end of class, a student shall be able to: 2.18.1 : Enumerate the objectives of crime scene visit by an autopsy surgeon. 2.18.2 : Describe the procedure of examination of crime scene and preservation of evidentiary material. 2.18.3 : Explain the reconstruction of a case after the crime scene visit.	Lecture, SGD	Written, Viva voce
FM 2.19	Investigation of anaesthetic, operative deaths: describe and discuss special protocols for conduction of autopsy and for collection, preservation and dispatch of related material evidences.	K	KH	Y	At the end of class, a student shall be able to: 2.19.1: Explain the significance of autopsy in operative deaths. 2.19.2: Describe the procedure of autopsy in operative deaths. 2.19.3: Describe the procedure of preservation and dispatch of evidentiary material for investigation in deaths associated with anaesthesia and surgery.	Lecture, SGD	Written, Viva voce
FM 2.20	Mechanical asphyxia: Define, classify and describe asphyxia and medico-legal interpretation of post-mortem findings in asphyxial deaths.	K	KH	Y	At the end of class, a student shall be able to: 2.20.1 : Define asphyxia. 2.20.2: Mention the various types of asphyxial deaths (mechanical, pathological, toxic, environmental, traumatic, postural, iatrogenic). 2.20.3: Describe the pathophysiology (vicious cycle) of asphyxia. 2.20.4: Explain the types of anoxia/hypoxia (Gordon's classification). 2.20.5: Discuss the classical postmortem findings in asphyxial deaths.	Lecture, SGD	Written, Viva voce
FM 2.21	Mechanical asphyxia: Describe and discuss different types of	K	KH	Y	At the end of class, a student shall be able to: 2.21.1: Define mechanical asphyxia death.	Lecture, SGD	Written, Viva voce

	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.			2.21.2: Classify mechanical asphyxial deaths. 2.21.3: Define hanging. 2.21.4: Enumerate the types of hanging. 2.21.5: Explain the symptoms experienced by the victim in hanging. 2.21.6: Describe the causes of death, postmortem findings and medicolegal aspects of death due to hanging. 2.21.7: Discuss on judicial hanging. 2.21.8: Define strangulation. 2.21.9: Enumerate the types of strangulation. 2.21.10: Describe the causes of death, postmortem findings and medicolegal aspects of death due to ligature strangulation. 2.21.11: Describe the causes of death, postmortem findings and medicolegal aspects of death due to manual strangulation. 2.21.13: Discuss on Bandsola, Mugging, Garroting, 2.21.14: Describe the examination, preservation and dispatch of ligature material used in hanging and strangulation. 2.21.15: Explain the fractures of hyoid bone.		

FM 2.22	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	At the end of class, a student shall be able to: 2.22.1: Define traumatic asphyxia. 2.22.2: Describe the pathophysiology, postmortem findings and medicolegal aspects of traumatic asphyxia. 2.22.3: Discuss on postural/positional asphyxia. 2.22.4: Discuss on Overlying. 2.22.5: Define suffocation. 2.22.6: Enumerate the types of suffocation. 2.22.7: Describe the postmortem findings and medicolegal aspects of Environmental asphyxia, Smothering, Gagging and Choking. 2.22.8: Discuss on Café-coronary. 2.22.9: Discuss on Burking. 2.22.10: Describe methods used, postmortem findings and medicolegal aspects of Sexual/ Auto-erotic asphyxia.	Lecture, SGD	Written, Viva voce
FM 2.23	Mechanical asphyxia: Describe and discuss types, patho- physiology, clinical features, post-mortem findings and medico-	K	KH	Y	At the end of class, a student shall be able to: 2.23.1: Define drowning. 2.23.2: Explain the mechanism of drowning. 2.23.3: Enumerate the types of drowning.	Lecture, SGD	Written, Viva voce
	legal aspects of drowning, diatom test and gettler test.				2.23.4: Describe the pathophysiology, causes of death, postmortem findings and medicolegal aspects of drowning. 2.23.5: Describe the clinical features and treatment of Post- immersion syndrome (Near drowning). 2.23.6: Discuss on Diatom test and its medicolegal importance. 2.23.7: Discuss on Gettler test and its dicolegal importance.		

FM 2.24	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	At the end of class, a student shall be able to: 2.24.1: Classify thermal injuries. 2.24.2: Describe the local (frostbite, trench foot, immersion foot) and general effects (hypothermia) due to Cold. 2.24.3: Describe the postmortem findings and medicolegal aspects of deaths due to Hypothermia. 2.24.4: Describe the general effects due to Heat (heat cramps, heat exhaustion/prostration, heat hyperpyrexia/heat stroke/sunstroke). 2.24.5: Describe the postmortem findings and medicolegal aspects of deaths due to Heatstroke.	Lecture, SGD	Written, Viva voce
FM 2.25	Describe types of injuries, clinical features, pathophysiology, postmortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations.	K	KH	Y	At the end of class, a student shall be able to: 2.25.1: Define Burn. 2.25.2: Enumerate the types or causes of burns. 2.25.3: Describe the degree of burns (Dupuytren's, Wilson's and Clinical classification). 2.25.4: Explain the method of calculation of percentage of burns (Rule of Nine/Wallace, Lund and Browder chart). 2.25.5: Describe the clinical features, management, causes of death, postmortem findings and medicolegal aspects of Dry burns and Scalds. 2.25.6: Differentiate between antemortem and postmortem burns. 2.25.7: Describe the factors affecting the electrical injuries. 2.25.8: Describe the postmortem findings, causes of death and medicolegal aspects in deaths due to electrocution.	Lecture, SGD	Written, Viva voce

					2.25.9: Describe the factors affecting the lightning injuries. 2.25.10: Describe the postmortem findings, causes of death and medicolegal aspects in deaths due to lightning.		
					2.25.11: Discuss on injuries caused by exposure to radiation.		
FM 2.26.	Describe and discuss clinical features, post-mortem findings and medico-legal aspects of death due to starvation and neglect	K	KH	Y	At the end of class, a student shall be able to: 2.26.1: Explain the meaning of starvation. 2.26.2: Enumerate the types of starvation. 2.26.3: Enumerate the causes of starvation. 2.26.4: Describe the factors modifying the effects of starvation. 2.26.5: Describe the clinical features, management, causes of death, postmortem findings and medicolegal aspects of starvation.	Lecture, SGD	Written, Viva voce
FM 2.27	Define and discuss infanticide, foeticide and stillbirth	K	KH	Y	At the end of class, a student shall be able to: 2.27.1: Define Foeticide, Neonaticide and infanticide. 2.27.2: Define dead birth, still birth and live birth. 2.27.3: Discuss on medicolegal aspects of infanticide.	Lecture, SGD	Written, Viva voce
FM 2.28	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 Infant Death syndrome. Munchausen's syndrome by proxy. <i>[Munchausen's syndrome by proxy is covered in FM3.29]</i>	K	KH	Y	At the end of class, a student shall be able to: 2.28.1: Describe the causes of Intra Uterine Death(IUD). 2.28.2: Describe the features of 'Dead born foetus'. 2.28.3: Define 'Viability of foetus' and its medicolegal importance. 2.28.4: Describe the method of estimation of gestational age of foetus. 2.28.5: Describe the signs of 'Live birth'. 2.28.6: Describe the causes of infant death. 2.28.7: Define Sudden Infant Death Syndrome(SIDS). 2.28.8: Describe causes, postmortem findings & medicolegal aspects of SIDS.	Lecture, SGD	Written, Viva voce

FM 2.29	Demonstrate respect to the directions of courts, while appearing as witness for recording of evidence under oath or affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence	A C	SH	Y	At the end of class, a student shall be able to: 2.29.1: Demonstrate the procedure of receiving summons. 2.29.2: Demonstrate the oath taking in the court of law. 2.29.3 : Demonstrate the procedure of recording of evidence in court of law (examination in chief, cross examination, re-examination, question by Judge). 2.29.4 : Demonstrate the doctor's professionalism (attitude and subject expertise) expected in the witness box.	Role play/ Mock court/ Video	OSPE
FM 2.30 (Along with	Have knowledge / awareness of latest decisions / notifications / resolutions / circulars / standing orders related to medico-legal	A	K	Y	At the end of class, a student shall be able to: 2.30.1: Debate on the latest decisions / notifications / circulars / standing orders related to medico-legal practice issued by Courts. 2.30.2: Debate on the latest decisions/notifications/circulars/standing orders related to medico- legal practice issued by Central Government.	SGD (debate on relevant topics related to Medico-legal practice)	Viva voce
FM 1.8)	practice issued by Courts/ Government authorities etc.				2.30.3: Debate on the latest decisions/notifications/circulars/standing orders related to medico- legal practice issued by State Government. 2.30.4: Debate on the latest decisions/notifications/circulars/standing orders related to medico-legal practice issued by NMC/MCI/SMC.		

FM 2.31	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	At the end of class, a student shall be able to: 2.31.1 : Demonstrate the benefit of team work in a medicolegal autopsy of alleged medical negligence. 2.31.2 : Demonstrate the benefit of team work in a medicolegal autopsy of alleged dowry death. 2.31.3 : Demonstrate the benefit of team work in a medicolegal autopsy of alleged custodial death. 2.31.4 : Demonstrate the benefit of team work in a medicolegal autopsy of death due to violation of human rights. 2.31.5 : Demonstrate the benefit of team work in exhumation.	Role play/ Critical analysis of cases	Viva voce
FM 2.32	Demonstrate ability to exchange information by verbal or nonverbal communication to the peers, family members, law enforcing agency and judiciary	A C	KH	Y	At the end of class, a student shall be able to: 2.32.1 : Demonstrate the skills of communication by a doctor with the peers. 2.32.2 : Demonstrate the skills of communication by a doctor with the patient's family members in MLC works at casualty. 2.32.3 : Demonstrate the skills of communication by a doctor with the deceased family members during medicolegal autopsy. 2.32.4 : Demonstrate the skills of communication by a doctor with the law enforcing agency/ judiciary in medicolegal practices.	Role play / Video	OSPE

FM 2.33	Demonstrate ability to use local resources whenever required like in mass disaster situations	A C	KH	Y	At the end of class, a student shall be able to: 2.33.1 : Define Massdisaster 2.33.2 : Enumerate the types of Massdisaster. 2.33.3 : List the objectives of forensic investigation in massdisasters. 2.33.4: Describe the procedure of examination at disaster site and autopsy. 2.33.5 : Describe the evidentiary materials to be preserved inmass disasters. 2.33.6 : Demonstrate the importance of team work in Mass Disasters.	Lecture, SGD Role play / Video	Written, Viva voce
FM 2.34	Demonstrate ability to use local resources whenever required like in mass disaster situations	A C	KH	Y	At the end of class, a student shall be able to: 2.34.1 : Define Massdisaster 2.34.2 : Enumerate the types of Massdisaster. 2.34.3 : List the objectives of forensic investigation inmass disasters. 2.34.4: Describe the procedure of examination at disaster siteand autopsy.	Lecture, SGD Role play / Video	Written, Viva voce
					2.34.5 : Describe the evidentiary materials to be preserved inmass disasters. 2.34.6: Demonstrate the importance of team work in MassDisasters.		

3. Clinical Forensic Medicine							
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, medicolegal aspects of age	K	KH	Y	At the end of the session, a student shall be able to: 3.1.1 : Define Corpusdelicti 3.1.2 : Describe the importance of corpus delicti in establishing thecrime. 3.1.3: List the various means of identification in living anddead persons. 3.1.4: Explain the role of hand writing analysis, gait, speech, photography and facial description as a tool ofidentification. 3.1.5 : Describe the methods of determination ofrace. 3.1.6 : Describe the methods of sex determination in a livingperson. 3.1.7: Describe the methods of sex determination in a deadperson. 3.1.8: Defineintersex. 3.1.9: Describe the types of intersex and its medicolegalimportance. 3.1.10: Describe the methods of age determination in a living person. 3.1.11 : Describe the methods of age determination in a dead person. 3.1.12: Explain the method of age estimation using Gustafson's technique. 3.1.13: Discuss the forensic aspects related to teeth. 3.1.14: Describe the methods of determination ofstature.	Lecture, SGD	Written Viva voce

FM 3.2	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	At the end of the session, a student shall be able to: 3.2.1: Explain the role of hair in the identification of an individual. 3.2.2: Describe the medicolegal importance of hair. 3.2.3 : Describe the dyes used, methods of erasure and medicolegal importance of atattoo. 3.2.4 : Describe the medicolegalimportance of the scar. 3.2.5: Defineanthropometry. 3.2.6 : Describe various data included in anthropometry and its importance inidentification. 3.2.7 : Definedactylography. 3.2.8 : Describe the types, method of collection andmedicolegal importance ofdactylography. 3.2.9 : Discuss the role of poroscopy, cheiloscopyand rugoscopy inidentification. 3.2.10 : Describe the role of foot prints in establishing theidentity. 3.2.11 : Describe the role of facial reconstruction in establishing theidentity. 3.2.12 : Discuss the role of superimposition in establishingthe identity.	Lecture, SGD	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	At the end of the session, a student shall be able to: 3.3.4 : Define mechanical injury. 3.3.5 : Classify mechanical injuries. 3.3.3: Define abrasion. 3.3.6 : Describe the characteristic features, types and medicolegal aspects of an abrasion 3.3.7 : Define contusion. 3.3.8 : Describe the characteristic features, types and medicolegal aspects of contusion. 3.3.9 : Describe the factors influencing the formation of contusion. 3.3.10 : Define laceration. 3.3.11 : Describe the characteristic features, types and medicolegal aspects of a laceration. 3.3.12 : Define an incised wound. 3.3.13 : Describe the characteristic features, types and medicolegal aspects of an incised wound. 3.3.14 : Define chop wound. 3.3.15 : Describe the characteristic features and medicolegal aspects of chop wound. 3.3.16 : Define stab wound. 3.3.17 : Describe the characteristic features, types and medicolegal aspects of stab wound. 3.3.18 : Define defense wound. 3.3.19 : Describe the characteristic features and medicolegal importance of defense wound. 3.3.20 : Define fabricated wound. 3.3.21 : Describe the characteristic features and medicolegal 3.3.22 importance of fabricated wound.	Lecture, SGD	Written Viva voce

FM 3.4	Mechanical injuries and wounds: Define injury, assault & hurt. Describe IPC pertaining to injuries	K	KH	Y	At the end of the session, a student shall be able to: 3.4.1 : Define injury (S. 44 IPC), assault (S. 351 IPC) and hurt (S. 319 IPC). 3.4.2 : Define homicide. 3.4.3 : Describe the types of homicide. 3.4.4: Describe Grievous hurt (S. 320 IPC). 3.4.5: Understand the IPC sections pertaining to injuries (Sec. 44, 299, 300, 302, 304, 304-A, 304-B, 306, 307, 319, 320, 321-326, 351, 354, 497, 498-A).	Lecture, SGD	Written, Viva voce
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	At the end of the session, a student shall be able to: 3.5.1 : Define medico-legal case (MLC) with examples. 3.5.2 : Differentiate between the accidental, suicidal and homicidal injuries with examples. 3.5.3 : Describe simple and grievous hurt. 3.5.4 : Explain the difference between the injuries that are likely to cause death, sufficient in the ordinary course of nature to cause death and imminently dangerous. 3.5.5 : Describe the difference between ante-mortem and post- mortem wounds.	Lecture, SGD	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	At the end of the session a student shall be able to: 36.1 : Describe wound healing by primary and secondary intention and its medicolegal importance. 36.2 : Enumerate the types of fracture. 36.3 : Describe the healing of a fracture and its medicolegal importance. 36.4 : Describe the difference between ante-mortem and post-mortem fracture.	Lecture, SGD	Written, Viva voce
FM3.7 <i>(Along with FM 14.1)</i>	Mechanical injuries and wounds: 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	At the end of the session, a student shall be able to: 3.7.1 : Describe the factors influencing the causation of an injury. 3.7.2 : Describe the factors that influence healing of an injury or fracture. 3.7.3 : Discuss the primary and secondary causes of death from a wound.	Lecture, SGD	Written, Viva voce
FM 3.8 <i>(Along with FM 14.1 1)</i>	Mechanical injuries and wounds: Describe and discuss different types of weapons including dangerous weapons and their examination	K	K/KH	Y	At the end of the session, a student shall be able to: 3.8.1 : Identify the weapons that cause blunt force and sharp force injuries. 3.8.2 : Define dangerous weapon (S. 324 IPC and 326 IPC).	Lecture, SGD	Written, Viva voce

FM3.9	Firearm injuries: Describe different types of firearms including structure and components. Along with description of ammunition propellant charge and	K	K/KH	Y	At the end of the session, a student shall be able to: 39.1 : Define Forensic ballistics, Proximal ballistics, Intermediate ballistics, and Terminal ballistics. 39.2 : Define firearm. 39.3 : Classify firearms. 39.4 : Enumerate the parts of the basic firearms.	Lecture, SGD	Written, Viva voce
	mechanism of fire-arms, different types of cartridges and bullets and various terminology in relation of firearm – caliber, range, choking				3.9.5 : Explain ‘rifling’ and ‘calibre’ of a firearm. 3.9.6 : Explain ‘choking’ in a firearm and its purpose. 3.9.7 : Enumerate the components of rifled firearm and shotgun cartridge, and its function. 3.9.8 : Describe the types of gunpowder. 3.9.9 : Discuss on types of bullets and pellets.		

FM 3.10	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	At the end of the session, a student shall be able to: 3.10.1: Define wound ballistics. 3.10.2: Enumerate the factors affecting gunshot wound production. 3.10.3: Explain the mechanism of firing and various components of discharge of firing. 3.10.4: Describe the entry and exit wounds from a rifled firearm at various ranges. 3.10.5: Describe the entry and exit wounds from a shotgun at various ranges. 3.10.6: Discuss on Ricocheting of a bullet and its effect. 3.10.7: Discuss on Tumbling bullet, Yawning bullet, Dum dum bullet, Tandem bullet, Souvenir bullet. 3.10.8: List the evidentiary materials to be collected in gunshot wounds. 3.10.9: Describe the method of collection and preservation of evidentiary materials in gunshot wounds. 3.10.10 : Describe the significance of bullet markings and use of comparison microscope. 3.10.11: Enumerate the tests done for detection of gunshot residue. 3.10.12: Describe the injuries caused by bomb blast /explosion.	Lecture, SGD	Written, Viva voce

FM 3.11	Regional injuries: Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest,	K	K/KH	Y	At the end of the session, a student shall be able to: 3.11.1: Define head injury. 3.11.2: Discuss the forensic anatomy of scalp and scalp injuries. 3.11.3: Enumerate the types of skull fracture. 3.11.4: Describe the intracranial hemorrhages and its medicolegal aspects. 3.11.5: Describe the cerebral injuries and its medicolegal aspects.	Lecture, SGD	Written, Viva voce
	abdomen, limbs, genital organs, spinal cord and skeleton				3.11.6: Explain 'concussion of brain' and 'diffuse axonal injury'. 3.11.7: Discuss on 'Punch drunk syndrome'. 3.11.8: Describe the mechanism, clinical features and medicolegal aspects of whiplash injury. 3.11.9: Discuss on 'railway spine'. 3.11.10: Discuss on injuries to chest, abdomen and genital organs.		
FM 3.12	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	At the end of the session, a student shall be able to: 3.12.1: Describe the injuries sustained to person in a fall from height. 3.12.2: Describe the injuries to a pedestrian in vehicular accident (primary impact, second impact and secondary injuries). 3.12.3: Describe the injuries to driver, front seat passenger and back seat passenger of a motorcar. 3.12.4: Discuss on 'Crush syndrome'.	Lecture, SGD	Written, Viva voce

FM 3.13	Sexual offences: 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	At the end of the session, a student shall be able to: 3.13.1: Classify sexualoffences. 3.13.2: Define ‘rape’ as persection 375 IPC. 3.13.3: Define ‘statutory rape’. 3.13.4: Discuss on ‘date rape’. 3.13.5: Describe the punishment for rape (Sec. 376IPC). 3.13.6: Explain the meaning of ‘custodial rape’and punishment forit. 3.13.7: Explain the meaning of ‘gang rape’ and punishment forit. 3.13.8: Understand the salient features of section 354, 354-A, 354-B, 354-C and 354-DIPC. 3.13.9: Describe the salient features of Protection ofChildren from Sexual Offences Act (POCSO),2012.	Lecture, SGD	Written, Viva voce
FM 3.14	Sexual offences: Describe and discuss the examination of the victim of an alleged case of rape, and the	K	K/KH	Y	At the end of the session, a student shall be able to: 3.14.1: Describe the findings in a victim of sexual violence. 3.14.2: Describe the duties of doctor towards victim of sexual violence.	Lecture, SGD	Written, Viva voce

	preparation of report, framing the opinion and preservation and dispatch of trace evidences in such cases.				3.14.3: Understand the legal sections related to examination of a victim of sexual violence (164-A CrPC, 327 CrPC, 357-C CrPC, 228-A IPC, 114-A IEA, 146IEA). 3.14.4: Describe the procedure of examination, contents of the format, guidelines for preliminary and final opinion in a victim of sexual violence (given by Ministry of Health and Family welfare, Government of India). 3.14.5: Describe the procedure of collecting, preservation and dispatch of evidentiary materials from a victim of sexual violence. 3.14.6: Understand the significance of SAFE kit in collecting evidentiary material from a victim of sexual assault.		

FM 3.15	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	At the end of the session, a student shall be able to: 3.15.1 : Definesodomy. 3.15.2 : Describe the findings in a victim ofsodomy. 3.15.3 : Describe the procedure of examination, contents ofthe format, and guidelines for opinion in a victim ofsodomy. 3.15.4 : Describe the procedure of collecting, preservationand dispatch of evidentiary materials from a victim ofsodomy. 3.15.5 : Describe the findings in an accused of sexualassault. 3.15.6 : Describe the procedure of examination, contents of the format, and guidelines for opinion in an accused of sexual assault. 3.15.7 : Understand the recent amendments in section 377IPC.	Lecture, SGD	Written, Viva voce
FM 3.16	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 dispatch of trace evidences in such cases.	K	K/KH	Y	At the end of the session, a student shall be able to: 3.16.1 : Explain the meaning of ‘adultery’ and its medicolegal importance. 3.16.2 : Explain the meaning of ‘incest’ and itsmedicolegal importance. 3.16.3 : Define unnatural sexual offence (Sec. 377IPC). 3.16.4 : Discuss on ‘lesbianism’ and its medicolegalimportance. 3.16.5: Discuss on ‘buccal coitus’ and its medicolegal importance. 3.16.6 : Discuss on ‘bestiality’ and its medicolegal importance. 3.16.7 : Describe the procedure of examination, collection, preservation and dispatch of evidentiary materials in a victim and accused of lesbianism, buccal coitus and bestiality.	Lecture, SGD	Written, Viva voce

FM 3.17	Sexual offences: Describe and discuss the sexual perversions fetishism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia.	K	K/KH	Y	At the end of the session, a student shall be able to: 3.17.1: Define sexualparaphilia. 3.17.2: Explain the sexual perversions requiring partner for sexual gratification (sadism, masochism,frotteurism, pedophilia, necrophilia,necrophagia). 3.17.3: Explain the sexual perversions not requiring partner for sexual gratification (voyeurism,exhibitionism). 3.17.4: Explain the sexual perversions requiring object/article asa stimulus for sexual gratification (fetishism,transvestism).	Lecture, SGD	Written, Viva voce
FM 3.18	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	At the end of the session, a student shall be able to: 3.18.1: Describe anatomy of male and female genitalia. 3.18.2: Describe the anatomical appearance and types of hymen. 3.18.3 : Define virginity anddefloration. 3.18.4 : Describe the signs of virginity and itsmedicolegal importance. 3.18.5 : Definelegitimacy. 3.18.6 : Discuss the medicolegal importance oflegitimacy.	Lecture, SGD	Written, Viva voce

FM 3.19	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	At the end of the session, a student shall be able to: 3.19.1 : Describe the presumptive, probable and positive signs of pregnancy. 3.19.2 : Describe pseudocyesis. 3.19.3 : Define superfoetation and superfecundation. 3.19.4: Describe the medicolegal aspects of pregnancy. 3.19.5: Define delivery. 3.19.6 : Describe the signs of recent and remote delivery in a living individual. 3.19.7 : Enumerate the signs of recent & remote delivery in a dead individual. 3.19.8. Mention the medicolegal aspects of delivery. 3.19.9: Define precipitate labour. 3.19.10: Describe the signs and medicolegal aspects of precipitate labour.	Lecture, SGD	Written, Viva voce
FM 3.20	Discuss disputed paternity and maternity	K	K/KH	Y	At the end of the session, a student shall be able to: 3.20.1 : Discuss the medicolegal issues related to disputed paternity and maternity. 3.20.2 : Describe the method of identifying paternalism and maternalism.	Lecture, SGD	Written, Viva voce

FM 3.21	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	At the end of the session, a student shall be able to: 3.21.1: Describe the objectives of PCPNDT Act, 1994. 3.21.2: Enumerate the indications for prenatal diagnostic procedures. 3.21.3: List the various prenatal diagnostic techniques. 3.21.4: Describe the guidelines for establishing and maintaining the centres to practice prenatal diagnostic procedures. 3.21.5: Describe the punishment for offences under PCPNDT Act. 3.21.6: Discuss on amendments to the PCPNDT Act till date. 3.21.7: Define domestic violence. 3.21.8: Describe the salient features of The Protection of Women from Domestic Violence Act, 2005. 3.21.9: Explain the medicolegal responsibilities of a medical practitioner in a domestic violence case.	Lecture, SGD	Written, Viva voce
FM 3.22	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	At the end of the session, a student shall be able to: 3.22.1: Define impotence, sterility, frigidity, sexual/erectile dysfunction and premature ejaculation. 3.22.2: List the causes of impotence in male and female. 3.22.3: Describe the medicolegal issues related to impotence, sexual/erectile dysfunction and premature ejaculation. 3.22.4: List the causes of sterility in male and female. 3.22.5: Describe the medicolegal issues related to sterility. 3.22.6: Describe procedure of examination in alleged case of impotency.	Lecture, SGD	Written, Viva voce

FM 3.23	Discuss sterilization of male and female, artificial insemination, Test tube baby, surrogate mother, hormonal replacement therapy with respect to	K	K/KH	Y	At the end of the session, a student shall be able to: 3.23.1: Describe the methods of sterilization in male and female. 3.23.2: Discuss the medicolegal issues related to sterilization procedure. 3.23.3: Define artificial insemination.	Lecture, SGD	Written, Viva voce
	appropriate national and state laws.				3.23.4: Mention the types of artificial insemination. 3.23.5: Enumerate the indications for artificial insemination. 3.23.6: Discuss ethical issues and precautions to be taken during the artificial insemination. 3.23.7: Describe medicolegal issues related to artificial insemination. 3.23.8: Discuss on in vitro fertilization/ test tube baby and surrogate motherhood.		
FM 3.24	Discuss the relative importance of surgical methods of contraception (vasectomy and tubectomy) as methods of contraception in the National Family Planning Programme	K	K/KH	N	At the end of the session, a student shall be able to: 3.24.1: Describe the salient features of the National Family Planning Programme related to vasectomy and tubectomy.	SDL	Written, Viva voce
FM 3.25	Discuss the major results of National Family Health Survey	K	K/KH	N	At the end of the session, a student shall be able to: 3.25.1: Discuss the major results of National Family Health Survey (NFHS). (This competency will be taught and assessed by Dept of Community Medicine)	SDL	Written, Viva voce

FM 3.26	Discuss the National Guidelines of accreditation, supervision & regulation of ART Clinics in India	K	K/KH	Y	At the end of the session, a student shall be able to: 3.26.1: Discuss the National Guidelines for accreditation, supervision & regulation of ART Clinics in India. 3.26.2: Explain the recent updates on laws related to ART and Surrogacy.	Lecture, SGD	Written, Viva voce
FM 3.27	Define, classify and discuss abortion, methods of procuring MTP and criminal abortion, MTP Act 1971	K	K/KH	Y	At the end of the session, a student shall be able to: 3.27.1: Define abortion. 3.27.2: Classify abortion. 3.27.3: Describe the methods used for therapeutic abortion. 3.27.4: Describe the methods used for criminal abortion & its complications. 3.27.5: Discuss the Medical termination of Pregnancy Act, 1971 and its amendments.	Lecture, SGD	Written, Viva voce
FM 3.28	Describe evidence of abortion – living and dead, duties of doctor in cases of abortion,	K	K/KH	Y	At the end of the session, a student shall be able to: 3.28.1: Describe evidences of abortion in living and dead individual. 3.28.2: Explain the circumstances under which a case of abortion is brought to the notice of medical officer.	Lecture, SGD	Written, Viva voce
	investigations of death due to criminal abortion				3.28.3: Describe the medical and legal duties of doctor in a case of criminal abortion. 3.28.4: Describe the examination, method of collection, preservation and dispatch of evidentiary materials during investigation of death of woman in criminal abortion.		

FM 3.29	Describe and discuss child abuse and battered baby syndrome	K	K/KH	Y	At the end of the session, a student shall be able to: 3.29.1: Define child abuse or child maltreatment (as per WHO). 3.29.2 : Enumerate different forms of child abuse. 3.29.3 : Define battered baby syndrome. 3.29.4 : Describe the clinical findings and medicolegal aspects of battered baby syndrome. 3.29.5 : Discuss on Shaken baby syndrome and Cinderella syndrome. 3.29.6 : Discuss on Munchausen's Syndrome by proxy. 3.29.7 : Describe the medicolegal responsibilities of a doctor in child abuse cases.	Lecture, SGD	Written, Viva voce
FM 3.30	Describe and discuss issues relating to torture, identification of injuries caused by torture and its sequelae, management of torture survivors	K	K/KH	Y	At the end of the session, a student shall be able to: 3.30.1: Define Torture (as per UN Convention of Torture, World Medical Association). 3.30.2: Enumerate the types/methods/techniques used for torture. 3.30.3: Explain the medical findings in a case of torture. 3.30.4: Outline the management of torture survivors. 3.30.5: Discuss the ethical and legal issues related to torture.	Lecture, SGD	Written, Viva voce
FM 3.31	Torture and Human rights: Describe and discuss guidelines & protocols of National human rights commission regarding torture	K	K/KH	N	At the end of the session, a student shall be able to: 3.31.1: Describe the guidelines and protocols of National human rights commission in cases of torture.	SDL	Written, Viva voce

FM 3.32	Demonstrate the Professionalism while preparing reports in medicolegal situations,	A C	SH	Y	At the end of the session, a student shall be able to:	SGD	Written, Viva voce
	interpretation of findings and making inference/opinion, collection, preservation and dispatch of biological or trace evidences.				3.32.1 : Demonstrate the professionalism to be shown by a doctor while preparing reports in medicolegal cases, interpretation of findings and making inference/opinion. 3.32.2 : Demonstrate the professionalism to be shown by a doctor during the collection, preservation and dispatch of biological or trace evidences.		
FM 3.33	Should be able to demonstrate the professionalism while dealing with victims of torture and human right violations, sexual assaults- psychological consultation, rehabilitation	A C	K/K H/ SH	Y	At the end of the session, a student shall be able to: 3.33.1 : Demonstrate the professionalism to be shown by a doctor while dealing with victims of torture and human right violations. 3.33.2 : Demonstrate the professionalism to be shown by a doctor during the examination, psychological consultation and rehabilitation of sexual victims.	Lecture, SGD	Written, Viva voce

4. Medical Jurisprudence (Medical Law and Ethics)							
FM4.1	Describe Medical Ethics and explain its historical emergence.	K	KH	Y	At the end of class, a student shall be able to: 4.1.1 : Define Ethics and Medicaethics. 4.1.2 : Describe the historical emergence of Medicaethics. 4.1.3 : Discuss the need for and the emergence of World Medical Association's Declaration of Helsinki 1964 and its subsequent revisions.	Lecture, SGD	Written, Viva voce
FM4.2	Describe the Code of Medical Ethics 2002 conduct, Etiquette and Ethics in medical practice and unethical practices & the dichotomy.	K	KH	Y	At the end of class, a student shall be able to: 4.2.1 : Describe the 'Code of medical ethics' as per Indian Medical Council (Professional conduct, Etiquette and Ethics) Regulations, 2002. 4.2.2 : Enumerate the various practices of a medical practitioner which are considered as unethical. 4.2.3 : Explain the meaning of Dichotomy with examples. 4.2.4 : Mention guidelines laid down by MCI with respect to remuneration.	Lecture, SGD	Written, Viva voce
FM4.3	Describe the functions and role of Medical Council of India and State Medical Councils	K	KH	Y	At the end of class, a student shall be able to: 4.3.1 : Describe the constitution and functions of Medical Council of India/ National Medical Council. 4.3.2 : Describe the constitution and functions of State Medical Council.	Lecture, SGD	Written, Viva voce

FM4.4	Describe the Indian Medical Register	K	KH	Y	At the end of class, a student shall be able to: 4.4.1 : List the various particulars to be entered in Indian Medical Register (IMR). 4.4.2 : Mention under which schedules, the degrees obtained by institutions in and outside India are recognized by MCI. 4.4.3 : Describe the procedure for a foreign medical practitioner to get enrolled in IMR. 4.4.4 : Mention the advantages to a Doctor after enrolling in IMR.	Lecture, SGD	Written, Viva voce
FM4.5	Rights/privileges of a medical practitioner, infamous conduct, disciplinary Committee, disciplinary procedures, warning notice and penal erasure.	K	KH	Y	At the end of class, a student shall be able to: 4.5.1 : Enumerate the Rights/privileges of a medical practitioner 4.5.2 : Define Infamous conduct/Professional misconduct with suitable examples (as per IMC regulations, 2002) 4.5.3 : Describe the composition of disciplinary committee and its procedure in dealing with cases of infamous conduct. 4.5.4 : Discuss the various punishments awarded by disciplinary committee for infamous conduct (warning notice, temporary erasure, penal erasure).	Lecture, SGD	Written, Viva voce
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	At the end of class, a student shall be able to: 4.6.1 : Enumerate the laws related to medical practice in India. 4.6.2 : Describe the 'Duties of a medical practitioner' in general towards his patient, society and research.	Lecture, SGD	Written, Viva voce

FM4.7	Describe and discuss the ethics related to HIV patients	K	K/KH	Y	At the end of 3rd professional, a student should be able to: 4.7.1: Describe legal and ethical issues in HIV testing. 4.7.2 : Mention the rights of HIV positivepatients. 4.7.3 : Discuss the duties of a Doctor while treating HIV patients with respect to confidentiality &disclosure. 4.7.4 : Discuss the current policies related to the research and health care of HIV positivepatients.	Lecture, SGD	Written, Viva voce
FM4.8	Describe the Consumer Protection Act-1986 (Medical Indemnity Insurance, Civil	K	KH	Y	At the end of class, a student shall be able to: 4.8.1: Discuss on Consumer Protection Act-1986 in view of medical services with latest amendments.	Lecture, SGD	Written, Viva voce
	Litigations and Compensations), Workman's Compensation Act & ESI Act				4.8.2 : Describe the purpose of Medical Indemnity Insurancein civil litigations andcompensations. 4.8.3 : Discuss the role of a doctor in awarding compensationto workers or their dependents as per Workman's Compensation Act and ESI Act.		
FM4.9	Describe the medico - legal issues in relation to family violence, violation of human rights, NHRC and doctors	K	KH	N	At the end of class, a student shall be able to: 4.9.1 : Define DomesticViolence. 4.9.2 : Discuss the salient features of "Protection of women from domestic violence Act, 2005" in relation to medicaland legal responsibilities of a medicalpractitioner. 4.9.3 : Enumerate the cases related to violation of humanrights. 4.9.4 : Discuss the responsibilities of a doctor in casesof violationofhuman rights.	Lecture, SGD	No assessment

FM 4.10	Describe communication between doctors, public and media	K	KH	Y	At the end of class, a student shall be able to: 4.10.1: Describe the communication skills by a doctor with the public and its importance. 4.10.2: Describe the communication skills and precautions to be taken by a doctor while interacting with the media. 4.10.3: Describe communication skills by a doctor with his/her colleagues.	Lecture, SGD	Written, Viva voce
FM 4.11	Describe and discuss euthanasia	K	KH	Y	At the end of class, a student shall be able to: 4.11.1: Define euthanasia. 4.11.2: Describe various types of euthanasia. 4.11.3: Debate around euthanasia- the arguments against and in favour. 4.11.4: Mention the legal status of euthanasia in India and in other countries. 4.11.5: Discuss the landmark case of Aruna Shanbaug and its impact on the status of euthanasia in India.	Lecture, SGD	Written, Viva voce

FM 4.12	Discuss legal and ethical issues in relation to stem cell research	K	KH	Y	At the end the class, a student shall be able to: 4.12.1: Enumerate the application of stem cells in research and therapy. 4.12.2: Discuss the ethical issues arising from stem cell research and therapy. 4.12.3: Discuss the legal status of stem cell therapy and research in India. 4.12.4: Describe the guidelines for stem cell research in India.	Lecture, SGD	Written, Viva voce
FM 4.13	Describe social aspects of Medico-legal cases with respect to victims of assault, rape, attempted suicide, homicide, domestic violence, dowry- related cases	K	KH	Y	At the end of class, a student shall be able to: 4.13.1: Describe the social aspects and role of medical professionals with respect to victim of sexual violence. 4.13.2: Describe the social aspects and role of medical professionals with respect to victim of attempted suicide. 4.13.3: Describe the social aspects and role of medical professionals with respect to victim of attempted homicide. 4.13.4: Describe the social aspects and role of medical professionals with respect to victim of domestic violence.	Lecture, SGD	Written, Viva voce
FM 4.14	Describe & discuss the challenges in managing medico-legal cases including development of skills in relationship management – Human behaviour, communication skills, conflict resolution techniques	K	KH	Y	At the end of class, a student should be able to: 4.14.1: Discuss the challenges in managing the medico legal cases. 4.14.2: Describe the principles of doctor-patient relationship management. 4.14.3: Describe the development of human behavior and communication skills required for managing doctor-patient relationship. 4.14.4: Discuss the conflict resolution techniques in managing medico-legal cases.	Lecture, SGD	Written, Viva voce

FM 4.15	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	At the end of class, a student shall be able to: 4.15.1: Define stress. 4.15.2: Mention the types of pressure while dealing with medico-legal cases by a doctor. 4.15.3: List the causes/ sources of pressure in handling medico- legal cases. 4.15.4: Discuss the skills needed for managing the pressure situations in handling a medico-legal case.	Lecture, SGD	Written, Viva voce
FM 4.16	Describe and discuss Bioethics	K	KH	Y	At the end of class, a student shall be able to: 4.16.1: Define bioethics. 4.16.2: Enumerate the issues in medical practice wherein bioethics is applied. 4.16.3: Mention the four main principles of bioethics. 4.16.4 : Discuss the medico-legal issues related to bioethics in patient care.	Lecture, SGD	Written, Viva voce
FM 4.17	Describe and discuss ethical Principles: Respect for autonomy, non-maleficence, beneficence & justice	K	KH	Y	At the end of class, a student shall be able to: 4.17.1: Describe respect for patient's autonomy. 4.17.2: Describe the role of beneficence as a guiding principle in patient care. 4.17.3: Describe the role of non-maleficence as a guiding principle in patient care. 4.17.4 : Discuss the application of justice in distributing resources and benefits in medical practice and research.	Lecture, SGD	Written, Viva voce

FM 4.18	Describe and discuss medical negligence including civil and criminal negligence, contributory negligence, corporate negligence, vicarious liability, Res Ipsa Loquitur, prevention of medical negligence and defenses in medical negligence litigations	K	KH	Y	At the end of class, a student shall be able to: 4.18.1: Define medical negligence. 4.18.2: Describe the elements of medical negligence. 4.18.3: Describe civil and criminal negligence with examples. 4.18.4: Describe contributory negligence with examples. 4.18.5 : Describe the importance of Vicarious liability in medical practice. 4.18.6 : Describe Corporate Negligence with examples. 4.18.7: Describe Res Ipsa Loquitur with examples. 4.18.8: Mention the precautionary measures to be taken to avoid medical negligence. 4.18.9: Describe the various defenses for a doctor in medical negligence (including Contributory negligence, Therapeutic misadventure, Medical maloccurrence, Calculated risk doctrine, Novus actus interveniens, Res judicata etc).	Lecture, SGD	Written, Viva voce

FM 4.19	Define Consent. Describe different types of consent and ingredients of informed consent. Describe the rules of consent and importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication	K	KH	Y	At the end of class, a student shall be able to: 4.19.1: Define consent. 4.19.2: Describe the different types of consent with suitable examples. 4.19.3: Describe the ingredients of an informed consent. 4.19.4: Describe the rules and regulations associated with consent. 4.19.5: Explain the importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication (with relevant sections of IPC).	Lecture, SGD	Written, Viva voce

FM 4.20	Describe therapeutic privilege, Malingering, Therapeutic Misadventure (refer FM 4.18), Professional Secrecy (refer FM 4.24), Human Experimentation (refer FM 4.25)	K	KH	Y	At the end of class, a student shall be able to: 4.20.1: Explain the concept of ‘therapeutic privilege’ in medical practice. 4.20.2: Discuss the legal aspects of Malingering during medical practice.	Lecture, SGD	Written, Viva voce
FM 4.21	Describe Products liability and Medical Indemnity Insurance	K	KH	Y	At the end of class, a student shall be able to: 4.21.1: Discuss about ‘product liability’ in medical negligence. 4.21.2: Describe medical indemnity insurance and its purpose.	Lecture, SGD	Written, Viva voce
FM 4.22	Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath	K	KH	Y	At the end of class, a student shall be able to: 4.22.1: Explain oath as described by Hippocrates, Charaka and Sushruta. 4.22.3: Describe the procedure for administration of oath for a medical practitioner.	Lecture, SGD	Written, Viva voce
FM 4.23	Describe the modified Declaration of Geneva and its relevance	K	KH	Y	At the end of class, a student shall be able to: 4.23.1: Describe the components of declaration of Geneva. 4.23.2: Describe the components of modified declaration of Geneva. 4.23.3: Explain the relevance of Declaration of Geneva in the medical profession.	Lecture, SGD	Written, Viva voce
FM 4.24	Enumerate rights, privileges and duties of a Registered Medical Practitioner. Discuss doctor- patient relationship: professional secrecy and privileged communication	K	KH	Y	At the end of class, a student shall be able to: 4.24.1 : Enumerate the rights and privileges of Registered Medical Practitioner. 4.24.2 : Describe the duties of a Registered Medical Practitioner. 4.24.3 : Discuss on doctor-patient relationship in clinical practice. 4.24.4 : Explain professional secrecy with examples. 4.24.5 : Describe Privileged communication with examples.	Lecture, SGD	Written, Viva voce

FM 4.25	Clinical research & Ethics Discuss human experimentation including clinical trials	K	KH	N	At the end of class, a student shall be able to: 4.25.1: Enumerate the need and drawbacks of different types of clinical research on humans. 4.25.2: Describe the phases of clinical trials and its implications. 4.25.3: Describe the ethical regulations and guidelines for clinical research. 4.25.4: Discuss the principles pertaining to human experimentation in Nuremberg code and Belmont report. 4.25.5: Discuss the steps to be taken for protection of vulnerable population in clinical trials/research.	Lecture, SGD	Written, Viva voce
FM 4.26	Discuss the constitution and functions of ethics committee	K	KH	Y	At the end of class, a student shall be able to: 4.26.1 : List the composition of Institutional Ethics Committee (IEC). 4.26.2 : Mention the responsibilities and duties of IEC. 4.26.3 : Describe the proposals that are required to be presented before IEC. 4.26.4 : Discuss limitations of IEC.	Lecture, SGD	Written, Viva voce
FM 4.27	Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	K	KH	N	At the end of class, a student shall be able to: 4.27.1 : Describe the international and national ethics guidelines for human and animal research. 4.27.2 : Discuss the principles of ICMR guidelines for research involving human participants. 4.27.3 : Discuss the rights of human research participants. 4.27.4 : Discuss the 5 R's of animal research ethics.	Lecture, SGD	Written, Viva voce
FM 4.28	Demonstrate respect to laws relating to medical practice and Ethical code	A and C	SH	Y	At the end of class, a student shall be able to: 4.28.1: Demonstrate the conduct of doctor with patients as per the Code of Medical Ethics prescribed by IMC.	SGD (Role play, Case scenario,	OSPE

(Along with FM 4.24)	of conduct prescribed by Medical Council of India and rules and regulations prescribed by it from time to time.					Video)	
FM 4.29 (Along with FM 4.14, 4.15)	Demonstrate ability to communicate appropriately with media, public and doctors	A and C	K H/ SH	Y	At the end of class, a student shall be able to: 4.29.1 : Demonstrate the skills of communication by a doctor with the public. 4.29.2 : Demonstrate the skills of communication by a doctor with the media. 4.29.3 : Demonstrate the skills of communication by a doctor with his/her colleagues.	SGD (Role play, Case scenario, Video)	OSPE
FM 4.30	Demonstrate ability to conduct research in pursuance to guidelines or research ethics	A and C	K H/ SH	Y	At the end of class, a student shall be able to: 4.30.1 : Prepare a research protocol for a study as per the ICMR guidelines. 4.30.2 : Demonstrate the procedure of taking informed consent for conducting a research.	SGD (Role play, Case scenario, Video)	OSPE
5. Forensic Psychiatry							
FM5.1	Classify common mental illnesses including post-traumatic stress disorder (PTSD)	K	K/KH	Y	At the end of the session, a student shall be able to: 5.1.1 : Define Forensic Psychiatry. 5.1.2: Define mental illness. 5.1.3: Classify common mental illnesses. 5.1.4: Explain PTSD with examples.	Lecture, SGD	Written, Viva voce

FM5.2	Define, classify and describe delusions, hallucinations, illusion, lucid interval and obsessions with exemplification	K	K/KH	Y	At the end of the session, a student shall be able to: 5.2.1 : Definedelusion. 5.2.2 : Describe types of delusions and theirmedicolegal importance. 5.2.3 : Definehallucination. 5.2.4 : Describe types of hallucinations and theirmedicolegal importance. 5.2.5 : Define illusion withexamples. 5.2.6: Define lucidinterval. 5.2.7: Describe the medicolegal importance of lucidinterval. 5.2.8: DefineImpulse. 5.2.9: Describe impulsive disorders withexamples. 5.2.10: Describe the obsessive-compulsive disorders withexamples	Lecture, SGD	Written, Viva voce
FM5.3	Describe Civil and Criminal responsibilities of a mentally ill person	K	K/KH	Y	At the end of the session, a student shall be able to: 5.3.1: Describe Civil responsibility of a mentally ill person. 5.3.2 : Describe Criminal responsibility of a mentallyill person. 5.3.3 : Describe the McNaughten Rule and critics aboutit. 5.3.4: Discuss the alternate hypotheses/tests in relationto criminalresponsibility. 5.3.5: Describe the criminal responsibility in Automatism, Somnambulism, Somnolentia, Hypnotism andIntoxication.	Lecture, SGD	Written, Viva voce

FM5.4	Differentiate between true insanity from feigned insanity	K	K/KH	Y	At the end of the session, a student shall be able to: 5.4.1: Differentiate between true and feigned insanity.	Lecture, SGD	Written, Viva voce
FM5.5	Describe & discuss Delirium tremens	K	K/KH	Y	5.5.1: Define deliriumtremens. 5.5.2: Describe the criminal responsibility in deliriumtremens.	Lecture, SGD	Written, Viva voce
FM5.6	Describe the Indian Mental Health Care Act, 2017 with special reference to admission, care and discharge of a mentally ill person	K	K/KH	N	5.6.1: Describe the important definitions mentioned inMental Health Care Act, 2017(MHCA). 5.6.2: Describe the Rights of mentally ill person including ‘Advance directive’ as per theMHCA. 5.6.3: Describe the guidelines to start and run a ‘Mentalhealth establishment’. 5.6.4: Discuss on ‘Admission, Treatment and Dischargeof mentally ill person’ as described in theMHCA. 5.6.5: Discuss on punishment for violation of provisions of MHCA.	Lecture, SGD	No assessment

6. Forensic laboratory investigation in medicolegal practice							
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 histopathological examination, blood grouping, HLA Typing and DNA Fingerprinting. Describe Locard's Exchange Principle	K	K/KH	Y	At the end of class, a student shall be able to: 6.1.1 : Describe the importance of trace evidences in crime investigation. 6.1.2 : Explain Locard's principle of exchange in crime investigation. 6.1.3: Enlist the various trace evidences seen in different type of crimes (living and dead). 6.1.4: Discuss the importance of DNA profiling in forensic investigation. 6.1.5: Enlist body tissue and body fluid suitable for DNA profiling. 6.1.6: Discuss the importance of histopathology and cytology examination in forensic investigation. 6.1.7: Discuss importance of blood grouping in forensic investigation. 6.1.8: Discuss significance of HLA typing in forensic investigation.	Lecture, SGD	Written, Viva voce
FM6.2	Describe the methods of sample collection, preservation, labeling, dispatch, and interpretation of reports	K	K/KH	Y	At the end of class, a student shall be able to: 6.2.1: Describe method of collection, packing, labelling, sealing and dispatch of evidentiary materials to the laboratory. 6.2.2: Describe the method of interpretation of investigation reports like Chemical analysis, Histopathological examination, Microbiological examination etc.	Lecture, SGD	Written, Viva voce

FM6.3	Demonstrate professionalism while sending biological or trace evidences to Forensic Science lab, 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	K H/ SH	Y	At the end of class, a student shall be able to: 6.3.1: Draft requisition letter to be sent along with the samples preserved for laboratory analysis/examination mentioning type of sample preserved, required tests to be done, and brief history of the case. 6.3.2: Demonstrate professionalism while sending the samples for analysis such as maintaining confidentiality and chain of custody.	SGD	OSPE
7. Emerging technologies in Forensic Medicine							
FM7.1	Enumerate the indications and describe the principles and appropriate use for: - DNA profiling - Facial reconstruction - Polygraph (Lie Detector) - Narcoanalysis, - Brain Mapping, - Digital autopsy, - Virtual Autopsy, - Imaging technologies	K	K/KH	N	At the end of the class, a student shall be able to: 7.1.1: Discuss principle, procedure and medico-legal significance of DNA profiling. 7.1.2: Describe principle and medico-legal significance of Facial reconstruction. 7.1.3: Enlist different Lie detection tests. 7.1.4: Describe principle, procedure and medico-legal significance of Polygraph, Narcoanalysis and Brain mapping. 7.1.5: Describe principles of Virtual / Digital autopsy. 7.1.6: Describe the uses of different Imaging technologies in crime investigation.	Lecture, SDL	No assessment

8. General Toxicology							
FM8.1	Describe the history of Toxicology	K	K/KH	Y	At the end of the session, a student shall be able to: 8.1.1: Describe the history of Toxicology.	Lecture, SGD	Written, Viva voce
FM8.2	Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison	K	K/KH	Y	At the end of the session, a student shall be able to: 8.2.1: Define Toxicology, Forensic Toxicology, Clinical Toxicology and Poison.	Lecture, SGD	Written, Viva voce
FM8.3	Describe the various types of poisons, Toxicokinetics, Toxicodynamics and diagnosis of poisoning in living and dead	K	K/KH	Y	At the end of the session, a student shall be able to: 8.3.1 : Classify poisons in respect to mode of action and mode of usage. 8.3.2 : Describe pharmacokinetics & pharmacodynamics of the poisons. 8.3.3 : Explain the diagnosis of poisoning in the living individual. 8.3.4 : Explain the diagnosis of poisoning in the dead individual.	Lecture, SGD	Written, Viva voce
FM8.4	Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	K	K/KH	Y	At the end of the session, a student shall be able to: 8.4.1: Describe the legal sections related to poisoning in India. ✓ S. 85 IPC, S. 86 IPC, S. 274 IPC, S. 284 IPC, S. 299 IPC, S. 300 IPC, S. 304 (A) IPC, S. 375 IPC ✓ S. 324 IPC, S. 325 IPC, S. 326 IPC, S. 326A IPC, S. 326B IPC, S. 328 IPC ✓ S. 357 CrPc ✓ S. 185 IMV Act, S. 203 IMV Act, S. 204 IMV Act 8.4.2 : Describe Narcotic Drugs and Psychotropic Substances Act, 1985.	Lecture, SGD	Written, Viva voce

					8.4.3: Describe Karnataka Poisons (Possession and Sale) Rules, 2015. 8.4.4: Describe the legal responsibilities of a doctor in a case of poisoning.		
FM8.5	Describe Medico-legal autopsy in cases of poisoning including preservation and dispatch of viscera for chemical analysis	K	K/KH	Y	At the end of the session, a student shall be able to: 8.5.1: Explain the procedure of medico-legal autopsy in a suspected case of poisoning. 8.5.2: Describe the method of preserving the various viscera in a case of poisoning.	Lecture, SGD	Written, Viva voce
					8.5.3: Describe the procedure for dispatch of viscera for chemical analysis in a case of poisoning.		

FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India	K	K/KH	Y	At the end of the session, a student shall be able to: 8.6.1: Enumerate the common poisons encountered in India. 8.6.2: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Organophosphate poisoning. 8.6.3: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Copper sulphate poisoning. 8.6.4: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Aluminum and Zinc Phosphide poisoning. 8.6.5: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Paracetamol poisoning. 8.6.6 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Benzodiazepines poisoning.	Lecture, SGD	Written, Viva voce

FM8.7	Describe simple Bedside clinic tests to detect poison/ drug in a patient's body fluids	K	K/KH	Y	At the end of the session, a student shall be able to: 8.7.1: Describe the bedside clinic tests for Hydrochloric acid poisoning (Ammonia test, Litmus paper test, Silver nitratetest). 8.7.2: Describe the bedside clinic tests for Nitricacid poisoning (Ferrous Sulphatetest). 8.7.3: Describe the bedside clinic tests for Sulphuric acid poisoning(Litmus papertest). 8.7.4: Describe the bedside clinic tests for Oxalicacid poisoning (Barium nitratetest). 8.7.5: Describe the bedside clinic tests for Caustic alkalis poisoning (Litmus papertest).	Lecture, SGD	Written, Viva voce
					8.7.6: Describe the bedside clinic tests for Phenol (FolinCiocaltaeu reagenttest). 8.7.7: Describe the bedside clinic tests for Salicylates(Trinder's reagenttest).		
FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	K	K/KH	Y	At the end of the session, a student shall be able to: 8.8.1 : List the general treatment procedure in case ofpoisoning. 8.8.2 : Explain the procedure of Gastriclavage. 8.8.3 : Enumerate the indications and contraindications forGastric lavage. 8.8.4 : Defineantidote. 8.8.5 : Describe the various types ofAntidotes. 8.8.6 : Explain Chelation therapy. 8.8.7 : Describe the methods for hastening elimination ofabsorbed poison.	Lecture, SGD	Written, Viva voce

FM8.9	Describe the procedure of intimation of suspicious cases or actual cases of foul play to the police, maintenance of records, preservation and dispatch of relevant samples for laboratory analysis.	K	K/KH	Y	At the end of the session, a student shall be able to: 8.9.1: Describe the procedure of intimation of suspicious cases or actual cases of foul play to the police • S. 39 CrPC, S. 40 CrPC, S. 175CrPC. • S. 166 (B) IPC, S. 176 IPC, S. 177 IPC, S. 201 IPC, S. 202 IPC. 8.9.2: Describe the procedure of record maintenance in a case of poisoning. 8.9.3: Describe the procedure of collection and dispatch of viscera for chemical analysis in a case of poisoning.	Lecture, SGD	Written, Viva voce
FM 8.10	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	At the end of the session, a student shall be able to: 8.10.1: List the various analytical methods used in Toxicology. 8.10.2: Describe the general principle of Thin Layer Chromatography. 8.10.3: Describe the basic principle and uses of Gas Chromatography. 8.10.4: Describe the basic principle and uses of Liquid Chromatography. 8.10.5: Describe the basic principle and uses of Atomic Absorption Spectroscopy. 8.10.6: Describe the basic principle and uses of Mass Spectrometry. 8.10.7: Describe the basic principle and uses of Radio Immuno Assay.	Lecture, SGD	Written, Viva voce

9. Chemical Toxicology							
FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric and hydrochloric acids; Organic- Carbolic acid (phenol), Oxalic and Acetyl salicylicacids	K	K/KH	Y	At the end of the session, a student shall be able to: 9.1.1: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Sulphuric acidpoisoning. 9.1.2: Describe the characteristics, mechanism of action,fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Nitric acidpoisoning. 9.1.3: Describe the characteristics, mechanism of action,fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Hydrochloric acid poisoning. 9.1.4: Discuss onVitriolage. 9.1.5: Describe the characteristics, pharmacokinetics,mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Carbolic acid poisoning. 9.1.6: Discuss onCarboluria. 9.1.7: Describe the characteristics, pharmacokinetics,mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Oxalic acid poisoning. 9.1.8: Discuss onOxaluria. 9.1.9: Describe the characteristics, pharmacokinetics,mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects ofAcetylsalicylic acid poisoning.	Lecture, SGD	Written, Viva voce

FM9.2	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced	K	K/KH	Y	At the end of the session, a student shall be able to: 9.2.1: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Phosphorus poisoning. 9.2.2: Discuss on Phossyjaw.	Lecture, SGD	Written, Viva voce
	elimination with regard to Iodine, Phosphorus, Barium				9.2.3: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Iodine poisoning. 9.2.4: Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Barium poisoning.		

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	At the end of the session, a student shall be able to: 9.3.1 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Arsenic poisoning. 9.3.2 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Lead poisoning. 9.3.3 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Mercury poisoning. 9.3.4 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Copper poisoning. 9.3.5 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Iron poisoning. 9.3.6 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Thallium poisoning. 9.3.7 : Describe the characteristics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Cadmium poisoning. 9.3.8 : Describe the causes, clinical features and treatment of Metallic fume fever.	Lecture, SGD	Written, Viva voce

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	At the end of the session, a student shall be able to: 9.4.1: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of ethanol intoxication. 9.4.2: Define drunkenness. 9.4.3: Describe the methods of detection of drunken person in legal situations. 9.4.4: Describe clinical features, treatment and medicolegal aspects of chronic alcoholism. 9.4.5: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects in a case of methanol poisoning. 9.4.6: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment and medicolegal aspects of ethylene glycol poisoning.	Lecture, SGD	Written, Viva voce

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	At the end of the session, a student shall be able to: 9.5.1: Classify agricultural poisons. 9.5.2: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Organophosphorous poisoning. 9.5.3: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Carbamate poisoning. (Integration with Dept of General Medicine)	Lecture, SGD	Written, Viva voce

				9.5.4 : Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatalperiod, clinical features, treatment, postmortem findings and medicolegal aspects of Organo-chlorinepoisoning. 9.5.5 : Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Paraquatpoisoning. 9.5.6: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findingsand medicolegal aspects of Pyrethroidpoisoning. 9.5.7: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatalperiod, clinical features, treatment, postmortem findings and medicolegal aspects of Aluminum and Zincphosphide poisoning.		

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	At the end of the session, a student shall be able to: 9.6.1: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Ammonia poisoning. 9.6.2: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings & medicolegal aspects of Carbon monoxide poisoning. 9.6.3: Describe physical/chemical characteristics, pharmacokinetics, mechanism of action, fatal dose, fatal period, clinical features, treatment, postmortem findings and medicolegal aspects of Cyanide poisoning. 9.6.4: Describe physical/chemical characteristics, mechanism of action, clinical features, treatment, postmortem findings and medicolegal aspects of Methyl Isocyanate poisoning. 9.6.5 : Describe clinical features, treatment and medicolegal aspects of exposure to tear gas (in riot control).	Lecture, SGD	Written, Viva voce

10. Pharmaceutical toxicology							
FM 10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: - Antipyretics – Paracetamol, Salicylates - Anti-Infectives (Common antibiotics – an overview) - Neuropsychotoxicology Barbiturates, benzodiazepines, phenytoin, lithium, haloperidol, neuroleptics, tricyclics - Narcotic Analgesics, Anaesthetics, and Muscle Relaxants - Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis - Gastro-Intestinal and Endocrinal Drugs – Insulin	K	K/KH	Y	At the end of the session, a student shall be able to: 10.1.1: Describe clinical features, treatment and medico-legal aspects of poisoning due to Antipyretics (such as Paracetamol and Salicylates). 10.1.2: Describe clinical features, treatment and medico-legal aspects of poisoning due to Anti-Infective overdose (common antibiotics). 10.1.3: Describe clinical features, treatment, post-mortem findings and medico-legal aspects of Barbiturate poisoning. 10.1.4: Describe clinical features, treatment and medico-legal aspects of Benzodiazepine poisoning. 10.1.5: Describe clinical features, treatment, post-mortem findings and medico-legal aspects of opium and its alkaloids. 10.1.6: Describe clinical features, treatment, post-mortem findings and medico-legal aspects of poisoning due to Gastro- Intestinal and Endocrinal Drugs (e.g., Insulin). 10.1.7: Enumerate the cardiotoxic plants. 10.1.8: Describe the active principles, mechanism of action, fatal dose, fatal period, clinical features, treatment, post-mortem findings and medico-legal aspects of poisoning due to cardiotoxic plants. (Integration with Dept of General Medicine and Dept of Psychiatry)	Lecture, SGD	Written, Viva voce

11. Biotoxology							
FM 11.1	Describe features and management of Snake bite, scorpion sting, bee and wasp sting and spider bite	K	K/KH	Y	At the end of the session, a student shall be able to: 11.1.1 : Differentiate poisonous and non-poisonous snakes. 11.1.2 : Classify poisonous snakes. 11.1.3 : Identify the common poisonous and non-poisonous snakes in India.	Lecture, SGD	Written, Viva voce
					11.1.4 : Describe mechanism of action, clinical features, management, postmortem findings and medicolegal aspects of snake bite (Ophitoxaemia). 11.1.5 : Identify the common scorpions seen in India. 11.1.6: Describe mechanism of action, clinical features, management, postmortem findings and medicolegal aspects of scorpion sting. 11.1.7: Describe mechanism of action, clinical features, management, postmortem findings and medicolegal aspects of bee and wasp sting, and spider bite.		

12. Sociomedical Toxicology							
FM 12.1	Describe features and management of abuse/ poisoning with following chemicals: Tobacco, cannabis, amphetamines, cocaine, hallucinogens, designer drugs & solvent	K	K/KH	Y	At the end of the session, a student shall be able to: 12.1.8 : Define drug abuse, drug addiction, drug habituation and drug dependence. 12.1.9 : List the drugs of abuse. 12.1.10 : Describe clinical features, treatment, post-mortem findings and medico-legal aspects of acute and chronic tobacco poisoning. 12.1.4: Enumerate the active principles and various preparations of cannabis. 12.1.5: Describe clinical features, treatment, post-mortem findings and medico-legal aspects of acute and chronic cannabis poisoning. 12.1.6: Describe clinical features, treatment, post-mortem findings and medico-legal aspects of acute and chronic cocaine poisoning. 12.1.7: Describe clinical features, treatment, post-mortem findings and medico-legal aspects of amphetamine poisoning. 12.1.11 : Enlist hallucinogenic substances. 12.1.12 : Describe clinical features, treatment, post-mortem findings and medico-legal aspects of Lysergic acid diethylamide poisoning. 12.1.13 : Define 'Designer drug'. 12.1.14 : Describe the clinical features and management of common designer drugs. 12.1.15 : Define 'Solvent abuse'. 12.1.16 : Describe clinical features, treatment, post-mortem findings and medico-legal aspects of Solvent abuse. 12.1.17 : Discuss on Body packer's syndrome.	Lecture, SGD	Written, Viva voce

13. Environmental toxicology							
FM 13.1	Describe toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation & industry	K	K/KH	Y	At the end of the session, a student shall be able to: 13.1.1: Enumerate the causes for environmental pollution. 13.1.2: Describe the health effects of environmental pollution due to toxic substances. 13.1.3 : Describe the medico-legal aspects of toxic hazards on employees of an industry.	Lecture, SGD	Written, Viva voce
FM 13.2	Describe medico-legal aspects of poisoning in Workman's Compensation Act	K	K/KH	Y	At the end of the session, a student shall be able to: 13.2.1: Describe the medico-legal issues arising out of effects of poisoning due to occupational exposure as per Workman's Compensation Act. 13.2.2 : Discuss the role of physician in cases of poisoning due to occupational exposure.	Lecture, SGD	Written, Viva voce

Teaching Learning methods:

Didactic lecture, Self-directed learning (SDL), Small group teaching (Case-based learning, Problem-based learning, Tutorials, Seminars, etc), Integrated teaching.

Assessment methods:

MCQs, Long essay, Short essay, Short answer questions, Viva voce.

14. Skills in Forensic Medicine & Toxicology

No.	COMPETENCY The student should be able to	Domain K/S/ A/C	Level K/KH/SH/ P	Core (Y/N)	SLOs	TLMs	Assessment Method
FM 14.1	Examine and prepare Medico-legal report of an injured person with different aetiologies in a simulated/ supervised environment	S	SH/P	Y	At the end of the session, learner shall be able to: 14.1.1: Take an informed consent from the Patient / Guardian after explaining the importance of MLC registration in Medicolegal cases (Road traffic accident / Fall from height / Assault / Self infliction of injuries / Burns / Firearms).	Videos of consent taking in MLC. Bedside clinic (ward/casualty). Skill lab using standardized patients.	OSPE – Writing the informed consent for MLC
					14.1.2: Perform the clinical examination of an injured person (history taking, general physical examination, systemic examination, laboratory investigations) in a simulated/ supervised environment.	Bedside clinic (ward/casualty). Skill lab (Part-task trainer with moulage). Photographs of injuries with measuring tape.	OSPE – Part-task trainer with moulage in skill lab, OR Photographs of injuries with measuring tape
					14.1.3: Prepare the wound certificate after documenting the clinical findings. 14.1.4: Prepare the police intimation.	Filling the observation in the format of MLC registration Filling the format of Police intimation	OSPE – Prepare wound certificate OSPE – Prepare police intimation

FM 14.2	Demonstrate the correct technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment	S	SH	Y	At the end of the session, learner shall be able to: 14.2.1: Take an informed consent from the Patient / Guardian after explaining the importance of MLC registration in Poisoning cases.	Videos of consent taking. Bedside clinic (ward/ casualty). Skill lab using standardised patients.	OSPE – Writing the informed consent for poisoning case
					14.2.2: Perform the clinical examination (history taking, general physical examination, systemic examination, laboratory investigations, differential diagnosis) in poisoning cases in a simulated/ supervised environment.	Bedside clinic (Ward/casualty). Skill lab (High-fidelity mannequin). Interpretation of case examples.	OSPE – High-fidelity mannequin in skill lab, OR Interpretation of case examples
					14.2.3: Prepare the medicolegal certificate after documenting the clinical findings.	Filling the observation in the format of MLC registration.	OSPE – Prepare medicolegal certificate
					14.2.4: Prepare the police intimation.	Filling the format of Police intimation.	OSPE – Prepare police intimation
FM 14.3	Assist and demonstrate the proper technique in collecting, preserving and dispatch of the exhibits in a suspected case of poisoning, along with clinical	S	SH	Y	At the end of the session, learner shall be able to: 14.3.1: Demonstrate the process of collecting, preserving and dispatch of the materials/ exhibits in a suspected case of ingested poisoning . 14.3.2: Demonstrate the process of	Small Group discussion with DOAP session (Hands on training of packing, sealing and labelling of evidentiary materials).	OSPE – List evidentiary materials in poisoning. Demonstrate the technique of

	examination				collecting, preserving and dispatch of the materials/ exhibits in a suspected case of inhalation poisoning along with clinicalexamination. 14.3.3: Demonstrate the process of collecting, preserving and dispatch of the materials/ exhibits in a suspected case of injected poisoning along with clinicalexamination.		preservation of materials. Prepare letters and labels for dispatch of evidentiary materials.

FM 14.4	Conduct and prepare report of estimation of age of a person for medico-legal and other purposes & prepare medico-legal report in a simulated/ supervised environment	S	KH	Y	At the end of the session, learner shall be able to:	Videos on informed consent. SGD – Explain the procedure of taking consent.	OSPE – Writing the informed consent for age estimation.
					14.4.1: Explain the procedure of taking an informed consent from a person after explaining the importance and procedure of age estimation in criminal cases (accused/ victim of a crime) and civil cases (joining employment, obtaining pension, etc).		
					14.4.2: Estimate the age of a person by using physical, dental and radiological findings.	Age estimation of a person by physical and dental examination along with supplemented radiological findings. Case Based Learning (CBL) - Interpret the findings of physical, dental and radiological examination of a given case.	OSPE – Estimate age in a given case (physical, dental and radiological findings) and draft age certificate.
					14.4.3: Prepare the medicolegal report on the age of a person.	Draft the age estimation certificate as per the format.	

FM 14.5	Conduct & prepare post- mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment	S	KH	Y	At the end of the session, learner shall be able to: 14.5.1: Describe the techniques of conducting a medicolegal autopsy. 14.5.2 : Describe the postmortem findings (external and internal) in a medicolegal autopsy. 14.5.3: Enumerate the ancillary investigations required (along with appropriate materials for such investigations) in a medicolegal autopsy. 14.5.4: Draft the postmortem report after a medicolegal autopsy. Medicolegal autopsies may be a case of unnatural death, natural death, custodial death, alleged medical negligence, decomposed body, mutilated body.	Autopsy demonstration followed by discussion (SGD).	OSPE – Case example with details of a medicolegal case (containing history, postmortem findings, investigation details) – ask to draft PM report and few questions of analysing category (based on given PM findings). Practical book/ Log book. Viva voce.

FM 14.6	Demonstrate and interpret medico-legal aspects from examination of hair (human & animal) fibre, semen & other biological fluids	S	KH	Y	At the end of the session, learner shall be able to: 14.6.1: Identify hair (human/ animal), other fibres by physical and microscopic examination and describe its medicolegal importance. 14.6.2: Identify the semen by physical and microscopic examination and describe its medicolegal importance.	SGD on method of examining the hair, fibre and semen. Microscopic examination of hair, fibre and semen. Demonstration by faculty about chemical methods used for identification of semen.	OSPE – Microscopic identification of hair/semen. Practical book/ Logbook. Vivavoce

FM 14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin	S	KH	Y	At the end of the session, learner shall be able to: 14.7.1 : Identify the blood by physical and microscopic examination. 14.7.2 : Explain the various medicolegal conclusions by examining the bloodstains. 14.7.3 : Explain the method of identifying the species of origin of the bloodstain.	SGD on method of examining the blood. Microscopic examination of blood. Demonstration by faculty about chemical methods used for identification of blood.	OSPE – Microscopic identification of blood. Practical book/ Log book Viva voce
FM 14.8	Demonstrate the correct technique to perform and identify ABO & Rh blood group of a person.	S	SH	Y	At the end of the session, learner should be able to: 14.8.1: Perform the technique of identifying the ABO blood group of a person. 14.8.2: Perform the technique of identifying the Rh blood group of a person. (This competency will be taught and assessed by Dept of Physiology)	Small group discussion, DOAP session on blood grouping technique.	OSPE – Perform the technique of blood grouping. Practical book/ Log book
FM 14.9	Demonstrate examination of & present an opinion after examination of skeletal remains in a simulated/ supervised environment	S	SH	Y	At the end of the session, learner should be able to: 14.9.1: Enumerate the objectives of skeletal remain examination. 14.9.2: Demonstrate the procedure of examination of skeletal remains in a simulated/ supervised environment.	Small group discussion (Practical session)	OSPE – Demonstration of skeletal remains examination. Practical book/ Log book
					14.9.3: Draft a medicolegal report and opinion after examination of skeletal remains.		Viva voce

FM 14.10	Demonstrate ability to identify & prepare medicolegal inference from specimens obtained from various types of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of bone	S	KH	Y	At the end of the session, learner should be able to: 14.10.1: Prepare a medicolegal inference from photographs showing various types of injuries/ lesions/ postmortem findings. 14.10.2 : Prepare a medicolegal inference from wet specimens showing various types of injuries/ lesions/ postmortem findings. 14.10.3: Prepare medicolegal inference from models showing various types of injuries/ lesions/ postmortem findings.	Small group discussion (Practical session)	OSPE – Preparation of medicolegal inference from photograph/ wet specimen/ model. Practical book/ Log book Viva voce

FM 14.11	To identify & describe weapons of medicolegal importance which are commonly used e.g. . lathi, knife, axe, Iron rod, dagger, razor, Glass piece, Scissors, Chopper, Hockey stick, Bansdola sticks etc., Able to prepare report	S	KH	Y	At the end of the session, learner should be able to: 14.11.1 : Document the information before commencing the weapon examination. 14.11.2 : Examine and document the details of weapons of medicolegal importance. 14.11.3 : Prepare a report on the weapon examined. 14.11.4 : Opine whether the injuries present in the wound certificate/ postmortem report are possible to be caused by the weapon examined. 14.11.5 : Explain the method of packing and handing over the weapon to concerned police (maintaining the chain of custody).	Small group discussion (Hands on training of examination, packing, sealing and labelling of the weapon) - Practical session	OSPE – Preparation of medicolegal report and opinion on injuries mentioned in wound certificate/ postmortem 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. (Prepared injury report/ PM report must be provided to connect the weapon with the injuries)						Practical book/ Log book Viva voce

FM 14.12	Describe the contents and structure of bullet and cartridges used & to provide medico-legal interpretation from these.	S	KH	Y	At the end of the session, learner should be able to: 14.12.1 : Describe the structure and contents of Rifled cartridge & prepare a medico-legal inference. 14.12.2 : Describe the structure and contents of Shotgun cartridge & prepare a medico- legalinference.	Small group discussion (Practical session)	OSPE – Identify the cartridge and write medicolegal inference related to injuries mentioned in wound certificate/ postmortem report. Practical book/ Log book Viva voce
FM 14.13	To estimate the age of foetus by post- mortem examination	S	KH	Y	At the end of the session, learner should be able to: 14.13.1: Enumerate the objectives of foetal autopsy. 14.13.2: Describe the procedure of foetal autopsy. 14.133 : Estimate the age of foetus by examination of ossification centres, anthropometric measurements, blood constituents, hair, nail, umbilical cordetc. 14.134 : Draft a medicolegal report and opinion after foetalautopsy.	Foetal autopsy demonstration. Videos of foetalautopsy demonstration. Small group discussion with case example.	OSPE – Preparation of medicolegal report and opinion on foetal autopsy. Practical book/ Log book Viva voce

FM 14.14	To examine & prepare report of an alleged accused in rape/ unnatural sexual offence in a simulated/ supervised environment	S	KH	Y	At the end of the session, learner should be able to: 14.14.1 : Take an informed consent for examination of an accused of sexual offence. 14.14.2 : Describe the procedure of examination and collection of evidentiary material for medical and medicolegal purposes. 14.14.3 : Prepare a medicolegal report and opinion in an alleged accused of sexual offence. 14.14.4 : Explain the procedure of handing over the evidentiary material to the investigating officer.	Videos showing examination of an accused of sexual offence/ Small group discussion with case vignette / Examination using part-task trainer with moulage in skills lab. Drafting report using a format. Preparing legal forms of maintaining chain of custody.	OSPE – Examination of an accused of sexual assault (case vignette with analysis type of questions/ Part-task trainer in skills lab). Practical book/ Log book Viva voce

FM 14.15	To examine and prepare medico-legal report of a victim of sexual offence/ unnatural sexual offence in a simulated/ supervised environment	S	KH	Y	At the end of the session, learner should be able to: 14151 : Take an informed consent for examination of a victim of sexualoffence. 14152 : Describe the procedure of examination and collection of evidentiary material for medical and medicolegalpurposes. 14153 : Prepare a medicolegal reportand opinion in a victim of sexualoffence. 14154 : Explain the procedure of handing over the evidentiary material to the investigating officer.	Videos showing examination of victim of sexual offence/ Small group discussion with case vignette / Examination using part- task trainer with moulage in skillslab. Drafting report using a format. Preparing legal forms of maintaining chain of custody.	OSPE – Examination of victim of sexual assault (case vignette with analysis type of questions/ Part-task trainer in skills lab). Practical book/ Log book Viva voce

FM 14.16	To examine & prepare medico-legal report of drunk person in a simulated/ supervised environment	S	KH	Y	At the end of the session, learner should be able to: 14.16.1 : Take an informed consent for examination of a person with alleged drunkenness. 14.16.2 : Describe the procedure of examination and collection of evidentiary material for medicolegal purpose. 14.16.3 : Prepare a medicolegal report and opinion in a drunkenness case. 14.16.4 : Explain the procedure of handing over the evidentiary material to the investigating officer.	Videos showing examination of drunkenness case/ Small group discussion with case vignette / Examination using standardised patient. Drafting report using a format. Preparing legal forms of maintaining chain of custody.	OSPE – Examination of drunkenness case (case vignette – drafting report with analysis type of questions). Practical book/ Log book Viva voce

FM 14.17	To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticide compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	S	KH	Y	At the end of the session, learner should be able to: 14.17.1: Identify with physical and /or chemical characteristics of the common poisons e.g. dhatura, castor, cannabis, opium, aconite, copper sulphate, pesticide compounds, marking nut, oleander, Nux vomica, abrus seeds, snakes, capsicum, calotropis, lead compounds & tobacco. (<i>regional / local poisons</i>) 14.17.2: Draw the medico-legal inferences with the use of the common poisons.	Small group discussion	OSPE – Identification of a given poison and its medicolegal inference. Practical book/ Logbook Viva voce

FM 14.18	To examine & prepare medico-legal report of a person in police, judicial custody or referred by Court of Law and violation of human rights as requirement of NHRC, who has been brought for medical examination	S	KH	Y	At the end of the session, learner should be able to: 14.18.1 : Explain the procedure of examination and preparing the medico-legal report of a person in police custody/ judicial custody who has been brought for medical examination. 14.18.2 : Explain the procedure of examination and preparing the medico-legal report of a person referred by Court of Law for medical examination. 14.18.3: Explain the procedure of examination and preparing the medico-legal report of a person with history of violation of human rights as per requirement of NHRC (victim of torture, hunger strike, etc), who has been brought for medical examination.	Small group discussion. Drafting a medico-legal report using the format.	Practical book/ Log book Viva voce

FM 14.19	To identify & prepare medico-legal inference from histopathological 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	At the end of the session, learner should be able to: 14.19.1 : List the microscopic identifying features after examining the histopathological slides of myocardial Infarction, pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain haemorrhage, bone fracture, pulmonary oedema, brain oedema, soot particles, diatoms & wound healing. 14.19.2 : Describe the medico-legal inferences after examining the above mentioned histopathological slides.	Small group discussion with microscopic demonstration of histopathological slides.	OSPE – Identification of a given histopathological slide and its medico-legal inference. Practical book/ Log book Viva voce
FM 14.20	To record and certify dying declaration in a simulated environment	S	KH	Y	At the end of the session, learner should be able to: 14.20.1 : Certify compos mentis (sound mind) by examining higher mental functions before recording of dying declaration in a simulated environment. 14.20.2 : Record dying declaration in a simulated environment. 14.20.3 : Assist the executive magistrate in recording of dying declaration in a simulated environment	Small group discussion, Role Play/ Standardised patient in simulated environment	Log book/ Skill station/ Viva voce /OSCE

FM 14.21	To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.	S	KH	Y	At the end of the session, learner should be able to: 14.21.1 : Describe the procedure involved in collecting, preserving, sealing and dispatching exhibits for DNA profiling from a living individual. 14.21.2 : Describe the procedure involved in collecting, preserving, sealing and dispatching exhibits for DNA profiling from a dead individual after conducting medicolegal autopsy. 14.21.3 : Describe the procedure involved in collecting samples for DNA profiling depending on the laboratory policies of collecting blood on dry gauze or EDTA vacutainer or on FTA cards,	Small group discussion. Demonstration of the procedure of collecting, preserving and dispatching the evidentiary materials for DNA fingerprinting (by faculty). Videos showing above procedure.	Practical book/ Log book Viva voce
FM 14.22	To give expert medical/ medico- legal evidence in Court of law	S	KH	Y	At the end of the session, learner should be able to: 14.22.1 : Describe the conduct of a doctor in the witness box during the process of deposing expert medical/ medico-legal evidence in Court of law. 14.22.2 : Describe the steps /procedure of recording of expert medical/ medico-legal evidence in Court of law with relation to Court procedures.	Small group discussion. Role play/Mock court/ Video of court room proceedings Court visits.	Practical book/ Log book Viva voce

List of Competencies to cover in each phase of MBBS Competencies in Phase II MBBS

Serial number	Topic	Competency number	Competency	Teaching hours and type
1	General Information	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	Lecture – 1 hr (Orientation class)
2		FM1.2	Describe history of Forensic Medicine	
3	Forensic Pathology	FM2.1	Define, describe and discuss death and its types including somatic/clinical/cellular, molecular and brain-death, Cortical Death and Brainstem Death	Lecture – 1 hr (Interactive)
4		FM2.2	Describe and discuss natural and unnatural deaths	
5		FM2.3	Describe and discuss issues related to sudden natural deaths	
6		FM2.4	Describe salient features of the Organ Transplantation and The Human Organ Transplant (Amendment) Act 2011 and discuss ethical issues regarding organ donation	SDL – 1 hr (Followed by reflective writing)
7		FM2.5	Discuss moment of death, modes of death - coma, asphyxia and syncope	Lecture – 1 hr (Interactive)
8		FM2.6	Discuss presumption of death and survivorship	
9		FM2.7	Describe and discuss suspended animation	
10		FM2.10	Discuss estimation of time since death	SGD – 2 hrs

11		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	
12		FM2.9	Describe putrefaction, mummification, adipocere and maceration	SGD – 1 hr
13		FM2.11	Describe and discuss autopsy procedures including post-mortem examination, different types of autopsies, aims and objectives of post-mortem examination	Lecture – 1 hr
14		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	
15		*FM8.5	Describe Medico-legal autopsy in cases of poisoning including preservation and dispatch of viscera for chemical analysis	
16		*FM8.9	Describe the procedure of intimation of suspicious cases or actual cases of foul play to the police, maintenance of records, preservation and dispatch of relevant samples for laboratory analysis.	
17		FM2.12	Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post-mortem examination	Lecture – 1 hr
18		FM2.13	Describe and discuss obscure autopsy	
19		FM2.17	Describe and discuss exhumation	
20		FM2.16	Describe and discuss examination of mutilated bodies or fragments, charred bones and bundle of bones	SGD – 4 hrs (Practical)
21		*FM14.9	Demonstrate examination of & present an opinion after examination of skeletal remains in a simulated/ supervised environment	
22		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	SGD – 1 hr

23		FM2.31	Demonstrate ability to work in a team for conduction of medico-legal autopsies in cases of death following alleged medical negligence, dowry death, death in custody or following violation of human rights as per National Human Rights Commission Guidelines on exhumation	SGD – 1 hr
24		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	SDL – 1 hr
25		FM2.15	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	SDL – 1 hr
26		FM2.32	Demonstrate ability to exchange information by verbal or nonverbal communication to the peers, family members, law enforcing agency and judiciary	SGD – 1 hr
27		FM2.33 & FM2.34	Demonstrate ability to use local resources whenever required like in mass disaster situations	
28		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	
29	Clinical Forensic Medicine	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, medicolegal aspects of age	SGD – 2 hrs
30		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& superimposition	SGD – 1 hr
31		*FM14.6	Demonstrate and interpret medico-legal aspects from examination of hair (human & animal) fibre, semen & other biological fluids	SGD – 2 hrs (Practical)
32		*FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin	
33		*FM14.8	Demonstrate the correct technique to perform and identify ABO & RH blood group of a person	

34	Toxicology : General Toxicology	FM8.1	Describe the history of Toxicology	SDL – 1 hr
35		FM8.2	Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison	Lecture – 1 hr
36		FM8.3	Describe the various types of poisons, Toxicokinetics, and Toxicodynamics and diagnosis of poisoning in living and dead	
37		FM8.4	Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	
38		FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India	
39		FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	Lecture – 1 hr
40		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	Lecture – 1 hr
41		*FM14.2	Demonstrate the correct technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment	SGD – 2 hrs (Practical/ Skills lab)
42		*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	
43		FM8.7	Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids	
44	Toxicology : Chemical Toxicology	FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric, and hydrochloric acids; Organic-Carboic Acid (phenol), Oxalic and acetylsalicylic acids	SGD – 2 hrs

45		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	Lecture – 1 hr
46		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	Lecture – 2 hrs
47		FM9.4	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	Lecture – 2 hrs
48		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	SGD – 2 hrs (Integration – Pharmacology)
49		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	SGD – 1 hr
50	Toxicology : Pharmaceutical Toxicology	FM10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepines, phenytoin, lithium, haloperidol, neuroleptics, tricyclics	SDL – 1 hr (Integration – Pharmacology)
			iv. Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Gastro-Intestinal and Endocrinal Drugs – Insulin	

51		FM10.1 vi	vi. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis	Lecture – 1 hr
52	Toxicology : Biotoxicology	FM11.1	Describe features and management of Snake bite, scorpion sting, bee and wasp sting and spider bite	SGD – 2 hrs
53	Toxicology : Environmental Toxicology	FM13.1	Describe toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry	Lecture – 1 hr
54		FM13.2	Describe medico-legal aspects of poisoning in Workman's Compensation Act	
55	Toxicology : Sociomedical Toxicology	FM12.1	Describe features and management of abuse/ poisoning with following chemicals: Tobacco, cannabis, amphetamines, cocaine, hallucinogens, designer drugs & solvent	Lecture – 2 hrs
56	Skills in Forensic Medicine & Toxicology	FM14.17	To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	SGD – 2 hrs (Practical)
57		FM14.5	Conduct & prepare post-mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment	SGD – 5 hrs (5 cases)
58		FM14.19*	To identify & prepare medico-legal inference from histo-pathological slides of Myocardial Infarction, pneumonitis, tuberculosis, brain infarct, liver cirrhosis, Pulmonary oedema, <i>(remaining slides will be covered in phase 3 MBBS)</i>	SGD – 1 hr*(Practical) Integration Pathology

Lecture – 15 hours;

SGD (small group discussion) –30hours;

(Practical classes marked in green colour) SDL (self-directed learning) –5hours; (marked in yellow colour)

Competencies in Phase III part 1 MBBS

Serial number	Topic	Competency number	Competency	Teaching hours and type
1	General Information	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	SDL – 1 hr
2		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	
3		FM1.6	Describe Offenses in Court including Perjury; Court strictures vis-a -vis Medical Officer	
4		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	
5		*FM14.22	To give expert medical/ medico-legal evidence in Court of law	SGD – 2 hrs (Moot court)
6		*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	
7		FM1.7	Describe Dying Declaration & Dying Deposition	SGD – 1 hr (Role play)
8		*FM14.20	To record and certify dying declaration in a simulated/ supervised environment	
9		FM1.8	Describe the latest decisions/ notifications/ resolutions/circulars/ standing orders related to medico-legal practice issued by Courts/ Government authorities etc.	Lecture – 1 hr

10		*FM2.30	Have knowledge/awareness of latest decisions/ notifications/ resolutions/ circulars/standing orders related to medico-legal practice issued by Courts/ Government authorities etc	
11		FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially • maintenance of patient case records, discharge summary, • prescribed registers to be maintained in Health Centres. • maintenance of medico-legal register like accident register. • documents of issuance of wound certificate • documents of issuance of drunkenness certificate. • documents of issuance of sickness and fitness certificate. • documents for issuance of death certificate. • documents of Medical Certification of Cause of Death - Form Number 4 & 4A • documents for estimation of age by physical, dental and radiological examination and issuance of certificate	Lecture – 1 hr
12		FM1.10	Interpret appropriate cause of death in a particular scenario by referring ICD 10 code	SGD – 1 hr (Practical)
13		FM1.11	Draft a correct cause of death certificate as per ICD 10 document	
14	Forensic Pathology	FM2.20	Mechanical asphyxia: Define, classify and describe asphyxia and medico-legal interpretation of post-mortem findings in asphyxial deaths	SGD – 5 hrs
15		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	
16		FM2.22	Mechanical asphyxia: Describe and discuss patho-physiology, clinical features, postmortem findings and medico-legal aspects of traumatic asphyxia, obstruction of nose & mouth, suffocation and sexual asphyxia	

17		FM2.23	Describe and discuss types, pathophysiology, clinical features, postmortem findings and medico-legal aspects of drownings, diatom test and, gettler test.	
18		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)	SGD – 1 hr
19		FM2.25	Describe types of injuries, clinical features, pathophysiology, postmortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations	SGD – 1 hr
20		FM2.26	Describe and discuss clinical features, post-mortem findings and medico-legal aspects of death due to starvation and neglect	Lecture – 1 hr
21		FM2.27	Define and discuss infanticide, foeticide and stillbirth	SGD – 3 hrs
22		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	
23		FM14.13	To interpret the age of foetus by post-mortem examination	

24	Clinical Forensic Medicine	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	SGD – 4 hrs
25		FM3.4	Mechanical injuries and wounds: Define injury, assault & hurt. Describe IPC pertaining to injuries	Lecture – 2 hrs
26		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	SGD – 3 hrs
27		FM3.6	Mechanical injuries and wounds: Describe healing of injury and fracture of bones with its medico-legal importance	
28		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	
29		FM3.8	Mechanical injuries and wounds: Describe and discuss different types of weapons including dangerous weapons and their examination	
30		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	
31		FM3.10	Firearm injuries: Describe & 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	

32		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	SGD – 4 hrs
33		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	
34		*FM14.1	Examine and prepare Medico-legal report of an injured person with different etiologies in a simulated/ supervised environment	SGD – 2 hrs (Practical)
35		*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	SGD – 1hr (Practical)
36		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	Lecture – 2 hrs
37		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	
38		FM3.20	Discuss disputed paternity and maternity	
39		FM3.22	Define and discuss impotence, sterility, frigidity, sexual dysfunction, premature ejaculation. Discuss the causes of impotence and sterility in male and female	Lecture – 2 hrs
40		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	
41		FM3.26	Discuss the national Guidelines for accreditation, supervision & regulation of ART Clinics in India	
42		FM3.21	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC&PNDT) - Prohibition of Sex Selection Act 2003 and Domestic Violence Act 2005	SDL – 1 hr

43		FM3.24	Discuss the relative importance of surgical methods of contraception (vasectomy and tubectomy) as methods of contraception in the National Family Planning Programme	
44		FM3.25	Discuss the major results of the National Family Health Survey (This competency will be taught and assessed by Dept of Community Medicine)	
45		FM3.13	Describe different types of sexual offences. Describe various sections of IPC regarding rape including definition of rape (Section 375 IPC), Punishment for Rape (Section 376 IPC) and recent amendments notified till date	Lecture – 1 hr
46		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 dispatch of trace evidences in such cases	Lecture – 1 hr
47		FM3.15	SEXUAL OFFENCES Describe and discuss examination of accused and victim of sodomy, preparation of report, framing of opinion, preservation and dispatch of trace evidences in such cases	SGD – 3 hrs
48		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 dispatch of trace evidences in such cases	
49		FM3.17	Describe and discuss the sexual perversions fetishism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia	
50		*FM14.15	To examine & prepare medico-legal report of a victim of sexual offence/unnatural sexual offence in a simulated/ supervised environment	SGD – 1 hr (Practical)
51		*FM14.14	To examine & prepare report of an alleged accused in rape/ unnatural sexual offence in a simulated/ supervised environment	SGD – 1 hr (Practical)

52		FM3.27	Define, classify and discuss abortion, methods of procuring MTP and criminal abortion and complication of abortion. MTP Act 1971	Lecture – 2 hrs
53		FM3.28	Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	
54		FM3.29	Describe and discuss child abuse and battered baby syndrome	Lecture – 1 hr
55		FM3.30	Describe and discuss issues relating to torture, identification of injuries caused by torture and its sequelae, management of torture survivors	SDL – 1 hr
56		FM3.31	Torture and Human rights Describe and discuss guidelines and Protocols of National Human Rights Commission regarding torture	
57	Medical Jurisprudence (Medical Law and ethics)	FM3.32	Demonstrate the professionalism while preparing reports in medico-legal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	SGD – 2 hrs
58		FM3.33	Should be able to demonstrate the professionalism while dealing with victims of torture and human right violations, sexual assaults psychological consultation, rehabilitation	
59		*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	
60		FM4.1	Describe Medical Ethics and explain its historical emergence	Lecture – 3 hrs
61		FM4.2	Describe the Code of Medical Ethics 2002 conduct, Etiquette and Ethics in medical practice and unethical practices & the dichotomy	
62		FM4.3	Describe the functions and role of Medical Council of India and State Medical Councils	
63		FM4.4	Describe the Indian Medical Register	
64		FM4.5	Rights/privileges of a medical practitioner, penal erasure, infamous conduct, disciplinary Committee, disciplinary procedures, warning notice and penal erasure	

65		FM4.6	Describe the Laws in Relation to medical practice and the duties of a medical practitioner towards patients and society	
66		FM4.7	Describe and discuss the ethics related to HIV patients	
67		FM4.12	Discuss legal and ethical issues in relation to stem cell research	Lecture – 1 hr
68		FM4.13	Describe social aspects of Medico-legal cases with respect to victims of assault, rape, attempted suicide, homicide, domestic violence, dowry-related cases	
69		FM4.8	Describe the Consumer Protection Act-1986 (Medical Indemnity Insurance, Civil Litigations and Compensations), Workman's Compensation Act & ESI Act	Lecture – 1 hr
70		FM4.9	Describe the medico - legal issues in relation to family violence, violation of human rights, NHRC and doctors	
71		FM4.10	Describe communication between doctors, public and media	
72		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	SGD – 1 hr
73		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	
74		FM4.16	Describe and discuss Bioethics	
75		FM4.17	Describe and discuss ethical Principles: Respect for autonomy, non-maleficence, beneficence & justice	Lecture – 1 hr
76		FM4.11	Describe and discuss euthanasia	
77		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	
78		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	SGD – 3 hrs

79		FM4.20	Describe therapeutic privilege, Malingering, Therapeutic Misadventure, Professional Secrecy, Human Experimentation	Lecture – 1 hr
80		FM4.21	Describe Products liability and Medical Indemnity Insurance	
81		FM4.24	Enumerate rights, privileges and duties of a Registered Medical Practitioner. Discuss doctor-patient relationship: professional secrecy and privileged communication	
82		FM4.22	Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath	Lecture – 1 hr
83		FM4.23	Describe the modified Declaration of Geneva and its relevance	
84		FM4.25	Clinical research & Ethics Discuss human experimentation including clinical trials	
85		FM4.26	Discuss the constitution and functions of ethical committees	
86		FM4.27	Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	
87		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 (This competency will be taught and assessed by UBEC)	SGD – 1hr
88		FM4.29	Demonstrate ability to communicate appropriately with media, public and doctors	
89		FM4.30	Demonstrate ability to conduct research in pursuance to guidelines or research ethics (This competency will be taught and assessed by Dept of R&D)	
90	Forensic Psychiatry	FM5.1	Classify common mental illnesses including post-traumatic stress disorder (PTSD)	Lecture – 1 hr
91		FM5.2	Define, classify and describe delusions, hallucinations, illusion, lucid interval and obsessions with exemplification	
92		FM5.3	Describe Civil and criminal responsibilities of a mentally ill person	Lecture – 1 hr
93		FM5.4	Differentiate between true insanity from feigned insanity	
94		FM5.5	Describe & discuss Delirium tremens	

95		FM5.6	Describe the Indian Mental Health Act, 1987 & Indian Mental Healthcare Act 2017 with special reference to admission, care and discharge of a mentally ill person	SDL – 1 hr
96		FM6.1	Describe different types of specimen and tissues to be collected both in the living and dead:	Lecture – 1 hr
	Forensic Laboratory investigation in medical legal practice		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	
97		FM6.2	Describe the methods of sample collection, preservation, labeling, dispatch, and interpretation of reports	
98		FM6.3	Demonstrate professionalism while sending biological or trace evidences to Forensic Science lab, specifying the required tests to be carried out, objectives of preservation of evidences sent for examination, personal discussions on interpretation of findings	SGD – 1 hr
99		*FM14.21	To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.	
100	Emerging technologies in Forensic Medicine	FM7.1	Enumerate the indications and describe the principles and appropriate use for: - DNAprofiling - Facialreconstruction - Polygraph (LieDetector) - Narcoanalysis, - BrainMapping, - Digitalautopsy, - VirtualAutopsy, - Imagingtechnologies	SDL – 1 hr

101	Skills in Forensic Medicine & Toxicology	FM14.4	Conduct and prepare report of estimation of age of a person for medico- legal and other purposes & prepare medico-legal report in a simulated/ supervised environment	SGD – 2 hrs (Practical)
102		FM14.5	Conduct & prepare post-mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment	10 cases SGD – 2 hrs (Practical)
103		FM14.11	To identify & describe weapons of medicolegal importance which are commonly used e.g. lathi, knife, axe, Iron rod, dagger, razor, Glass piece, Scissors, Chopper, Hockey stick, Bansdola sticks etc., 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)	
104		FM14.12	Describe the contents and structure of bullet and cartridges used & to provide medico-legal interpretation from these	
105		FM14.16	To examine & prepare medico-legal report of drunk person in a simulated/ supervised environment	SGD – 1 hr (Practical)
106		FM14.19	To identify & prepare medico-legal inference from bone fracture, soot particles, diatoms & wound healing (slides)	SGD – 1 hr (Practical)

Lecture – 25 hours; SGD (small group discussion) – 45 hours (Practical classes marked ingreen); SDL (self-directed learning) – 5 hours (Marked in yellow)

Competencies in Internship

Certifiable Procedural skills desirable of Indian Medical Graduate in Forensic Medicine & Toxicology

- Documentation and certification of trauma(I)
- Diagnosis and certification of death (D)
- Legal documentation related to emergency cases(D)
- Certification of medico-legal cases e.g. Age estimation, Sexual Violence etc.(D)
- Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc (D)

I- Independently performed onpatients,

O- Observed in patients or on simulations,

D- Demonstration on patients or simulations and performance under supervision in patients
Compulsory rotating Internship posting of 7 days in Forensic Medicine and Toxicology
(current casualty postings of 15 days to be divided into 7 days of casualty and 7 days of Forensic Medicine)

Log book to be maintained.

The internship posting has to be extended (repeated) till all the certifiable skills are achieved. Use of skill lab is desirable wherever available

Competency	Number of times to be done	Assessment	Setting
IMG should independently examine a trauma patient / simulated patient and document and certify trauma	02	Skill assessment	Casualty / EMD
IMG should demonstrate on patients or simulations and performance under supervision in patients the diagnosis and certification of death	02	Skill assessment / DOAP Session	Casualty / EMD / Ward / ICU
IMG should demonstrate the legal documentation related to emergency care in a medicolegal register / accident register maintained at casualty / EMD	02	Skill assessment / DOAP Session	Casualty / EMD
IMG should examine, document and certify in a medicolegal case of age estimation	01	Skill assessment / DOAP Session	Forensic Medicine /Casualty / EMD
IMG should examine, document and certify in a medicolegal case of victim of Sexual violence	01	Skill assessment / DOAP Session	OBG/Forensic Medicine /Casualty / EMD
IMG should examine, document and certify in a medicolegal case of accused of Sexual violence	01	Skill assessment / DOAP Session	Forensic Medicine /Casualty / EMD
IMG should demonstrate communication in medicolegal cases with police	01	Skill assessment / DOAP Session	Forensic Medicine /Casualty / EMD
IMG should demonstrate communication in medicolegal cases with public health authorities	01	Skill assessment / DOAP Session	Forensic Medicine /Casualty / EMD
IMG should demonstrate communication in medicolegal cases with Radiology / Pathology / Microbiology / FSL departments	01	Skill assessment / DOAP Session	Forensic Medicine /Casualty / EMD

Assessment in Forensic Medicine & Toxicology

Summative Assessment - An assessment conducted at the end of instruction to check how much the student has learnt.

Formative Assessment - An assessment conducted during the instruction with primary purpose of providing feedback for improving learning.

Internal Assessment - Range of assessments conducted by the teachers teaching a particular subject with the purpose of knowing what is learnt and how it is learnt. Internal assessment can have both formative and summative functions.

Note - Assessment requires specification of measurable and observable entities. This could be in the form of whole tasks that contribute to one or more competencies or assessment of a competency per se. Another approach is to break down the individual competency into learning objectives related to the domains of knowledge, skills, attitudes, communication etc. and then assess them individually.

Scheduling of Internal Assessment

- In Phase II MBBS there will be two Internal assessments in theory and practical.
- In Phase III part 1 MBBS there will be two Internal assessments in theory and practical. One of the test should be prelim or pre-university examination

Theory IA can include:

Theory tests, seminars, quizzes, interest in subject, scientific attitude etc. Written tests should have essay questions, short notes and creative writing experiences.

Practical IA can include: practical tests, Objective Structured Practical Examination (OSPE), Directly Observed Procedural Skills (DOPS), records maintenance and attitudinal assessment.

Assessment of Log-book-

Logbook should record all activities like seminar, symposia, quizzes and other academic activities. It should be assessed regularly and submitted to the department. Up to twenty per cent IA Theory marks should be for Log book assessment.

Assessment of Practical Record book-Practical books should record all skills and other practical exercises done during the academic programme. It should be assessed regularly and submitted to the department. Up to twenty per cent IA Practical marks should be for Log book assessment

Internal Assessment for AETCOM will include: - Written tests comprising of short notes and creative writing experiences.

OSCE based clinical scenarios and/or viva voce. Skill competencies acquired during the Professional Development Programme (AETCOM) must be tested during the practical and viva voce.

Feed back in Internal Assessment-

Feed back should be provided to students through out the courses othat they are aware of their performance and remedial action can be initiated well in time. The feedbacks need to be structured and the faculty and students must be sensitized to giving and receiving feedback.

The results of IA should be displayed on notice board within two weeks of the test and an opportunity provided to the students to discuss the results and get feedback on making their performance better.

It is also recommended that students should sign with date whenever they are shown IA records in token of having seen and discussed the marks.

Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Internal assessment should be based on competencies and skills.

Criteria for appearing in University examination: Learners must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination

Internal assessment

Table Showing Scheme for Calculation of Internal Examination Marks

Theory (Maximum marks)		Practical (Maximum marks)	
Theory	80	Practical exercises	50
		Viva -Voce	20
		Practical record book+log book	10+10
Part completion tests	20	Level of participation in AETCOMactivities	05
		Professionalism	05
TOTAL	100	TOTAL	100

Average marks of all four notified theory internal assessment examinations (IAE) will be reduced to 80. Average marks obtained from Periodic Assessment Tests (Marks 20) will be added to IAE. The sum of IAE and PAT for 100 marks will be sent to the University. Average marks of the four practical IAE including viva-voce will be calculated for 70. The marks obtained for Logbook (10 marks), Record Book (10 marks), Professionalism (05 marks) and AETCOM (05 marks) will be added to practical IAE marks and the marks obtained for 100 will be sent to University.

- Internal assessment should be based on competencies andskills.
- Regular periodic examinations shall be conducted throughout the course. There shall be four internal assessment examinations in eachsemester

- An average of the marks scored in the four internal assessment examinations will be considered as the final internal assessment marks.
- At least 50% marks of the total marks combined in theory and practicals/clinical assigned for internal assessment is to be obtained in a particular subject to be eligible to appear for university examinations. A candidate who has not secured requisite aggregate in the internal assessment may be permitted to appear for another internal examination as a remedial measure. If he/she successfully completes the remediation measures prescribed by the Institution / University as the case may be, only then he/she is eligible to appear for University Examination.
- Students must secure at least 50% marks of the total marks (combined in theory and practical) assigned for internal assessment to be declared
- successful at the final university examination of that subject.
- The fourth internal examination is the preliminary examination to be conducted on the lines of the university examination.
- The students should be made aware of the results of internal assessment.
- Internal assessment marks will reflect as a separate head of passing at the university examination.
- The internal examination marks for the 1st, 2nd, 3rd and 4th internal examinations shall be submitted to the University on or before dates mentioned in University calendar.
- Professionalism (punctuality, respect for teachers, communication with peers, timely completion and submission of record books and level of preparedness for classes) must be assessed and form a component of the marks given for internal assessment as shown in the table above.
- A suggested format for assessing professionalism is shown in APPENDIX
- A proportion of marks from part completion tests must be added to the internal assessment marks as shown in the table above.
- Practical records must be assessed and contribute to the internal assessment marks as shown in the table above.
- Level of participation in AETCOM Activities must be assessed and contribute to the practical component as shown in the table above.
- The scheme for calculation of the internal examination marks is given in the table above.
- A clear record of all components that add to the internal assessment marks needs to be maintained by the institution and retained by them for at least 5 years after completion of the examination. Institutions may be asked to provide these details by the University as and when required.
- The internal and formative assessments provide ideal opportunities for students and teachers to identify learning gaps. Teachers should provide high quality feedback to each student to enable them to bridge these learning gaps.
- Formative assessments also enable the early identification of students who are struggling to achieve the intended learning outcomes. Early and appropriate targeted remediation must be planned for such students.
- Internal assessment marks (theory/practicals) will contribute for the eligibility criteria for university exam. However, it will not contribute for the pass criteria in university exam. Internal assessment marks will reflect under separate head in the marks card of the university examination.

Annexure

Teaching Learning Methods

- Didactic lectures should be made more interactive by encouraging the more involvement of the students. In the present digital era, student's involvement is more with usage of technology. For examples, many polling sessions, quizzes etc can be done using google slides and other apps like Kahoot, Socrative, menti.com etc.
- Small group discussion (SGD) should be planned properly and discussed among the faculty members before taking the class. As far as possible, uniformity should be maintained in the SGD by various facilitators. Case based learning (CBL) and problem based learning (PBL) may be used to make the learner understand and learn about the various aspects in order to achieve the particular competency.
- Encourage the students learn themselves through self-directed learning (SDL). SDL sessions may be planned with objectives in order to cover the particular competency. These sessions may be conducted by providing learning material (research articles, public news, videos, etc) by a teacher and ask the students to search on a particular topic. Students should learn themselves by going through available resources and come back to classes allotted for SDL sessions where teacher able to connect the learning of students in order to achieve the competency.
- Integrated classes should be planned in order to cover the competency involving the topics from different subjects. These classes can be taken using Nesting, Temporal Coordination or Sharing. Case linkers may be used to link the topic/subject area among different subjects/ departments.
- Skills should be taught using the clinical cases at hospital wards/casualty/EMD, simulation in skills labs and / or departmental demonstration rooms. Case scenarios may be developed while teaching at skills lab and/or demonstrate on rooms.

Example for teaching the clinical examination in poisoning:

- Case scenario: A farmer working in a field was brought with history of breathlessness, vomiting, excessive sweating and muscle twitching. On examination, the pupils were constricted and heart rate was decreased. He had defecated in his cloths. Smell of kerosene was present in his breath. Even the cloths were soiled smelling kerosene.
- Demonstration of clinical examination: Mannequins or standardized patients in the skills lab may be used for examination and recording of vital parameters like pulse, BP, RR, SPO2 and state of pupils.
- Diagnosis and management: Discuss the differential diagnosis, investigations and definitive diagnosis. Discuss the various treatment modalities. The response to drugs used for treatment can be demonstrated using high fidelity mannequins.

- Medico legal responsibilities: The medico legal responsibilities such as preservation of gastric lavage material, medico legal documentation, and police intimation should be demonstrated in a simulated environment and using standard formats.

Example for teaching the topic Injuries/ Trauma with integration:

- **Linker Case:** A 30-year-old male while travelling in a motor bike met with an accident with a car coming from opposite side. As a result of this, he sustained multiple injuries (can be displayed in the form of photographs). He was brought by his friend to the hospital. On reaching the hospital, patient was in semiconscious state with difficulty in breathing.
- **Subjects for integration:** Forensic Medicine, General Surgery.
 - Forensic Medicine: Topics covered in this subject include different types of mechanical injuries possible in such accidents and other relevant topics related to mechanical injuries. [Competencies to be covered: FM 3.3, 3.4, 3.8]
 - General Surgery: First aid treatment, Basic life support, Transportation of patient, basic management of injuries at hospital. [Competencies to be covered: SU 17.1, 17.2, 17.3]
- **Type of Integration:**
 - Horizontal: Temporal coordination can be done if it is done in the same phase.
 - Vertical: Nesting can be used if it is done in two different phases.
- **Additional details to case scenario:**
 - In addition to linker case, case details need to be added by respective departments depending on the progression of the class (such as clinical features, internal injuries, postmortem findings etc).
 - Case details may be introduced step by step in order to involve student's discussion.

Example for teaching the topic Drugs / Substances of abuse with integration:

Linker Case: A 15-year-old student was brought by his parents to the hospital with a history of addiction to drugs and behavioral changes since 6 months. On examination, the patient was anxious, restless and was hesitant to talk.

Subjects for integration: Pharmacology, Forensic Medicine, Psychiatry.

- Pharmacology: Topics covered in this subject include Definitions, List of drugs of abuse, Mechanism of drug addiction. [Competencies to be covered: PH 1.22, 1.23]
- Forensic Medicine: Description of features and management of drugs/substances of abuse. [Competencies to be covered: FM 12.1]
- Psychiatry: Etiology, clinical features, treatment of drugs/substances of abuse. [Competencies to be covered: PS 4.1, 4.2, 4.3, 4.4, 4.6, 4.7]

Type of Integration:

- Horizontal: Temporal coordination/ Sharing can be done if is done in the same phase.
- Vertical: Nesting can be used if it is done in two different phases.

Additional details to case scenario:

- In addition to linker case, case details need to be added by respective departments depending on the progression of the class (such as clinical features, behavioral changes, complications, legal problems etc.)
- Case details may be introduced step by step in order to involve students in discussion.

Annexure**Blue Print & Assessment methods - Theory Number of QPs for the subject: One Theory marks 100****Theory Question Paper: Blue print**

This shows the weightage given to each chapter in the summative assessment. This improves the content validity by distributing the assessment of learners in the competencies that are represented by learning objectives under each chapter.

Number of QPs for the subject: One.

Only CORE competencies shall be considered for framing questions. Each paper should contain the following distribution of questions (as shown in below table).

Type of questions	Marks per question	Number of questions	Total marks
MCQs	1	20	20
Long Essay questions	10	2	20
Short essay questions	5	6	30
Short answer questions	3	10	30

One Long Essay question and One Short Essay question should be of Problem solving or on Clinical application. 35% questions should be of the higher order thinking

This shows the weightage given to each topic in the summative assessment. This improves the content validity by distributing the assessment of learners in the competencies that are represented by learning objectives under each topic.

Distribution of marks in suggested blue print:

Section	Chapters & Competencies	Marks allotted	Number of questions		
			Long essay	Short essay	Short answer
Section 1	General information [Competencies 1.7 to 1.10]	3			1
Section 2	Forensic Pathology [Competencies 2.1 to 2.28]	23*	1	2	1
Section 3	Clinical Forensic Medicine [Competencies 3.1 to 3.23, 3.26 to 3.30]	24*		3	3
Section 4	Medical Jurisprudence [Competencies 4.1 to 4.8, 4.10 to 4.24, 4.26]	21 [#]		3	2
Section 5	Forensic Psychiatry, [Competencies 5.1 to 5.5, 6.1 to 6.2]	5		1	
Section 6	Forensic Laboratory Investigation in medico-legal practice [Competencies 6.1 to 6.2]	3			1
Section 7	Toxicology [Competencies 8.1 to 8.10, 9.1 to 9.6, 10.1, 11.1, 12.1, 13.1 to 13.2]	21 [#]	1	1	2
	Total number of questions	100	2	10	10

The above table shows the distribution of marks according to different sections.

- The questions should be framed only from Core competencies (as shown in abovetable).
- Each paper should contain Long essay (10 marks x 2), Short essay (5 marks x 10), Short answer (3 marks x10).
- *One long essay question should be from Section 2 or 3. If Section 2 contain 1 long essay, 2 short essay and 1 short answer questions, the Section 3 should contain 3 short essay and 3 short answer questions and viceversa.
- #TheotherlongessayquestionshouldbefromSection4or7. IfSection7contain 1longessay,1shortessayand2shortanswer questions, the Section 4 should contain 3 short essay and 2 short answer questions and viceversa

Question paper layout to show which question number will represent which chapter(s).

MCQs: 80% of MCQs from Forensic Medicine and 20%from Toxicology 1x20 marks = 20

Long Essay: 2 x 10 marks = 20

1	Forensic Pathology (section 2) OR Clinical Forensic Medicine (section 3)
2	Medical jurisprudence (section 4) OR Toxicology (section 7)

Short Essays:**6 x 5 marks = 30**

3	Section 2
4	Section 3
5	Section 4
6	Section 5
7	Section 2 or Section 3
8	Section 7

Short Answers:**10 x 3 marks = 30**

9	Section 1
10	Section 2
11	Section 3
12	Section 2 or Section 3
13	Section 2 or Section 3
14	Section 4
15	Section 4
16	Section 7
17	Section 7
18	Section 6

Annexure

Blue Print & Assessment methods - Practical
Practical 80
Viva Voce 20

Practical Question Paper: Blue print**OSPE in FMT:**

Station	Exercise	Marks	Duration
Station-1	Wound certificate	10	30 min
	Weapon examination	5	
Station-2	Age certificate	15	30 min
Station-3	Skeletal remains	10	20 min
Station-4 (Any one exercise)	Victim of rape	10	20 min
	Accused of rape		
	Drunkenness certificate		
Station-5	PM certificate	10	20 min
Station-6	Spotters	10	10 min
Station-7	Blood grouping	5	10 min
Station-8 (Any one exercise)	Preservation of evidentiary materials in poisoning	5	10 min
	Preservation of DNA material for analysis		
	Gestational age of fetus		
	MCCD		

Detailed planning of practical assessment:

<i>Station</i>	<i>Exercise</i>	<i>Assessment</i>	<i>Marks</i>	<i>Duration</i>
Station-1	Wound certification	Option-A: - A case scenario containing the details of a patient, history and part-task trainer with injuries will be given. - Student will be asked to draft a certificate as per the format based on above case details. Evaluation will be based on the checklist. Option-B: - A case scenario containing the details of a patient, history, multiple photographs of injuries with scale attached (printed in a single page) will be given. - Student will be asked to draft a certificate as per the format based on above case details. - Evaluation will be based on the checklist.	10	30 min
	Weapon examination	- A weapon related to above wound certificate will be given. - Student will be asked to examine and draft a report as per the format. - Evaluation will be based on the checklist.	5	
Station-2	Age certificate	- A case scenario containing the details of a patient, history, findings of General Physical Examination, Tooth eruption (picture of dentition) and X-ray film/s will be given. - Student will be asked to draft a certificate as per the format based on above case details. - Evaluation will be based on the checklist.	15	30 min
Station-3	Skeletal remains	- A case scenario containing the history and relevant findings of scene from where the bone/s were recovered will be given. - Student will be asked to examine the bone/s and draft a report as per the format. - Evaluation will be based on the checklist.	10	20 min

Station-4 (Any one exercise)	Victim of rape	- A case scenario containing the details of a patient, history and findings related to sexual violence (victim of rape) will be given. - Student will be asked to draft a report in a printed modified format (as shown in annexure) based on case details and answer questions related to case scenario. - Evaluation will be based on the checklist.	10	20 min
	Accused of rape	A case scenario containing the details of a patient, history and findings related to sexual violence (accused of rape) will be given.		
		- Student will be asked to draft a report in a printed modified format (as shown in annexure) based on case details and answer questions related to case scenario. - Evaluation will be based on the checklist.		
	Drunkness certificate	- A case scenario containing the details of a patient, history and findings related to drunkenness will be given. - Student will be asked to draft a report as per the format based on case details and answer questions related to case scenario. - Evaluation will be based on the checklist.		
Station-5	PM certificate	- A case scenario containing the details of a patient, history and postmortem findings will be given. - Student will be asked to draft the PM certificate and give opinion on cause of death, time since death and any other questions related to case scenario. - Evaluation will be based on the checklist.	10	20 min
Station-6 (Spotter)	Hair, Semen, & other Biological fluids; Blood - Identification of species;	- It should contain 10 spotter. - Each spotter will be awarded maximum of one mark for correct responses. - Each spotter should be completed by 2 minutes duration.	10	10 min

	Photographs / Specimens; Poisons; Histopathology Slides; Firearm cartridge	- Ideally spotters should contain applied type of questions related to content of the spotter. - Evaluation will be based on the marks allotted to structured questions.		
Station-7	Blood grouping	- A case scenario containing the details of a patient, history and relevant findings related to blood grouping will be given. - Student will be asked to determine the blood group of a given sample. - Evaluation will be based on the checklist.	5	10 min
Station-8 (Any one exercise)	Preservation of evidentiary materials in poisoning	- A case scenario containing the details of a patient, history and clinical features of any poisoning will be given. - Student will be asked to list the various evidentiary materials to be preserved in such cases, write the labels for such preservation, and write the letters to FSL for analysis. - Evaluation will be based on the checklist.	5	10 min
	DNA material	A case scenario containing the details of a patient, history and relevant findings related to DNA analysis will be given.		
		- Student will be asked to list the various evidentiary materials to be preserved in such cases, write the labels for such preservation, and write the letters to FSL for analysis. - Evaluation will be based on the checklist.		
	Gestational age of fetus	- A case scenario containing the details of a patient, history and findings related to gestational age will be given. - Student will be asked to determine the gestational age and answer the questions related to case scenario. - Evaluation will be based on the checklist.		
	MCCD	- A case scenario containing the details of a patient, history and clinical findings related to MCCD will be given. - Student will be asked to draft a certificate as per the format based on above case details. - Evaluation will be based on the checklist.		

Annexure

Checklists

Checklist for Practical Assessment:

Wound certificate

(Maximum marks:10)

Component of certificate	Max marks	Marks awarded
Preliminary details (MLC No., Name, Age, Sex, Address, Date of admission & discharge, Brought by)	0.5	
Consent	1	
Identification marks	1	
History	1	
Details of injuries	4	
Opinion	2	
Signature, Name & Designation of doctor	0.5	
Total	10	

Weapon examination

(Maximum marks:5)

Component of certificate	Max marks	Marks awarded
Addressing to IO, Subject, Reference	0.5	
Details of receiving weapon from police and date and time of examination	0.5	
Name & Type of weapon; Weight of weapon	1	
Description & dimensions of weapon	1.5	
Opinion	1	
Signature, Name & Designation of doctor	0.5	
Total	5	

Age certificate

(Maximum marks :15)

Task	Max marks	Marks awarded
Details on receiving request letter	0.5	
Preliminary details (MLC No., Name, Age, Sex, Address, Date, time & place of examination)	1	
Consent	1	
Identification marks	1	
History	1	
General physical examination with inference	2	
Dental examination with inference	3	
Radiological examination with inference	3	
Final opinion on age	2	
Signature, Name & Designation of doctor	0.5	
Total	15	

Skeletalre mains**(Maximum marks :10)**

Component of certificate	Max marks	Marks awarded
Addressing to IO, Subject, Reference	0.5	
Details of receiving Skeletal remains from police and date and time of examination	1	
Whether it is bone / not?	0.5	
Number of bones/dismembered body parts		
Physical state of bones/dismembered body	0.5	
Belongs to human/animal		
Morphological details	4	
Belongs to one or more individuals	0.5	
Injuries / manner of separation		
Cause of death	0.5	
Time since death		
Opinion	2	
Signature, Name & Designation of doctor	0.5	
Total	10	

Examination of Victim of sexualviolence**(Maximum marks:10)**

Task	Max marks	Marks awarded
Preliminary details (as printed from No. 1 to 11 in the format given)	0.5	
Consent	1	
Identification marks	0.5	
Relevant medical/surgical history	0.5	
History related to sexual violence	0.5	
General physical examination	0.5	
Examination for injuries on body	0.5	
Local examination of genital parts/other orifices	1	
Sample collection/ investigations for hospital laboratory/ Clinical laboratory	1	
Samples Collection for FSL	1	
Date and time of completion of examination	0.5	
Investigation (hospital laboratory/FSL) reports	0.5	
Opinion	2	
Total	10	

Examination of Accused of sexualviolence**(Maximum marks :10)**

Task	Max marks	Marks awarded
Preliminary details (as printed from No. 1 to 11 in the format given)	0.5	
Consent	1	
Identification marks	0.5	
Relevant medical/surgical history	0.5	
History related to sexual violence	0.5	
General physical examination	0.5	
Examination for injuries on body	0.5	

Local examination of genital parts/other orifices	1	
Sample collection/ investigations for hospital laboratory/ Clinical laboratory	1	
Samples Collection for FSL	1	
Hospital laboratory/FSL reports	0.5	
Opinion	2	
Signature, Name & Designation of doctor	0.5	
Total	10	

Drunkenness certificate

(Maximum marks :10)

Component of certificate	Max marks	Marks awarded
Preliminary details (OPD/IPD No., MLC No., Name, Age, Sex, Address, Date & time of examination, Brought by)	0.5	
Consent	1	
Identification marks	0.5	
History	1	
General examination	1	
Examination for muscular Co-ordination	1	
Injuries	1	
Systemic examination	0.5	
Collection of materials for analysis	1	
Opinion	2	
Signature, Name & Designation of doctor	0.5	
Total	10	

Preservation of evidentiary material in Poisoning

(Maximum marks :5)

Component of certificate	Max marks	Marks awarded
From and To address	0.5	
PM No., Name, Age, Sex, Crime/UDR No., PS	0.5	
List of evidentiary materials collected	2	
Signature, Name & Designation of doctor	0.5	
Labels for evidentiary materials	1.5	
Total	5	

Preservation of evidentiary material for DNA analysis

(Maximum marks:5)

Component of certificate	Max marks	Marks awarded
From and To address	0.5	
PM/MLC No., Name, Age, Sex, Crime/UDR No., PS	0.5	
List of evidentiary materials collected	2	
Signature, Name & Designation of doctor	0.5	
Labels for evidentiary materials	1.5	
Total	5	

Blood grouping**(Maximum marks:5)**

Component of certificate	Max marks	Marks awarded
From and To address	0.5	
PM/MLC No., Name, Age, Sex, Crime/UDR No., PS	0.5	
Test conducted	0.5	
Method used for testing	0.5	
Findings observed after testing	1.5	
Final opinion	1	
Signature, Name & Designation of doctor	0.5	
Total	5	

MCCD certification**(Maximum marks:5)**

Component of certificate	Max marks	Marks awarded
Preliminary details (Name of hospital, Date and time of death)	0.5	
Name, Age, Sex	0.5	
Cause of death (Immediate & Antecedent cause)	2	
Cause of death (Other contributing causes)	0.5	
Manner of death	0.5	
Death associated with pregnancy/ delivery	0.5	
Signature, Name & Designation of doctor	0.5	
Total	5	

PM certificate**(Maximum marks:10)**

Component of certificate	Max marks	Marks awarded
Drafting PM certificate + Opinion	3+2	
Question 1	1	
Question 2	1	
Question 3	1	
Question 4	1	
Question 5	1	
Total	10	

Annexure

Integration topics

Integration: The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine.

Integration of Forensic Medicine with Other departments:

The suggested topics, competencies and the subjects/departments for integrated teaching are shown in below table.

Sl. No.	Topic for integration	Subject [Competencies]
1	Injuries / Trauma	Forensic Medicine [FM 3.3, 3.4, 3.8, 3.9, 3.10] General Surgery [SU 17.1, 17.2, 17.3]
2	Wound healing	General Surgery [SU 5.1, 5.2, 5.3, 5.4] Pathology [PA 5.1] Forensic Medicine [FM 3.6]
3	Regional injuries	Forensic Medicine [FM 3.11, 3.12] General Surgery [SU 17.4, 17.5, 17.6, 17.7, 17.8, 17.9, 17.10]
4	Burns	Forensic Medicine [FM 2.24, 2.25] General Surgery [SU 4.1, 4.2, 4.3, 4.4]
5	Organ transplantation	General Surgery [SU 13.1, 13.2, 13.3, 13.4] Ophthalmology [OP 4.9, 4.10] Forensic Medicine [FM 2.4]
6	Pregnancy and labour	Forensic Medicine [FM 3.19, 3.20] OBG [OG 6.1, 7.1]
7	Abortion	Forensic Medicine [FM 3.27, 3.28] OBG [OG 1.3, 9.1, 9.2, 20.1, 20.2]
8	PCPNDT Act	OBG [OG 20.3] Radiodiagnosis [RD 1.13] Forensic Medicine [FM 3.21]
9	Impotence and Sterility	Forensic Medicine [FM 3.22, 3.23, 3.24, 3.25, 3.26] Pharmacology [PH 1.40] OBG [OG 28.1, 28.2, 28.3, 28.4]
10	Psychiatric disorders	Psychiatry [PS 3.7, 3.8] Forensic Medicine [FM 5.1, 5.2, 5.3, 5.4, 5.5, 5.6]
11	General toxicology	Forensic Medicine [FM 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8] Pharmacology [PH 1.4, 1.5, 1.11] General Medicine [IM 21.1, 21.5, 21.6, 21.7, 21.8]
12	Insecticides	Forensic Medicine [FM 8.6] Pharmacology [PH 1.52] Community Medicine [CM 3.8]
13	Corrosives	Forensic Medicine [FM 9.1] General Medicine [IM 21.3]
14	Heavy metal poisoning	Forensic Medicine [FM 9.2, 9.3] Pharmacology [PH 1.53]
15	Plant poisons	General Medicine [IM 21.2] Forensic Medicine [FM 10.1]
16	Snake, scorpion, insect bites	Forensic Medicine [FM 11.1] General Medicine [IM 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9]
17	Alcohol disorders	Pharmacology [PH 1.20, 1.21] Pathology [PA 12.1, 25.4] General Medicine [IM 5.5] Forensic Medicine [FM 9.4]
18	Drugs of abuse	Pharmacology [PH 1.22, 1.23] Forensic Medicine [FM 12.1] Psychiatry [PS 4.1, 4.2, 4.3, 4.4, 4.6, 4.7]

Sl no	Subject	Competency number	Competency	TL method	Assessment	Vertical Integration	Horizontal Integration
1	Anatomy	AN14.3	Describe the importance of ossification of lower end of femur & upper end of tibia	Lecture	Viva voce / Practicals	Forensic Medicine	-
2	Pharmacology	PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	Lecture / SGD	Written / Viva voce	Psychiatry	Forensic Medicine
3		PH5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs	SGD	Short note / viva voce	-	Forensic Medicine
4	Radiodiagnosis	RD1.13	Describe the components of the PC & PNDT act and its medicolegal implications	Lecture / SGD		OBG, Forensic Medicine	-
5	Psychiatry	PS19.3	Describe and discuss the basic legal and ethical issues in psychiatry	Lecture / SGD	Written / Viva voce	Forensic Medicine, AETCOM	-
6	General Medicine	IM20.1	Enumerate the poisonous snakes of your area and describe the distinguishing marks of each	Lecture / SGD	Written / Viva voce	Forensic Medicine, Pharmacology	
7		M20.2	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	DOAP session	Skill assessment / Written / Vivavoce	Forensic Medicine	
8		M20.3	Describe the initial approach to the stabilisation of the patient who presents with snake bite	Lecture / SGD	Written / Viva voce	Forensic Medicine	
9		M20.4	Elicit and document and present an appropriate history, the circumstance, time, kind of snake, evolution of symptoms in a patient with snake bite	Bedside clinic, DOAP session	Skill assessment	Forensic Medicine	

10		IM21.2	Enumerate the common plant poisons seen in your area and describe their toxicology, clinical features, prognosis and specific approach to detoxification	Lecture / SGD	Written / Viva voce	Forensic Medicine, Pharmacology
11		IM21.3	Enumerate the common corrosives used in your area and describe their toxicology, clinical features, prognosis and approach to therapy	Lecture / SGD	Written / Viva voce	Forensic Medicine, Pharmacology
12		IM21.4	Enumerate the commonly observed drug overdose in your area and describe their toxicology, clinical features, prognosis and approach to therapy	Lecture / SGD	Written / Viva voce	Forensic Medicine, Pharmacology
13		IM21.5	Observe and describe the functions and role of a poison centre in suspected poisoning	DOAP Session	Document in log book	Forensic Medicine, Pharmacology
14		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	Lecture / SGD / DOAP Session	Written / Viva voce / Skill assessment	Forensic Medicine, Pharmacology
15		IM21.7	Counsel family members of a patient with suspected poisoning about the clinical and medico legal aspects with empathy	DOAP Session	Skill assessment	Forensic Medicine, Pharmacology
16		IM21.8	Enumerate the indications for psychiatric consultation and describe the precautions to be taken in a patient with suspected suicidal ideation / gesture	DOAP Session	Skill assessment	Forensic Medicine, Psychiatry
17	OBG	OG1.3	Define and Discuss still birth and abortion	Lecture / SGD	Notes	Forensic Medicine
18		OG9.2	Describe the steps and observe/ assist in the performance of an MTP evacuation	DOAP Session,	Viva voce	Forensic Medicine

				Bedside clinic			
19		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	Lecture / SGD	Written / Viva voce	Forensic Medicine	
20		OG20.2	In a simulated environment administer informed consent to a person wishing to undergo medical termination of pregnancy	DOAP Session	Skill assessment	Forensic Medicine	
21		OG20.3	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC& PNDT) Act 1994 & its amendments	Lecture / SGD	Written / Viva voce	Forensic Medicine	
22		SU8.1	Describe the principles of Ethics as it pertains to surgery	Lecture / SGD	Written / Viva voce / Skill assessment	Forensic Medicine, AETCOM	
23	General Surgery	SU8.2	Demonstrate Professionalism and empathy to the patient undergoing surgery	Lecture / SGD / DOAP Session	Written / Viva voce / Skill assessment	Forensic Medicine, AETCOM	
24		SU8.3	Discuss Medico legal issues in surgical practice	Lecture / SGD	Written / Viva voce / Skill assessment	Forensic Medicine, AETCOM	

Annexure

Topics for Electives

- Disaster management
- Medicolegal aspects of healthcare / hospital administration
- Deposing evidence in a Court of Law
- Medicolegal aspects in management of emergency cases
- Forensic odontology
- Disaster victim identification
- Forensic anthropology
- Forensic psychiatry
- Forensic radiology
- Forensic toxicology
- Snake bite – species identification and management
- Crime scene examination
- Forensic ballistics

ELECTIVES IN FORENSIC MEDICINE AND TOXICOLOGY
Elective topic: FORENSIC ANTHROPOLOGY

Name of Block	Block 07
Name of Elective	Forensic Anthropology
Location of hospital lab or research facility	Department of Forensic Medicine and Toxicology, Forensic Anthropology section
Name of internal preceptor(s)	Teaching staffs at department of Forensic Medicine and Toxicology
Name of external preceptor (if any)	NA
Learning objectives of the elective	• Apply forensic anthropological knowledge and techniques to identify human skeletal remains. • Learn how to document, maintain chain of custody and reporting after examination of skeletal remains. • Apply forensic anthropological knowledge and techniques to differentiate human and faunal skeletal.
Number of students that can be accommodated in this elective	5
Prerequisites for the elective	• Demonstration room with LCD projector facilities • Various skeletal remains of human and animal • Anthropometric set • Charts / photographs of skeletal remains of human and animal
Learning resources for students	• Handbook of Forensic Anthropology / Printed notes on Forensic Anthropology • Handbook with objectives and detailed schedule of teaching learning activities of elective. • Case studies
List of activities in which the student will participate	• Participate in departmental academic activities • Observe , assist and learn skill of analyzing skeletal remains • Observe , assist and learn skill of dispatching evidences after analyzing skeletal remains and maintenance of chain of custody • Conduct individually the analysis of skeletal remains
Portfolio entries required	• Documentation & reflection on daily work done and observed cases • Details of presentation done and reflection on discussion during presentation
Log book entry required	• Documentation of work done on daily basis • List the normal values used for measurement in analysis of skeletal remains • Details of cases observed / assisted
Assessment	• Formative assessment in the form of case presentation & OSPE
Other comments	

Elective topic: CRIME SCENE EXAMINATION

Name of Block	Block 2
Name of Elective	Crime scene examination
Location	Practical laboratory/Museum/Simulated crime scene(indoor/outdoor)
Name of Internal preceptor(s)	Forensic Medicine & Toxicology staff
Name of External preceptor(if any)	NA
Learning objectives of the elective	➤ To document evidence and its orderly collection during crime sceneexamination. ➤ To prepare a neat labeled sketch of crimescene. ➤ Identify elements of a crime scene using technology based simulatedinvestigations. ➤ To interpret and analyze the crimescene.
Number of students that can be accommodated in this elective	4
Prerequisites for this elective	• Well-equipped practical laboratory/ Simulated crimescene • Barricadetape • Male/femalemannequin • Surgicalgloves • Measuring tape & steel taperoll • Hand lens • Digitalcamera • Clean containers (glass &plastic) • Polythene & paperenvelops • Cottonswabs • Glassslides • Glass markingpencils • Thermometer • Notebook, pen, markers,pencils • Disposable syringes, glass vials (EDTA & oxalate)
	• Stethoscope • Flashlight • Surgical knives with spare blades, forceps, scissors, bluntprobes
Learning resources for students	• Crime scene investigationactivity • Crime sceneprintable • Information pages, activity worksheets,review worksheets, and quizzes that focus on fingerprints , hair andDNA • Webadventures
List of activities in the student will participate	• Participate in departmental activity in relation to crimescene. • Observe, assist and learn skill of analyzingcrime sceneexamination • Prepare a neat labelled sketch of crime scene examination. • Periodic case presentation(crime sceneanalysis) • Collection, preservation, packing and dispatch of evidentiarymaterial.
Portfolio entries required	• Documentation and reflection on daily work done and observedcases • Details of presentation done and reflection on discussion duringpresentation
Log book entry required	• Documentation of work done on dailybasis
Assessment	• Formative assessment in the form of Case presentation and OSPE
Other comments	

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
SRI DEVARAJ URS MEDICAL COLLEGE
Tamaka, Kolar - 563103

M.B.B.S Degree Program
Community Medicine Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

COMMUNITY MEDICINE

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting hours	Practicals/SGT/Tutorials	Total
Community Medicine	20	60	30	110

The clinical postings (field Posting) in second professional shall be 15hours per week (3hours per day from Monday to Friday)

Community Medicine topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	NUTRITION
2.	EPIDEMIOLOGY
3.	ENVIRONMENTAL HEALTH PROBLEMS(PRACTICALS)
4.	NUTRITION (PRACTICALS)
5.	EPIDEMIOLOGY(PRACTICALS)
6.	DEMOGRAPHY & VITAL STATISTICS (PRACTICALS)
7.	REPRODUCTIVE MATERNAL & CHILD HEALTH (PRACTICALS)

Topics	Number	COMPETENCIES	Core	Suggested Teaching Learning method	Suggested Assessment
NUTRITION	CM5.1	(CM5.1)1 Describe the common sources of Macronutrients and Micronutrients. (CM5.1)2 Describe the role of Macronutrients and Micronutrients and discuss the management of diseases due to their deficiency. (CM5.1)3. Mention the daily requirement of Macronutrients and Micronutrients according to age, sex, activity, physiological conditions.	Y	Didactic lecture (1 hours)	Written & Viva voce
	CM5.3	(CM5.3)4. Define malnutrition. Classify PEM. Describe the etiology, clinical features and management of PEM. (CM5.3)5. Enumerate the common nutritional deficiency diseases in children. Describe in detail about Vit A deficiency. (CM5.3)6. Describe etiology, clinical features and prevention of Iodine deficiency disorders. (CM5.3)7. Describe etiology, clinical features and prevention of Iron Deficiency Anaemia	Y	Didactic lecture (1 hours)	Written & Viva voce
	CM5.5	(CM5.5)8. Describe the methods of nutritional surveillance. (CM5.5).9. Describe the methods of principles of nutritional education and rehabilitation. (CM5.5).10. Differentiate between growth monitoring & nutritional surveillance. (CM5.5).11. Discuss the role of socio cultural factors in nutritional status of the community.	Y	Didactic lecture (1 hours)	Written & Viva voce
	CM5.6	(CM5.6).12. Enumerate the salient features of National Nutrition Policy. (CM5.6). 13. Describe the National Nutritional programmes (CM5.6)14. Describe Integrated Child Development Scheme (ICDS)	Y	Didactic lecture (1 hours)	Written & Viva voce
	CM5.7 & CM5.8	(CM5.7) 15. Describe food hygiene (milk, meat). Enumerate food borne illnesses. (CM5.8) 16. Describe the importance of food fortification and enumerate methods of food fortification. (CM5.8) 17. Differentiate between supplementation and fortification. (CM5.8) 18. Define Food Adulteration. Enumerate common food adulterants and describe the effects of Food Adulteration. (CM5.8) 19. Describe in detail about Food Toxicants. (CM5.8) 20. Describe Prevention of Food Adulteration Act.	Y	Didactic lecture (2 hours)	Written & Viva voce

EPID EMIO LOGY	CM7.1	(CM7.1) 21. Define 'epidemiology' with amplification of the terms. (CM7.1) 21. List and describe with examples the various applications or uses of epidemiology.	Y	Didactic lecture (1 hour)	Written & Viva voce
	CM7.2	(CM7.2) 22. Define selected terms in Infectious disease epidemiology – Infection, contamination, infestation, host – primary, secondary, transport and obligate, infectious disease, contagious disease, communicable disease, epidemic, endemic, pandemic, sporadic, zoonosis, surveillance and eradication. (CM7.2) 23. Define a 'source' and 'reservoir' with respect to dynamics of disease transmission. (CM7.2) 24. Classify cases and define – primary case, index case, secondary case and suspect case. (CM7.2) 25. Classify and give examples for carriers with respect to type, duration and portal of exit. (CM7.2) 26. Classify different modes of communicable disease under direct and indirect ways and describe each of them with examples. (CM7.2) 27. Graphically represent the relationship between time and occurrence of cases and able to define different types of incubation periods. (CM7.2) 28. Define 'serial interval', 'SAR', and 'generation time'. (CM7.2) 29. Classify and describe with examples disease occurrence with respect to 'time', 'place' and 'person'. (CM7.2) 30. Describe the mechanism of host defences in terms of active, passive and herd immunity with examples. (CM7.2) 31. List the vaccines used under NIS. (CM7.2) 32. Able to classify the vaccines based on preparation. (CM7.2) 33. Classify AEFI with examples. (CM7.2) 34. Able to describe the steps to be adopted or investigate AEFI. (CM7.2) 35. List principles of vaccination including contraindications. (CM7.2) 36. Discuss the IHR with respect to vaccination. (CM7.2) 37. Differentiate between 'isolation' and 'quarantine'. (CM7.2) 38. Define various types of disinfection including the various modes available for the same. (CM7.2) 39. Define 'chronic disease'. (CM7.2) 40. Define and interpret 'Epidemiological transition ratio' with respect to India. (CM7.2) 41. Enlist and describe the	Y	Didactic lecture SLO- 22 TO 25 – 1 hour 26 to 29- 1 Hour 30 to 35 1hour 36 to 37 1hour 38 to 40 1 hour 41 to 44 1 hour	Written & Viva voce

	various risk factors for NCDs. (CM7.2) 42. Describe the gaps in natural history of disease with respect to NCDs. (CM7.2) 43. Enlist the various cost effective interventions that are used as preventive strategies in NCDs. (CM7.2) 44. List ten global targets adopted by India under WHO Global action plan for prevention and control of NCDs (2013-2020).			
CM7.3	(CM7.3) 45. Differentiate between 'data' and 'information' (CM7.3) 46. Enlist components of HMIS (CM7.3) 47. List the uses of health information. (CM7.3) 48. List and describe various sources of health information – census, SRS, Vital event registry, Disease notification, hospital records, morbidity and mortality registers, record linkage, surveillance, and other sources. (CM7.3) 49. Describe different types of surveys. (CM7.3) 50. Describe various ways of survey (methods of survey).	Y	Didactic lecture SLO 48,49&50- 1 hour	Written & Viva voce
CM7.5	(CM7.5) 51. Classify various epidemiological study designs including qualitative study designs. (CM7.5) 52. Describe steps in descriptive study. (CM7.5) 53. Describe steps in analytical study – case control, cohort and RCT. (CM7.5) 54. Define, Calculate and Interpret – incidence, odds ratio, relative risk, attributable risk and population attributable risk for a given data by applying 2 x 2 tables. (CM7.5) 55. Differentiate between case control and cohort studies. (CM7.5) 56. Discuss the Steps in conducting RCT. (CM7.5) 57. Describe various types of RCTs and Non-randomized trials. (CM7.5) 58. Explain the types of migration studies with examples and also about importance of these studies.	Y	Didactic lecture SLO 51&52 - 1 hour SLO 53,54 &55 - 2 hours SLO 56,57 &58 1 hour	Written & Viva voce
CM7.8	(CM7.8) 59. Differentiate between 'association' and 'causation'. (CM7.8) 60. Classify and explain the various types of association with examples. (CM7.8) 61. Describe Hill's criteria for causation with examples. (CM7.8) 62. List the various biases with respect to study designs with examples for each. (CM7.9) 63. Enumerate methods available to reduce the biases studied.	Y	Didactic lecture SLO 59, 60&61 - 1 hour SLO 62&63 1 hour	Written & Viva voce

Environment & Health	CM3.2	Describe concepts of safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting SLO (CM3.2) 6. Critically interpret water analysis report (CM3.2) 7. Demonstrate collection of water sample for microbiological analysis (CM3.2) 8. Demonstrate estimation of free chlorine. (CM3.2) 9. Demonstrate Horrock's test and interpret the results	Y	Small group discussion Problem solving 6 hours	Problem solving written OSPE
	CM3.7	Identify and describe the identifying features and life cycles of vectors of Public Health importance and their control measures SLO (CM3.7) 11. Identify various life stages of Anopheles, Culex and Aedes Mosquito. (CM3.7) 12. Identify the various agents used for vector control and mechanism of action.	Y	Small group discussion & Practicals 8 hours	OSPE
Nutrition	CM5.4	Plan and recommend a suitable diet for the individuals and families based on local availability of foods and economic status, etc in a simulated environment SLO (CM5.4) 15. Prepare a balanced diet for adult men, women, a pregnant woman and children.	Y	SGD Problem solving 4 hours	Problem solving written OSPE & OSCE
Epidemiology	CM7.4	Define, calculate and interpret morbidity and mortality indicators based on given set of data SLO (CM7.4) 18. Define, calculate and interpret morbidity and mortality indicators based on given set of data.	Y	Small group Discussion problem solving 2 hours	Problem solving written OSPE
	CM7.6	Enumerate and evaluate the need of screening tests (CM7.6) 19. Explain the concept of 'lead time' and 'lag time' in concept of screening with help of diagram. (CM7.6) 20. Application of various screening tests for a given scenario (CM7.6) 21. Define, calculate and interpret the various indicators of screening test for a given problem or scenario by constructing a 2 x 2 table and application of formulae.	Y	Small group discussion Problem solving 2 hours	Problem solving written OSPE
	CM7.7	(CM7.7) 22. Diagnosing the outbreak and suggesting the ways to investigate and report in a given case scenario.	Y	Small group discussion PBL 2 hours	Problem solving written OSPE

Demography and vital statistics	CM9.2	(CM9.2)28. Define and demonstrate calculation of various fertility related indicators and their interpretation	Y	Small group discussion, Problem solving 4 hours	Problem solving written OSPE
Reproductive maternal and child health	CM10.6	(CM10.6)29. Identify the various Family Planning methods and ability to suggest their use in a given scenario. (CM10.6)30. Conduct counselling session on family planning	Y	Small group discussion PBL Demonstration 2 hours	Written / Viva voce OSPE & OSCE

Field Posting (Clinical Postings) Community Medicine for MBBS Second Professional year

Topics	Number	COMPETENCIES	Hours
Environment & Health	CM 3.2 , CM 3.3 & CM3.4	CM 3.2 Describe concepts of safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting. & CM 3.3 Describe the etiology and basis of water borne diseases - Jaundice/ hepatitis and diarrheal diseases. CM3.4 Describe the concept of solid waste, human excreta and sewage disposal (CM3.4) 10. Describe the functioning of sewage treatment plant at site.	9 Hours
Nutrition	CM5.6 & CM5.7	CM5.6 Enumerate and discuss the National Nutrition Policy, important national nutritional Programs including the Integrated Child Development Services Scheme (ICDS) Etc CM5.7 Describe food hygiene	12 Hours
Epidemiology of Communicable & Non-Communicable	CM 8.1	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	15Hours
	CM 8.3	CM8.3 Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case	
Occupational Health	CM11.3	CM11.3 Enumerate and describe specific occupational health hazards, their risk factors and preventive measures	6 Hours
Hospital Waste Management	CM 14.1	CM 14.1 Define and classify hospital waste	6 Hours
Health Care of the Community	CM17.5	CM17.5 Describe health care delivery in India	12 Hours

Field Posting (Clinical Postings)

1stWeek

Field Posting	Competency Number	Observe and record new and follow the Suggestions	Method of Assessment
Field Posting	CM 3.2, CM 3.3, CM3.4&CM3.4	Describe concepts of safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting. (visit to water treatment plant) (3 Hours) Describe the etiology and basis of water borne diseases - Jaundice/ hepatitis and diarrheal diseases. (3 Hours) Describe the functioning of sewage treatment plant at site.(visit to Sewage Treatment Plant) (3 Hours)	Problem solving written OSPE
Field Posting	CM5.6	CM5.6 Enumerate and discuss the National Nutrition Policy, important national nutritional Programs including the Integrated Child Development Services Scheme (ICDS) Etc. (Visit to Anganwadi Centre) (6 Hours)	Problem solving written OSPE

2ndWeek

Field Posting	Competency Number	Observe and record new and follow the Suggestions	Method of Assessment
Field Posting	CM8.1 & CM8.3	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 CM8.3 Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case (Visit to RNTCP Cell, ICTC Cell & Malaria Cell) (15 Hours)	Problem solving written OSPE

3rdWeek

Field Posting	Competency Number	Observe and record new and follow the Suggestions	Method of Assessment
Field Posting	CM5.7	CM5.7 Describe food hygiene (Visit to Milk Factory) (6 Hours)	Problem solving written OSPE
Field Posting	CM11.3	CM11.3 Enumerate and describe specific occupational health hazards, their risk factors and preventive measures (Visit to Brick Factory / Industry) (6 Hours)	Problem solving written OSPE
Field Posting	CM 14.1	CM 14.1 Define and classify hospital waste(Visit to Hospital for BMW) (3 Hours)	Problem solving written OSPE

4th week

Field Posting	Competency Number	Observe and record new and follow the Suggestions	Method of Assessment
Field Posting	CM 14.1	CM 14.1 Define and classify hospital waste (Visit to Hospital for BMW) (3 Hours)	Problem solving written OSPE
Field Posting	CM17.5	CM17.5 Describe health care delivery in India (Visit to Health Centres-PHC, CHC, DHO office& sub centre) (12 Hours)	Problem solving written OSPE

Module on Pandemic Management, August 2020

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Phase II	2.2	Emerging and Re-emerging infections, early identification and control of new infections	6	Community Medicine
	2.4	Vaccination strategies including vaccine development & Implementation	6	Community Medicine, Biochemistry

2.2 Competencies addressed:

The student should be able to:	Level
Define emerging and re-emerging infections. Explain reasons or Identify factors responsible for emergence and re-emergence of these infectious diseases.	K
Discuss strategies for early identification, prevention and control of emerging and re-emerging infectious diseases.	K
Discuss the challenges faced in control/ prevention of these infections	KH

2.4 Competencies addressed:

The student should be able to:	Level
Describe the process of vaccine development.	KH
Describe the role of vaccines in disease control and eradication.	KH
Describe the steps to prepare a micro plan for vaccination activity at PHC level.	KH
Describe the importance of routine vaccination during pandemics.	KH
Describe the role of communities in vaccination programmes.	KH
Describe the cold chain for vaccine storage and delivery.	KH

Internal Assessment examination: 100 (Theory 100 and Practical/Clinical 100) Marks As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Community Medicine (Phase II)

1. Theory -100
2. Practical/Clinical-100

Theory: 100 marks

Total five internals will be conducted (one during phase I, Two during Phase II and Two during Phase III Part I) Average marks of all five notified theory internal assessment examinations (IAE) is taken into consideration for calculating the final internal assessment marks. Marks obtained by Periodic Assessment tests like Quiz, PCT, MCQs, will be added to theory internal marks.

Type of Questions	Number of questions	Marks for each question	Total
Multiple Choice Questions	20	1	20
Long Essay Questions	2	10	20
Short Essay Questions	6	5	30
Reasoning Questions / Short Answer Questions	10	3	30
Total marks			100

Note:

- Case Based Questions: 20% of total marks.
- Two questions based on integration (AITo) in Internal Assessment Examination and one question from AETCOM.
- A student who has not taken minimum required number of tests for Internal Assessment, each in theory and practical will not be eligible for University examinations.
- The results of Internal Assessment should be displayed on notice board within 2 weeks of the test and an opportunity to be provided to the students to discuss the results and get feedback on making their performance better.
- Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Practical/Clinical and Viva: 100 Marks

Five practical assessments will be conducted along with the Theory Internal Assessments. Average marks of the five practical IAE will be taken. The marks obtained for Logbook, Record Book and Professionalism will be added to practical IAE marks. Objective Structured Practical Examination will be a method of assessment in Internal Assessment and Summative examination.

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M.B.B.S Degree Program
Otorhinolaryngology Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

Otorhinolaryngology

Total teaching hours for MBBS Second Professional year

Subject	Clinical Posting hours	Skill lab hours	Total
Otorhinolaryngology	48	12	60

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

At least 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Otorhinolaryngology topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	History taking in ENT
2.	Examination in ENT
3.	Clinical Skills(Otoscopy, Tuning fork test)
4.	Diagnostic and Therapeutic procedures in ENT(DNE, Instillation ear/nose drops)
5.	Case discussion(Diseases of External ear, Acute/Chronic Rhinitis,Adenoiditis, ASOM)
6.	Operative Procedures in ENT(Myringotomy/Myringoplasty, Adenotonsillectomy)
7.	Audiology(Pure tone audiometry)

Bedside Clinics in Otorhinolaryngology for MBBS Second Professional year

Topics	Number	COMPETENCIES	Core	Teaching – learning Method	Assessment Method	Hours
General ENT examination	EN2.1	Elicit document and present an appropriate history in a patient presenting with an ENT complaint.	Y	Small group discussion Demonstration	OSCE	9
Headlamp examination	EN2.2	Demonstrate the correct use of a headlamp in the examination of the ear, nose and throat.	Y	DOAP session, Bedside clinic	OSCE	3
Ear examination	EN2.3	Demonstrate the correct technique of examination of the ear including otoscopy.	Y	DOAP session, Bedside clinic	OSCE	1 ½
Tuning fork tests	EN2.4	Demonstrate the correct technique of performance and interpret tuning fork tests.	Y	DOAP session, Bedside clinic	OSCE	3
Nose examination	EN2.5	Demonstrate the correct technique of examination of the nose and paranasal sinuses including the use of nasal speculum.	Y	DOAP session, Bedside clinic	OSCE	3
Oral Cavity & oropharyngeal examination	EN2.6	Demonstrate the correct technique of examining the throat including the use of a tongue depressor .	Y	DOAP session, Bedside clinic	OSCE	1 ½
Neck examination	EN2.7	Demonstrate the correct technique of examination of the neck including elicitation of laryngeal crepitus.	Y	DOAP session, Bedside clinic	OSCE	1 ½
Clinical Skill	EN2.14	Demonstrate the correct technique of instilling topical medications into the ear, simulated environment.	Y	DOAP session, Bedside clinic	OSCE	3

Otomicroscopy	EN3.1	Observe and describe the indications for and steps involved in the performance of Otomicroscopic examination in a simulated environment.	Y	Small group discussion Demonstration	Short essay/Viva Voce	3
Diagnostic nasal endoscopy	EN3.2	Observe and describe the indications for and steps involved in the performance of Diagnostic nasal endoscopy (DNE).	N	Small group discussion Demonstration	Short essay/Viva Voce	3
Clinical Skill	EN3.4	Observe and describe the indications for and steps involved in the removal of foreign bodies from Ear.	N	Small group discussion Demonstration	Short essay/Viva Voce	3
Myringotomy and Myringoplasty.	EN4.10	Observe and describe the indications for and steps involved in myringotomy and Myringoplasty.	Y	DOAP session	OSCE	3
Audiology	EN4.16	Observe and describe the indications for and steps involved in the performance of pure tone audiometry.	Y	DOAP session	OSCE	3
Diseases of External ear	EN4.2	Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of diseases of the external ear.	Y	Small group discussion DOAP session	OSCE, Short essay/Viva Voce	3
Acute and Chronic Rhinitis.	EN4.29	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of	Y	Small group discussion Bedside Clinic DOAP session	OSCE	3

		management of acute and chronic rhinitis				
Adenoids	EN4.26	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of adenoids	Y	Small group discussion Bedside Clinic DOAP session	OSCE, Short essay/Viva Voce	3
Acute Suppurative Otitis Media (ASOM)	EN4.3	Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of ASOM	Y	Small group discussion Bedside Clinic DOAP session	OSCE Short essay/Viva Voce,	3
Ear examination	EN4.4	Demonstrate the correct technique to hold visualize and assess the mobility of the tympanic membrane and its mobility and interpret and diagrammatically represent the findings	Y	Clinical Demonstration	OSCE Short essay/Viva Voce,	1 ½
Adeno tonsillectomy	EN4.40	Observe and describe the indications for and steps involved in a tonsillectomy / adenoidectomy	Y	DOAP session	Short essay/Viva Voce	3
Tracheostomy	EN4.50	Observe and describe the indications for and steps involved in tracheostomy.	Y	DOAP session	Short essay/Viva Voce	3

Clinical postings and skill lab

1st week

	Competency number	Competency addressed	Method of Assessment
OPD	EN2.1	Observe and record history in a patient presenting with an Ear complaint in OPD(1hr) ,DOAP(1hr), ,discussion (1 hr)	OSCE
OPD	EN2.1	Observe and record history in a patient presenting with a Nose complaints in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE
OPD	EN2.1	Observe and record history in a patient presenting with a Throat complaints in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE
OPD	EN2.2	Observe and record headlamp examination of the ear, nose and throat in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE
Skill lab	EN2.14	Observe ,record ,perform- instillation of topical medications into the ear/nose in mannequin. Small group discussion (1 hr) DOAP(1hr), Discussion and closure (1hr)	OSCE

2nd week

	Competency number	Competency addressed	Method of Assessment
OPD	EN2.3 EN2.4	Observe ,record& perform examination of the ear including otoscopy, assess the mobility of the tympanic membrane and interpret findings in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE
OPD	EN4.4	Observe ,record & perform and interpretation of tuning fork tests in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE ,Short essay/Viva Voce,

OPD/Ward	EN4.2	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of Diseases of the External ear). SGD,DOAP(1hr), Discussion and closure (1 hr)	OSCE, Short essay/Viva Voce,
Audiology	EN4.16	Observe ,record ,performance pure tone audiometry. SGD,DOAP(1hr), Discussion and closure (1 hr)	Short essay/Viva Voce,
Skill lab	EN3.1	Observe, record ,perform Otomicroscopic examination in a simulated environment(1hr) Demonstrate (1hr), discussion (1 hr)	OSCE Short essay/Viva Voce,

3rd week

	Competency number	Competency addressed	Method of Assessment
OPD	EN4.3	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination & management of a case of ASOM). SGD,DOAP(1hr), Discussion and closure (1 hr)	Short essay/Viva Voce,
O.T	EN4.10	Observe OT procedures(Myringotomy and Myringoplasty) and document in the logbook with Discussion(3hrs)	Short essay/Viva Voce,
OPD	EN2.5	Observe ,record & perform examination of the nose and paranasal sinuses in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE,
OPD	EN3.2	Observe ,record technique of Diagnostic nasal endoscopy (DNE) in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE,
Skill lab	EN3.4	Observe ,record & perform foreign bodies removal from Ear in mannequin(1hr), DOAP(1hr), discussion (1 hr)	OSPE ,Short essay/Viva Voce,

4th week

	Competency number	Competency addressed	Method of Assessment
OPD	EN4.29	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination & management of a case Acute /Chronic rhinitis). SGD,DOAP(1hr), Discussion and closure (1 hr)	Short essay/Viva Voce,
OPD	EN2.6 EN2.7	Observe ,record & perform examination throat & the neck in OPD(1hr), DOAP(1hr), discussion (1 hr)	OSCE Short essay/Viva Voce,
OPD	EN4.26	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination & management of a case Adenoids). SGD,DOAP(1hr), Discussion and closure (1 hr)	Short essay/Viva Voce,
OT	EN4.40	Observe OT procedures(Tonsillectomy / adenoidectomy) document in the logbook with Discussion(3hrs)	Short essay/Viva Voce
Skill lab/ OT	EN4.50	Observe OT procedures (Tracheostomy) document in the logbook with Discussion(3hrs)	Short essay/Viva Voce

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: ENT (Phase II)

1. Clinical-100

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
SRI DEVARAJ URS MEDICAL COLLEGE
Tamaka, Kolar

M.B.B.S Degree Program
Ophthalmology Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

DEPARTMENT OF OPHTHALMOLOGY

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting hours	Skill lab hours	Total
Ophthalmology	-	48	12	60

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

At least 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories)

Topics	Number	COMPETENCIES		Core	Teaching method	Assessment	Hours
AETCOM	AETCOM (1.3, 1.4,& 2.1):	Foundation Of Communication	Student should be able to demonstrate the ability to communicate to the patients in a patient, respectful, non threatening, non judgemental and empathetic manner.	Y	OSCE/OSPE	Formative Assessment	1Hour
VISUAL ACUITY ASSESSMENT	OP-1.2	I dentification & Uses Of Lenses	At the end of 45mins of clinical demonstration each student should be able to identify different types correcting lenses-Spherical / Cylindrical, convex/ concave, from a trial frame or spectacles : mention the uses.	Y	OSCE/OSPE	Formative Assessment	30mins
	OP1.3 DOAP	Visual Acuity Assessment	Student should be able to demonstrate the steps in performing the visual acuity assessment for (a) distance vision, (b) the pin hole test (c) near vision and (d) colour vision.	Y	OSCE/OSPE	Formative Assessment	1 and half hours
	OP1.3	Colour Vision	At the end of clinical demonstration each student should be able to demonstrate the a) assessment of colour vision of a patient and b) assess blink reflex and menace reflex.	Y	OSCE/OSPE	Formative Assessment	1 hour

	OP-1.3	Blink reflex & menace reflex	At the end of clinical demonstration each student should be able to demonstrate Blink reflex & menacereflex	Y	OSCE/OS PE	Formative Assessment	2hours
	OP 2.1	HordeolumInter num , Externum& Other Lid Swelling	Each student should be able to enumerate the causes, describe and discuss the aetiology, demonstrate the symptoms and signs of inflammatory conditions of the lids like- Hordeolumexter num/ internum, chalazion, hemangioma, dermoid.	Y	OSCE/OS PE	Formative Assessment	3hours
	OP 2.1, AETCOM 4.1	Blepharitis & Lid Hygiene	At the end of clinical demonstration each student should be able to enumerate the causes, demonstrate the signs of inflammatory conditions of the lids like Blepharitis and explain lid hygiene.	Y	OSCE/OS PE	Formative Assessment	3hours
	OP 2.1, 2.2	Lagophthalmos & Bell's Phenomenon	At the end of the class the student should be able to enumerate the causes, describe and discuss the aetiology, demonstrate the symptoms and signs of Lagophthalmos ; And demonstrate the procedure to elicit Bell's phenomenon in patient accurately in a	Y	OSCE/OS PE	Formative Assessment	3hours

			clinical setting and records the same.				
	OP 2.1	ACUTE DACROCYSTITIS	At the end of the clinical demonstration each student should be able to enumerate the causes and demonstrate the symptoms and signs of acute dacryocystitis.	Y	OSCE/OSPE	Formative Assessment	
Lids, Adnexa and Orbit	OP 2.1	Chronic Dacryocystitis	At the end of the clinical demonstration each student should be able to enumerate the causes and demonstrate the symptoms and signs of Chronic dacryocystitis.	Y	OSCE/OSPE	Formative Assessment	
	OP 2.2	Ocular General Examination	At the end of the class the student should be able to a BASIC ophthalmic examination using a pen torch pertaining ophthalmic symptoms given by the patient in a clinical setting and records the same. Maintain privacy	Y	OSCE/OSPE	Formative Assessment	
	OP 2.2, AETCOM 1.3, 1.4	History Taking	At the end of the class the student should be able to elicit a comprehensive history of ophthalmic symptoms given by the patient with respect to the mode of onset ,duration, severity, progression, accompaniment of each symptom and carry out the	Y	OSCE/OSPE	Formative Assessment	2hours

			general ocular examination.				
	OP 2.3 DOAP	. Lacrimal Regurgitation Test	Each student should be able to perform regurgitation test in a patient with Chronic Dacryocystitis.	Y	OSCE/OSPE	Formative Assessment	3hours
	OP 2.3	Massage Technique In Congenital Dacryocystitis	At the end of one hour clinical demonstration class each student should be able to demonstrate the correct massage technique in Congenital dacryocystitis.	Y	OSCE/OSPE	Formative Assessment	3hours
CONJUNCTIVA	OP 3.1	Conjunctival Congestion	At the end of three hours, each student should be able to elicit appropriate history regarding discharge, pain and congestion, enumerate the differential diagnosis of red eye and to identify the type of congestion – Conjunctival/ Ciliary.	Y	OSCE/OSPE	Formative Assessment	3hours
Cornea	OP 4.8 & OP 7.5	Instillation Of Eye Drops	Student should be able to demonstrate the correct technique of instillation of eye drops in a simulated environment.	Y	OSCE/OSPE	Formative Assessment	3hours
	OP 4.4	Tear Film Tests	At the end of 3 hours, each student should be able to take history, differentiate Aqueous deficiency dry eye'from	Y	OSCE/OSPE	Formative Assessment	3hours

			Evaporative dry eye ²				
IRIS AND ANTERIOR CHAMBER	OP 6.6	Assessment Of Anterior Chamber Depth	At the end of one hour, each student should be able assess the depth of anterior chamber and identify the abnormalities of anterior chamber.	Y	OSCE/OSPE	Formative Assessment	3hours
	OP 6.6 & OP 6.4	Iris Configuration	At the end of one hour, each student should be able to visualize the Normal iris colour, pattern and to note any abnormal changes .		OSCE/OSPE	Formative Assessment	3hours
	OP 6.6, SKILL AETCOM 3.3	Digital Tonometry	At the end of 30 minutes each student should be able to Explain the procedure,take consent and assess the IOP digitally.	Y	OSCE/OSPE	Formative Assessment	3hours
RETINA	OP 8.2, AETCOM 3.1 SKILL LAB	Examination of the Retina	At the end of one hour, each student should be able to understand the optics of direct ophthalmoscope, to identify a red glow and should be able to detect coloured lesions.	Y	OSCE/OSPE	Formative Assessment	3hours
	OP 8.3 SKILL LAB	SKILL LAB	At the end of three hours, each student should be able to assess the Optic disc , identify the various parameters of the disc& use it as a screening device to detect cupping , thinning of the Neuro retinal rim & Optic disc	Y	OSCE/OSPE	Formative Assessment	3hours

			changes in Glaucoma.				
	OP 8.3 SKILL LAB	RED /YELLOW /BLACK Lesions OF FUNDUS	At the end of 3 hours, each student should be able to understand the importance of examination of the visual system in the perspective of Neurological diagnosis .	Y	OSCE/OS PE	Formative Assessment	3hours
	OP 8.5 SKILL LAB	Examination of the Retina	At the end of one hour, each student should be able to focus on the disc and differentiate between the clinical features Papillitis, Papilloedema, Optic Atrophy and types of Optic atrophy.	Y	OSCE/OS PE	Formative Assessment	3hours
	OP 8.5, PY 10.17	Pupillary Reflex & Abnormality-I	At the end of three hours, each student should be able to demonstrate pupillary reflexes & abnormalities .	Y	OSCE/OS PE	Formative Assessment	3hours
MISCELLANEOUS	OP 9.1	Extra Ocular Movements	Student should be able to demonstrate and document the correct technique of extra ocular movements and note the presence of any strabismus or squint .	Y	OSCE/OS PE	Formative Assessment	3hours
INTEGRATION	I- PY 10.20	Finger Confrontation Testing	At the end of three hours, each student should be able to demonstrate pupillary reflexes & abnormalities.	Y	OSCE/OS PE	Formative Assessment	3hours

	OP 8.5, I- PY 10.18	Integration Of CNS With Visual System	At the end of 3 hours, each student should be able to understand the importance of examination of the visual system in the perspective of Neurological diagnosis .	Y	OSCE/OS PE	Formati ve Assessm ent	3hou rs

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Ophthalmology (Phase II)

1. Clinical-100

**SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION &
RESEARCH**

SRI DEVARAJ URS MEDICAL COLLEGE

Tamaka, Kolar

M.B.B.S Degree Program

GENERAL MEDICINE

Competencies for Second Professional year (PROFESSIONAL-II)

CBME CURRICULUM

2019-2020

GENERAL MEDICINE

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting hours	Skill lab hours	SDL	Total hours
General Medicine	25	48	12	Nil	85

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

Atleast 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

General Medicine topics for MBBS Second Professional year

Sl.No	THEORY TOPICS
1.	HIV
2.	Anemia
3.	Diabetes mellitus
4.	Thyroiddysfunction
5.	Obesity
6.	Nutritional andvitamindeficiencies
7.	Infections

Topics	CODE	COMPETENCIES	Core	Suggested Teaching Learning method	Suggested Assessment Method
HIV	IM6.1	Describe and discuss the symptoms and signs of acute HIV seroconversion	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM6.2	Define and classify HIV AIDS based on the CDC criteria	Y		
	IM6.3	Describe and discuss the relationship between CDC count and the risk of opportunistic infections	Y	Didactic Lecture(1 hour)	Short Essay/Short Answer/MCQ
	IM6.4	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related opportunistic infections	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM6.5	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related malignancies	Y		
	IM6.6	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related skin and oral lesions	Y	Didactic Lecture(1 hour)	Short Essay/Short Answer/MCQ
	IM6.11	Enumerate the indications and describe the findings for CT of the chest and brain and MRI	N		Short Essay/Short Answer/MCQ

	IM6.13	Describe and enumerate the indications and side effects of drugs for bacterial, viral and other types of diarrhea	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM6.16	Discuss and describe the principles of HAART, the classes of antiretrovirals used, adverse reactions and interactions	Y		Long Essay/Short Essay/Short Answer/MCQ
	IM6.17	Discuss and describe the principles and regimens used in post exposure prophylaxis	Y		Short Essay/Short Answer/MCQ
	IM6.18	Enumerate the indications and discuss prophylactic drugs used to prevent HIV related opportunistic infections	Y		Long Essay/Short Essay/Short Answer/MCQ
ANEMIA	IM9.1	Define, describe and classify anemia based on red blood cell size and reticulocyte count	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM9.2	Describe and discuss the morphological characteristics, aetiology and prevalence of each of the causes of anemia	Y		Long Essay/Short Essay/Short Answer/MCQ
	IM9.7	Describe and discuss the meaning and utility of various components	Y		Short Essay/Short

		of the hemogram			Answer/M CQ
	IM9.8	Describe and discuss the various tests for iron deficiency	Y	Didactic Lecture(1 hour)	Short Essay/Short Answer/M CQ
	IM9.11	Describe the indications and interpret the results of a bone marrow aspirations and biopsy	Y		Short Essay/Short Answer/M CQ
	IM9.12	Describe, develop a diagnostic plan to determine the aetiology of anemia	Y		Long Essay/Short Essay/Short Answer/M CQ
	IM9.14	Describe the national programs for anemia prevention	Y	Didactic Lecture(1 hour)	Short Essay/Short Answer/M CQ
	IM9.17	Describe the indications for blood transfusion and the appropriate use of blood components	Y		Short Essay/Short Answer/M CQ
	IM9.18	Describe the precautions required necessary when performing a blood transfusion	Y	Didactic Lecture(1 hour)	Short Essay/Short Answer/M CQ
	IM9.21	Determine the need for specialist consultation	Y		Short Essay/Short Answer/M CQ
DIABETES MELLITUS	IM11.1	Define and classify diabetes	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short

					rt Answer/M CQ
	IM11.2	Describe and discuss the epidemiology and pathogenesis and risk factors and clinical evolution of type 1 diabetes	Y		Long Essay/Sho rt Essay/Sho rt Answer/M CQ
	IM11.3	Describe and discuss the epidemiology and pathogenesis and risk factors economic impact and clinical evolution of type 2 diabetes	Y		Long Essay/Sho rt Essay/Sho rt Answer/M CQ
	IM11.4	Describe and discuss the genetic background and the influence of the environment on diabetes	N	Didactic Lecture(1 hour)	Short Essay/Sho rt Answer/M CQ
	IM11.5	Describe and discuss the pathogenesis and temporal evolution of microvascular and macrovascular complications of diabetes	Y		Long Essay/Sho rt Essay/Sho rt Answer/M CQ
	IM11.6	Describe and discuss the pathogenesis and precipitating factors, recognition and management of diabetic emergencies	Y	Didactic Lecture(1 hour)	Long Essay/Sho rt Essay/Sho rt Answer/M CQ
	IM11.9	Describe and recognise the clinical features of patients who present with a diabetic emergency	Y		Long Essay/Sho rt Essay/Sho rt Answer/M CQ
	IM11.10	Generate a differential diagnosis and prioritise based on clinical	Y		Long Essay/Sho rt

		features that suggest a specific aetiology			Essay/Short Answer/MCQ
	IM11.14	Recognise the presentation of hypoglycaemia and outline the principles on its therapy	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM11.16	Discuss and describe the pharmacologic therapies for diabetes their indications, contraindications, adverse reactions and interactions	Y		Long Essay/Short Essay/Short Answer/MCQ
	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	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM11.23	Describe the precipitating causes, pathophysiology, recognition, clinical features, diagnosis,	Y		Long Essay/Short Essay/Short

		stabilisation and management of diabetic ketoacidosis			Answer/M CQ
	IM11.24	Describe the precipitating causes, pathophysiology, recognition, clinical features, diagnosis, stabilisation and management of Hyperosmolar non ketotic state	N		Short Essay/Short Answer/M CQ
THYROID DYSFUNCTION	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	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/M CQ
	IM12.2	Describe and discuss the genetic basis of some forms of thyroid dysfunction	N		Short Essay/Short Answer/M CQ
	IM12.3	Describe and discuss the physiology of the hypothalamopituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/M CQ
	IM12.4	Describe and discuss the principles of radio iodine uptake in the diagnosis of thyroid disorders	Y		Short Essay/Short Answer/M CQ
	IM12.12	Describe and discuss the iodisation programs of the government of India	Y	Didactic Lecture(1 hour)	Short Essay/Short Answer/M CQ

	IM12.13	Describe the pharmacology, indications, adverse reaction, interactions of thyroxine and antithyroid drugs	Y		Long Essay/Short Essay/Short Answer/MCQ
OBESITY	IM14.1	Define and measure obesity as it relates to the Indian population	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM14.2	Describe and discuss the aetiology of obesity including modifiable and non-modifiable risk factors and secondary causes	Y		Long Essay/Short Essay/Short Answer/MCQ
	IM14.3	Describe and discuss the monogenic forms of obesity	N		Short Essay/Short Answer/MCQ
	IM14.4	Describe and discuss the impact of environmental factors including eating habits, food, work, environment and physical activity on the incidence of obesity	Y		Short Essay/Short Answer/MCQ
	IM14.5	Describe and discuss the natural history of obesity and its complications	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/MCQ
	IM14.13	Describe and enumerate the indications, pharmacology and side	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short

		effects of pharmacotherapy for obesity			rt Answer/M CQ
	IM14.14	Describe and enumerate the indications and side effects of bariatric surgery	Y		Short Essay/Short Answer/M CQ
	IM14.15	Describe and enumerate and educate patients, health care workers and the public on measures to prevent obesity and promote a healthy lifestyle	Y		Short Essay/Short Answer/M CQ
NUTRITIONAL AND VITAMIN DEFICIENCIES	IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/M CQ
	IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	Y		Long Essay/Short Essay/Short Answer/M CQ
	IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	Y	Didactic Lecture(1 hour)	Long Essay/Short Essay/Short Answer/M CQ
	IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	Y		Long Essay/Short Essay/Short Answer/M CQ

INFECTIONS	IM25.1	Describe and discuss the response and the influence of host immune status, risk factors and comorbidities on zoonotic diseases (e.g. Leptospirosis, Rabies) and non-febrile infectious disease (e.g. Tetanus)	Y	Didactic Lecture(2 hours)	Long Essay/Short Essay/Short Answer/MCQ
	IM25.2	Discuss and describe the common causes, pathophysiology and manifestations of these diseases	Y		Long Essay/Short Essay/Short Answer/MCQ
	IM25.3	Describe and discuss the pathophysiology and manifestations of these diseases	Y		Long Essay/Short Essay/Short Answer/MCQ
	IM25.8	Enumerate the indications for use of newer techniques in the diagnosis of these infections	N		Short Essay/Short Answer/MCQ

Bedside Clinics in General Medicine for MBBS Second Professional year

TOPIC-Heart Failure				
	IM 1.10	Elicit document and present an appropriate history that will establish the diagnosis, cause and severity of heart failure including: presenting complaints, precipitating and exacerbating factors, risk factors exercise tolerance, changes in sleep patterns, features suggestive of infective endocarditis	7 hours	OSCE/ OSPE/OSLER
	IM 1.11	Perform and demonstrate a systematic examination based on the history that will help establish the diagnosis and estimate its severity including: measurement of pulse, blood pressure and respiratory rate, jugular forms and venous pulses, peripheral pulses, conjunctiva and fundus, lung, cardiac examination including palpation and auscultation with identification of heart sounds and murmurs, abdominal distension and splenic palpation		OSCE/ OSPE/OSLER
	IM 1.12	Demonstrate peripheral pulse, volume, character, quality and variation in various causes of heart failure		OSCE/ OSPE/OSLER
	IM 1.13	Measure the blood pressure accurately, recognise and discuss alterations in blood pressure in valvular heart disease and other causes of heart failure and cardiac tamponade		OSCE/ OSPE/OSLER
	IM 1.14	Demonstrate and measure jugular venous distension		OSCE/ OSPE/OSLER
	IM1.15	Identify and describe the timing, pitch quality conduction and significance of precordial murmurs and their variations		OSCE/ OSPE/OSLER
ACUTE MI/IHD				
	IM2.6	Elicit document and present an appropriate history that includes onset evolution, presentation risk factors, family history, comorbid conditions, complications, medication, history of atherosclerosis, IHD and coronary syndromes	2 hours	OSCE/ OSPE/OSLER
	IM2.7	Perform, demonstrate and document a physical examination including a vascular and cardiac examination that is appropriate for the clinical presentation		OSCE/ OSPE/OSLER
	IM2.11	Order and interpret a Chest X-ray and markers of acute myocardial infarction		OSCE/ OSPE/OSLER
	IM2.12	Choose and interpret a lipid profile and identify the desirable lipid profile in the clinical context		OSCE/ OSPE/OSLER

FEVER & FEBRILE SYNDROME				
	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	3 hours	OSCE/ OSPE/OSLER
	IM4.10	Perform a systematic examination that establishes the diagnosis and severity of presentation that includes: general skin mucosal and lymph node examination, chest and abdominal examination (including examination of the liver and spleen)		OSCE/ OSPE/OSLER
LIVER DISEASES				
	IM5.9	Elicit document and present a medical history that helps delineate the aetiology of the current presentation and includes clinical presentation, risk factors, drug use, sexual history, vaccination history and family history	3 hours	OSCE/ OSPE/OSLER
	IM5.10	Perform a systematic examination that establishes the diagnosis and severity that includes nutritional status, mental status, jaundice, abdominal distension ascites, features of portosystemic hypertension and hepatic encephalopathy		OSCE/ OSPE/OSLER
HIV				
	IM6.7	Elicit document and present a medical history that helps delineate the aetiology of the current presentation and includes risk factors for HIV, mode of infection, other sexually transmitted diseases, risks for opportunistic infections and nutritional status.	3 hours	OSCE/ OSPE/OSLER
	IM6.8	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology for the presenting symptom		OSCE/ OSPE/OSLER
	IM6.10	Choose and interpret appropriate diagnostic tests to diagnose opportunistic infections including CBC, sputum examination and assessment cultures, blood cultures, stool analysis, CSF analysis and Chest radiographs		OSCE/ OSPE/OSLER
	IM6.15	Demonstrate in a model the correct technique to perform a lumbar puncture		OSCE/ OSPE/OSLER
RHEUMATOLOGICAL PROBLEMS				
	IM7.11	Elicit document and present a medical history that will differentiate the etiologies of disease	3 hours	OSCE/ OSPE/OSLER
	IM.7.12	Perform a systematic examination of y all joints, muscle and skin that will establish the diagnosis and severity of disease		OSCE/ OSPE/OSLER

IM7.13	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology		OSCE/ OSPE/OSLER
HYPERTENSION			
IM8.10	Perform a systematic examination that includes : an accurate measurement of blood pressure, fundus examination, examination of vasculature and heart	3 hours SKILL LAB	OSCE/ OSPE/OSLER
IM8.17	Perform and interpret a 12 lead ECG	3 hours SKILL LAB/ ECG Room/	OSCE/ OSPE/OSLER
ANEMIA			
IM9.3	Elicit document and present a medical history that includes symptoms, risk factors including GI bleeding, prior history, medications, menstrual history, and family history	1.5 hours	OSCE/ OSPE/OSLER
IM9.4	Perform a systematic examination that includes : general examination for pallor, oral examination, DOAP session of hyper dynamic circulation, lymph node and splenic examination		OSCE/ OSPE/OSLER
AKI & CKD			
IM10.12	Elicit document and present a medical history that will differentiate the aetiologies of disease, distinguish acute and chronic disease, Identify predisposing conditions, nephrotoxic drugs and systemic Causes	1.5 hours	OSCE/ OSPE/OSLER
IM10.13	Perform a systematic examination that establishes the diagnosis and severity including determination of volume status, presence of edema and heart failure, features of uraemia and associated systemic disease		OSCE/ OSPE/OSLER
IM10.20	Describe and discuss the indications to perform arterial blood gas analysis: interpret the data		OSCE/ OSPE/OSLER
IM10.21	Describe and discuss the indications for and insert a peripheral intravenous catheter		OSCE/ OSPE/OSLER
IM10.22	Describe and discuss the indications, demonstrate in a model and assist in the insertion of a central venous or a dialysis catheter	3 hours- SKILL LAB	OSCE/ OSPE/OSLER
DIABETES MELLITUS			
IM11.7	Elicit document and present a medical history that will differentiate the aetiologies of diabetes including risk factors, precipitating factors, lifestyle, nutritional history, family history, medication history, co-morbidities and target organ disease	3 hours	OSCE/ OSPE/OSLER
IM11.8	Perform a systematic examination that establishes the diagnosis and severity that	3 hours	OSCE/ OSPE/OSLER

		includes skin, peripheral pulses, blood pressure measurement, fundus examination, detailed examination of the foot (pulses, nervous and deformities and injuries)	SKILL LAB	
THYRIOD DISFUNCATION				
	IM.12.5	Elicit document and present an appropriate history that will establish the diagnosis cause of thyroid dysfunction and its severity	3 hours	OSCE/ OSPE/OSLER
	IM 12.7	Demonstrate the correct technique to palpate the thyroid		OSCE/ OSPE/OSLER
GI BLEEDING				
	IM15.2	Enumerate, describe and discuss the evaluation and steps involved in stabilizing a patient who presents with acute volume loss and GI bleed	1.5 hours	OSCE/ OSPE/OSLER
	IM15.4	Elicit and document and present an appropriate history that identifies the route of bleeding, quantity, grade, volume loss, duration, etiology, comorbid illnesses and risk factors		OSCE/ OSPE/OSLER
DIARRHEAL DISORDERS				
	IM16.4	Elicit and document and present an appropriate history that includes the natural history, dietary history, travel , sexual history and other concomitant illnesses	1.5 HOURS	OSCE/ OSPE/OSLER
	IM16.5	Perform, document and demonstrate a physical examination based on the history that includes general examination, including an appropriate abdominal examination		OSCE/ OSPE/OSLER
HEADACHE				
	IM17.2	Elicit and document and present an appropriate history including aura, precipitating aggravating and relieving factors, associated symptoms that help identify the cause of headaches	1hours	OSCE/ OSPE/OSLER
	IM17.4	Perform and demonstrate a general neurologic examination and a focused examination for signs of intracranial tension including neck signs of meningitis		OSCE/ OSPE/OSLER
CVA				
	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	8 hours	OSCE/ OSPE/OSLER
	IM18.5	Perform, demonstrate & document physical examination thatincludes general and a detailed neurologic examination asappropriate, based on the history		OSCE/ OSPE/OSLER
	IM18.6	Distinguish the lesion based on upper vs lower motor neuron, side,site and most probable nature of the lesion		OSCE/ OSPE/OSLER
	IM18.7	Describe the clinical features and distinguish, based on clinicalexamination, the various disorders of speech		OSCE/ OSPE/OSLER
POISONING				

	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	1hour	OSCE/ OSPE/OSLER
	IM20.5	Perform a systematic examination, document and present a physical examination that includes general examination, local examination, appropriate cardiac and neurologic examination		OSCE/ OSPE/OSLER
NUTRITION & VITAMIN				
	IM23.5	Counsel and communicate to patients in a simulated environment with illness on an appropriate balanced diet	Integrated with Nutrition 2 HOURS	OSCE/ OSPE/OSLER
GERIATRICS				
	IM24.2	Perform multidimensional geriatric assessment that includes medical, psycho-social and functional components	1.5 HOURS	OSCE/ OSPE/OSLER
MISCELLANEOUS INFECTIONS				
	IM 25.4	Elicit document and present a medical history that helps delineate the aetiology of these diseases that includes the evolution and pattern of symptoms, risk factors, exposure through occupation and travel	1.5 HOURS	OSCE/ OSPE/OSLER

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: General Medicine (Phase II)

1. Theory -200
2. Clinical -200

Note: The internal assessment of broader specialities should also include marks from all the allied specialities. General Medicine should include marks of Psychiatry, Dermatology, venereology and Leprosy and Respiratory Medicine including tuberculosis

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M.B.B.S Degree Program
General Surgery Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

GENERAL SURGERY

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting hours	Skill lab hours	Total
General Surgery	25	48	12	85

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

At least 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

General Surgery topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	METABOLIC RESPONSE TO INJURY
2.	SHOCK
3.	BLOOD AND BLOOD COMPONENTS
4.	BURNS
5.	WOUND HEALING AND WOUND CARE
6.	SURGICAL INFECTIONS
7.	TRAUMA
8.	SKIN AND SUBCUTANEOUS TISSUE
9.	BIOHAZARD DISPOSAL

Topics	Number	COMPETENCIES	Core	Didactic lectures	Assessment Method Written/Viva Voce
METABOLIC RESPONSE TO INJURY	SU1.1	Describe Basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.	Y	4 Hours	LEQ SEQ MCQ s
	SU1.2	Describe the factors that affect the metabolic response to injury.	Y		LEQ SEQ MCQ s
	SU1.3	Describe basic concepts of perioperative care.	Y		SEQ MCQ s
SHOCK	SU 2.1	Describe Pathophysiology of shock, types of shock & principles of resuscitation including fluid replacement and monitoring.	Y	4 Hours	LEQ SEQ SAQ MCQ s
	SU 2.2	Describe the clinical features of shock and its appropriate treatment.	Y		LEQ SEQ MCQ s
BLOOD AND BLOOD COMPONENTS	SU 3.1	Describe the indications and appropriate uses of blood and blood products and complications of blood transfusion.	Y	3 Hours	LEQ SEQ SAQ MCQ s
BURNS	SU 4.1	Elicit document and present history in a case of burns and perform physical examination. Describe pathophysiology of burns	Y	3 Hours	SEQ MCQ s
	SU 4.2	Describe clinical features, diagnose type and extent of burns and plan appropriate treatment	Y		LEQ SEQ SAQ MCQ s
	SU 4.3	Discuss the medico legal aspects in burn injuries	Y		SEQ MCQ s
WOUND HEALING AND WOUND CARE	SU5.1	Describe normal wound healing and factors affecting healing	Y	3 Hours	LEQ SEQ SAQ MCQ s
	SU5.3	Differentiate the various types of wounds, plan and	Y		LEQ SEQ SAQ

		observe management of wounds			MCQ s
	SU5.4	Discuss medicolegal aspects of wounds	Y		SEQ SAQ MCQ s
SURGICAL INFECTIONS	SU6.1	Define and describe the etiology and pathogenesis of surgical infections	Y	3 Hours	LEQ SEQ MCQ s
	SU6.2	Enumerate prophylactic and therapeutic antibiotics. Plan appropriate treatment	Y		SEQ SAQ MCQ s
BIOHAZARD DISPOSAL	SU15.1	Describe classification of hospital waste and appropriate methods of disposal.	Y	1 Hour	LEQ SEQ MCQ s
TRAUMA	SU17.1	Describe the Principles of FIRST AID	Y	1 Hour	SEQ MCQ s
Skin and subcutaneous tissue	SU18.1	Describe the pathogenesis, clinical features and management of various cutaneous and subcutaneous infections.	Y	3 Hours	LEQ SEQ SAQ MCQ s
	SU18.2	Classify skin tumors Differentiate different skin tumors and discuss their management.	Y		LEQ SEQ SAQ MCQ s

Methods of Assessment:

LAQ - Long essay Question

SAQ - Short essay Question

SEQ - Short answer Questions

MCQs

Bedside Clinics in General Surgery for MBBS Second Professional year

Topics	Number	COMPETENCIES	Hours	Assessment Method
Wound healing and wound care	SU5.2	Elicit, document and present a history in a patient presenting with wounds	3 Hours	OSCE
Skin and subcutaneous tissue	SU18.3	Describe and demonstrate the clinical examination of surgical patient including swelling and order relevant investigation for diagnosis. Describe and discuss appropriate treatment plan.	3 Hours	OSCE
Vascular diseases	SU27.2	Demonstrate the correct examination of the vascular system and enumerate and describe the investigation of vascular disease	3 Hours	OSCE
	SU27.8	Demonstrate the correct examination of the lymphatic system	3 Hours	OSCE
Abdomen	SU28.2	Demonstrate the correct technique to examine the patient with hernia and identify different types of hernias.	3 Hours	OSCE

Clinical postings and skill lab

1st week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (General scheme of History taking) SGD,DOAP(1hr), SDL, Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)
Ward	Follow up of assigned cases(1hr), Bedside clinics (General physical examination) SGD, DOAP(1hr), SDL, Discussion and closure (1hr)
Skill lab	Describe the Principles of FIRST AID Small group discussion (1 hr) DOAP(1hr), SDL, Discussion and closure (1hr)

2nd week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of Ulcer) SGD,DOAP(1hr), Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)
Ward	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of Swelling) SGD,DOAP(1hr), SDL, Discussion and closure (1 hr)
Skill lab	Demonstrate the steps in Basic Life Support. Transport of injured patient in a simulated environment Small group discussion (1 hr), DOAP(1 hr), SDL, Discussion and closure (1 hr)

3rd week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of Lymphatic system) DOAP(1hr), Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)
Ward	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of varicose vein) SGD,DOAP(1hr), SDL, Discussion and closure (1 hr)
Skill lab	Demonstrate maintenance of an airway in a mannequin or equivalent Small group discussion (1 hr) DOAP(1 hr), SDL, Discussion and closure (1 hr)

4th week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of PVD) DOAP(1hr), Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)

Ward	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of Inguino scrotal swelling) SGD,DOAP(1hr), Discussion and closure (1hr)
Skill lab	Observe blood transfusions. Small group discussion (1 hr) DOAP(1 hr), SDL, Discussion and closure (1 hr)

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: General Surgery (Phase II)

1. Theory -200
2. Clinical-200

Note: The internal assessment of broader specialities should also include marks from all the allied specialities. General Surgery should include marks of Orthopaedics, Dentistry, Anaesthesiology and Radio-diagnosis

Suggested Books

1. Short Practice of Surgery, Bailey & Love. 27th Edition
2. A Manual on Clinical Surgery, S.Das. 13th Edition

References

1. Textbook of Surgery, Sabiston, 20th Edition
2. Hamilton Bailey's Demonstrations of Physical signs in Clinical surgery
3. Kirks General Surgical Operations

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M.B.B.S Degree Program
Obstetrics and gynaecology Competencies for Second Professional year (Phase-II)
CBME CURRICULUM
2019-2020

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting hours	Skill lab hours	Total
Obstetrics and gynecology	25	20	12	57

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

At least 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Obstetrics and gynaecology topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	Development and anatomy of the female reproductive tract
2.	Physiology of ovulation, menstruation, fertilization, implantation and gametogenesis.
3.	Embryology of fetus, factors influencing fetal growth
4.	Development, anatomy and physiology of placenta and teratogenesis
5.	Pre-existing medical disorders and discuss their management
6.	Maternal high risk factors
7.	Clinical features, differential diagnosis of pregnancy
8.	Physiological changes in pregnancy
9.	Antenatal care
10.	Obstetric history including menstrual history, last menstrual period, previous obstetric history, comorbid conditions, past medical history and surgical history
11.	Vaccination in pregnancy
12.	Investigations including the use of ultrasound in the initial assessment and monitoring in pregnancy
13.	Physiology of normal labor, principles of induction and acceleration of labor
14.	Preterm labor, PROM and postdated pregnancy
15.	Vaginal discharge

Topics	Number	COMPETENCIES	Core	Suggested Teaching Learning method
Development and anatomy of the female reproductive tract	OBG1.1	What are Planes and diameters of the pelvis	Y	Didactic lecture (3 hours)
	OBG1.2	Classification of pelvis shapes	Y	
	OBG1.3	Describe Development of reproductive tract	Y	
Physiology of ovulation, menstruation, fertilization, implantation and gametogenesis	OBG 2.1	What is Physiology of ovulation.	Y	Didactic lecture (2 hours)
	OBG 2.2	What are Changes that occur in menstrual cycle	Y	
	OBG 2.3	How does Fertilization occur?	Y	(1 hr)
Embryology of fetus, factors influencing fetal growth	OBG 3.1	What are the factors influencing fetal growth?	Y	DIDACTIC LECTURE (1 HOUR)
	OBG 3.2	Explain the development of fetus	Y	
Development, anatomy and physiology of placenta and teratogenesis	OBG 4.1	What is the anatomy of placenta	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG 4.2	What is the physiology of placenta	Y	Didactic lecture (1 hr)
	OBG 4.4	Teratogenesis	Y	
Pre-existing medical disorders and discuss their management	OBG5.1	Describe how to identify preexisting medical disorders	Y	Didactic lecture (1 hr)
	OBG5.2	How to identify the pre-existing medical disorders	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG5.3	Management of pre exiting medical disorders	Y	Didactic lecture (1 hr)

				discussion (1 hr) Discussion and closure (1 hr)
Maternal high risk factors	OBG6.1	What are maternal high risk factors	Y	Didactic lecture (1hr)
	OBG6.2	How to verify immunization status	Y	Didactic lecture (1hr)
Clinical features, differential diagnosis of pregnancy	OBG7.1	what are the clinical features of pregnancy	Y	Didactic lecture (1hr)
	OBG7.2	What are the differential diagnosis of pregnancy		
	OBG7.3	What are the principles of pregnancy tests		
	OBG7.4	How to interpret pregnancy tests		
Physiological changes in pregnancy	OBG8.1	what are the changes in the genital tract during pregnancy	Y	Small group discussion,
	OBG8.2	what are the CVS, GIT, Respiratory and haematological changes?	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
Antenatal care	OBG9.1	Discuss antenatal care	Y	Didactic lecture (1hr)
	OBG9.2	What are the objectives of antenatal care	Y	
	OBG9.3	How to assess period of gestation	Y	
Obstetric history including menstrual history, last menstrual period, previous obstetric history, comorbid conditions, past medical history and surgical history	OBG10.1	How to present obstetric history, menstrual history, last menstrual period, previous obstetrical history		Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG10.2	What are the co morbid conditions	Y	

	OBG10.3	How to take and present past medical history, surgical history	Y	
Vaccination in pregnancy	OBG11.1	What are the types of vaccination in pregnancy	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG11.2	What are the indications for vaccination	Y	
Investigations including the use of ultrasound in the initial assessment and monitoring in pregnancy	OBG12.1	What are the investigations to be done during pregnancy	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG12.2	What are the indications for each investigation	Y	
Physiology of normal labor, principles of induction and acceleration of labor	OBG 13.1	What is the mechanism of normal labour	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG13.2	What is the mechanism of labour in occipito anterior presentation	Y	
	OBG13.3	What are the principles of induction of labor	Y	
	OBG13.4	What is the active management of third stage of labor	Y	
Preterm labor, PROM and postdated pregnancy	OBG14.1	Define preterm labor, PROM	Y	Small group discussion (1 hr) Discussion and closure (1 hr)
	OBG14.2	What is post dated pregnancy	Y	
	OBG14.3	What are the causes of preterm labor, PROM	Y	
	OBG14.4	What is the pathophysiology of preterm labor, PROM, post dated pregnancy.	Y	
	OBG14.5	What are the investigations to be done	Y	
Vaginal discharge	OBG15.1	Describe etiology and clinical features of vaginal candidiasis	Y	Small group discussion (1 hr)

				Discussion and closure (1 hr)
	OBG15.2	Describe the etiology and clinical features of trichomonas	Y	
	OBG15.3	Describe the clinical diagnosis and investigation to diagnose bacterial vaginosis	Y	

Bedside Clinicsin forMBBS Second Professional year

Topics	Number	COMPETENCIES	Hours	
Ante natal care	OG8.1	Enumerate Describe and discuss the objective of antenatal care, assesment of period of gestation screening for high risk		Bedside clinics
Ante natal case History taking	OG8.2	Elicit document and present an obstetrics history including menstrual history , last menstrual period ,previous obstetrics history comorbid conditions ,past menstrual history and surgical history.		Bedside clinics
Ante natal case examination	OG8 . 3	Describe demonstrate document and perform an obstetrical examination including a general and abdominal examination and clinical monitoring of maternal and fetal well being		Bedside clinics
	OG8.4	Determine gestational age, EDD, obstetric formula		
	OG8.4	Describe and demonstrate clinical monitoring of maternal and fetal well being		Bedside clinics
Nutrition in pregnancy	OG8.6	Asses and counsel a patient in a stimulated environment regarding appropriate nutrition in pregnancy		Bedside clinics
Medical termination of pregnancy	OG9.2	Describe the step and observe assist in the performance of an MTP evacuation		Bedside clinics
Antepartum hemorrhage in pregnancy	OG 10.1	Define, classify and describe the etiology and pathogenesis, clinical features , USG and differential diagnosis and management of Antepartum hemorrhage in pregnancy		Bedside clinics

anaemia in pregnancy	OG 12.2	Define , Classify and describe the etiology and pathophysiology , Diagnosis, investigations, adverse effects on the mother and fetus and the management during pregnancy and labour and complications of anaemia in pregnancy		Bedside clinics
diabetes in pregnancy	OG.12.3	Define , Classify and describe the etiology and pathophysiology , Diagnosis, investigations, criteria, Adverse effects on the mother and fetus and the management during pregnancy and labour and complications of diabetes in pregnancy		Bedside clinics
Abnormal Labour	OG 14.4	Describe and discuss the classification, Diagnosis and Management of Abnormal Labour		Bedside clinics
puerperium	OG 19.1	Describe and discuss the physiology of puerperium , It's complications , diagnosis and management counselling for contraception, Purpureal sterilization		Bedside clinics
Vaginal discharge	OG 22.2	Describe and discuss the etiology (With special emphasis on candida, T.Vaginalis, Bacterial Vaginosis) , Characteristics , Clinical diagnosis, Investigations, genital hygiene, Management of common causes and the syndromic management		Bedside clinics
fibroid uterus	OG29.1	Describe and discuss the etiopathogenesis clinical features differential diagnosis principal management of complication of fibroid uterus		Bedside clinics

Clinical postings and skill lab

1st week

OPD	Competency number	Observe and record new and follow up cases in OPD(2hrs) 8.2 (1hr)	Method of Assessment
Post Admission day ward rounds		Follow up of assigned cases(1hr), Bedside clinics (General scheme of History taking) SGD,DOAP(1hr), SDL, Discussion and closure (1hr)	
OT		Observe OT procedures and document in the logbook with Discussion(3hrs)	
Ward		Follow up of assigned cases(1hr), Bedside clinics (General physical examination) SGD, DOAP(1hr), SDL, Discussion and closure (1hr)	
Skill lab		Describe the Principles of catheterization Small group discussion (1 hr) DOAP(1hr), SDL, Discussion and closure (1hr)	

2nd week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of eclampsia patient SGD,DOAP(1hr), Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)
Ward	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of ante natal case) SGD,DOAP(1hr), SDL, Discussion and closure (1 hr)
Skill lab	Demonstration of obstetrical examination with mannequin Small group discussion (1 hr), DOAP(1 hr), SDL, Discussion and closure (1 hr)

3rd week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of post natal case) DOAP(1hr), Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)
Ward	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of ANTE NATAL CASE) SGD,DOAP(1hr), SDL, Discussion and closure (1 hr)
Skill lab	Demonstration of fetal skull with mannequin Small group discussion (1 hr) DOAP(1 hr), SDL, Discussion and closure (1 hr)

4th week

OPD	Observe and record new and follow up cases in OPD(2hrs)
Post Admission day ward rounds	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of gestational diabetes patient) DOAP(1hr), Discussion and closure (1hr)
OT	Observe OT procedures and document in the logbook with Discussion(3hrs)
Ward	Follow up of assigned cases(1hr), Bedside clinics (History taking, physical examination of a case of post natal case) SGD,DOAP(1hr), Discussion and closure (1hr)
Skill lab	Observe blood transfusions. Small group discussion (1 hr) DOAP(1 hr), SDL, Discussion and closure (1 hr)

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Obstetrics and Gynaecology (Phase II)

1. Theory -200
2. Clinical-200

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M.B.B.S Degree Program
Paediatrics Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting & Skill lab hours	Total hours
Paediatrics	00	30	30

The clinical postings in second professional shall be 15 hours per week (3 hours per day from Monday to Friday) for 2 weeks

At least 3 hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Clinical Posting/ Training and Skill Lab

At the end of Clinical posting, Phase II MBBS student should demonstrate the ability to....

1. Elicit detailed pediatric and neonatal history taking.
2. Perform physical examination of neonates and children including anthropometry and its interpretation.
3. Perform developmental assessment of a child.
4. Observe the handling, storage and administration of vaccines.
5. Assess change in clinical status.
6. Communicate effectively with patients, parents, colleagues and other health care professionals.

Course Content:

Topic	Competency No & Competencies	Core Non core		Assessment Method
Normal Growth and Development	PE 1.4 Perform anthropometric measurements, document in growth charts and interpret	√		OSCE
Common problems related to growth	PE 2.2 Assessment of a child with failing to thrive including eliciting an appropriate history and examination. PE 2.5 Assessment of a child with short stature: Elicit history, perform examination, document and present.	√		OSCE
Common problems related to development-1 (Developmental delay and Cerebral palsy)	PE 3.3 Assessment of a child with developmental delay - Elicit document and present history.	√		OSCE
Adolescent Health and Common problems related to adolescent health	PE 6.9 Perform routine Adolescent Health check - up including eliciting history, performing examination including SMR (Sexual Maturity Rating), growth assessments (using Growth charts) and systemic exam including thyroid and Breast exam and the HEADSS screening.	√		OSCE
Complementary Feeding	PE 8.4 Elicit history on the Complementary Feeding habits	√		OSCE
Normal nutrition, assessment and monitoring	PE 9.4 Elicit, document and present an appropriate nutritional history and perform a dietary recall. PE 9.5 Calculate age related calorie requirement in health and disease and identify gap.	√		Document in logbook; OSCE
Obesity in children	PE 11.3 Assessment of a child with obesity with regard to eliciting history including physical activity, charting and dietary recall. PE 11.4 Examination including calculation of BMI, measurement of waist hip ratio, identifying external markers like acanthosis, striae, pseudo-gynecomastia etc. PE 11.5 Calculate BMI, document in BMI chart and interpret (Certifiable skill).	√		Document in logbook; OSCE

National Programs, RCH - Universal Immunizations program	PE 19.10 Observe the handling and storing of vaccines. PE 19.11 Document Immunization in an immunization record PE 19.12 Observe the administration of UIP vaccines.	√		Document in log book
Care of the Normal New born, and High risk New born	PE 20.1 Define the common neonatal nomenclatures including the classification and describe the characteristics of a Normal Term Neonate and High-Risk Neonates PE 20.4 Assessment of a normal neonate.	√		Viva; OSCE
Genito-Urinary system	PE 21.8 Elicit, document and present a history pertaining to diseases of the Genitourinary tract.	√		OSCE
Cardiovascular system- Heart Diseases	PE 23.7 Elicit appropriate history for a cardiac disease, analyze the symptoms e.g. breathlessness, chest pain, tachycardia, feeding difficulty, failing to thrive, reduced urinary output, swelling, syncope, cyanotic spells, Suck rest cycle, forehead sweating in infants. Document and present. PE 23.8 Identify external markers of a cardiac disease e.g. Cyanosis, Clubbing, dependent edema, dental caries, arthritis, erythema rash, chorea, subcutaneous nodules, Osler's node, Janeway lesions and document. PE 23.9 Record pulse, blood pressure, temperature and respiratory rate and interpret as per the age. PE 23.10 Perform independently examination of the cardiovascular system look for precordial bulge, pulsations in the precordium, JVP and its significance in children and infants, relevance of percussion in Pediatric examination, Auscultation and other system examination and document	√		OSCE
Diarrhoeal diseases and Dehydration	PE 24.9 Elicit, document and present history pertaining to diarrheal diseases PE 24.10 Assess for signs of dehydration, document and present.	√		OSCE
Acute and chronic liver disorders	PE 26.5 Elicit document and present the history related to diseases of Gastrointestinal system. PE 26.6 Identify external markers for GI and Liver disorders e.g. Jaundice, Pallor, Gynecomastia, Spider angioma, Palmar	√		OSCE

	erythema, Ichthyosis, Caput medusa, Clubbing, failing to thrive, Vitamin A and D deficiency. PE 26.7 Perform examination of the abdomen, demonstrate organomegaly, ascites etc.			
Respiratory system	PE 28.9 Elicit, document and present age appropriate history of a child with upper respiratory problem including Stridor PE 28.11 Perform throat examination using tongue depressor PE 28.12 Perform examination of the nose	√		OSCE
Anemia and other Hemato-oncologic disorders in children	29.10 Elicit, document and present the history related to Hematology 29.11 Identify external markers for hematological disorders e.g. Jaundice, Pallor, Petechiae purpura, Ecchymosis, Lymphadenopathy, bone tenderness, loss of weight, Mucosal and large joint bleed.	√		OSCE
Systemic Pediatrics- Central Nervous system	PE 30.17 Elicit document and present an age appropriate history pertaining to the CNS. PE 30.18 Demonstrate the correct method for physical examination of CNS including identification of external markers. Document and present clinical findings.	√		OSCE
Allergic Rhinitis , Atopic Dermatitis, Bronchial Asthma , Urticaria Angioedema	31.6 Recognize symptoms and signs of asthma in a child.	√		OSCE
Endocrinology	PE 33.9 Perform Sexual Maturity Rating (SMR) and interpret.	√		OSCE
Vaccine preventable Diseases - Tuberculosis	PE 34.5 Able to elicit, document and present history of contact with tuberculosis in every patient encounter. PE 34.6 Identify a BCG scar (Certifiable skill).	√		OSCE

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Pediatrics (Phase II)

1. Clinical-100

Ward leaving Internal Assessment: OSCE

Recommended Books:

Clinical Methods:

Hutchison's Clinical Methods by M Swash (Latest edition)

Pediatrics Clinical Methods by Meharban Singh (Latest edition)

Textbook for Pediatrics:

IAP Textbook of Pediatrics (Latest edition)

“Essentials of Pediatrics” by OP Ghai, Vinod K Paul, Piyush Gupta (Latest edition)

“Care of the Newborn” by Meharban Singh (Latest edition)

Reference Books:

“Nelson Textbook of Pediatrics” by Richard E Behrman, Robert M Kliegman, Waldo E Nelson, Victor C Vaughan (Latest edition)

“Rudolph's Pediatrics” by Abraham M Rudolph, Julien IE Hoffman, Colin D Rudolph, Paul Sagan (Latest edition)

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
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Tamaka, Kolar

M.B.B.S Degree Program
Orthopaedics Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

Total teaching hours for MBBS Second Professional year

Subject	Clinical Posting hours	Skill lab hours	Total hours
Orthopaedics	24	6	30

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

Atleast 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Orthopaedics topics for MBBS second professional

Sl. no	Topics
1	Skeletal Trauma, Poly trauma
2	Fractures
3	Musculoskeletal Infection
4	Skeletal Tuberculosis

Bedside clinics in Orthopaedics for MBBS Second professional year

Topics	Number	Competencies	Hours
Skeletal Trauma, Poly trauma	1.1	Elicit, document and present a history in a patient presenting with skeletal trauma	6
Fractures	1.5 2.15	Describe and demonstrate the clinical examination of patient presenting with fractures, dislocation and order relevant investigation for diagnosis. Describe and discuss appropriate treatment plan.	12
Musculoskeletal Infection	3.1	Demonstrate the correct examination of the patient with Musculoskeletal Infection and enumerate and describe the investigation for musculoskeletal infection	8
Skeletal Tuberculosis	4.1	Demonstrate the correct technique to examine the patient with Skeletal Tuberculosis.	4

Clinical postings and skill lab

1ST week

	Competency number		Hours	Method of Assessment
OPD	1.3 2.3	Observe and record new and follow up cases in OPD (3 hours)	3	OSCE
Post Admission day ward rounds	1.3 2.15 2.3 3.1 4.1	Follow up of assigned cases (1hr), Bedside clinics (General scheme of History taking)	3	OSCE

		SGD,DOAP(1hr), SDL, Discussion and closure (1hr)		
OT	3.2	Observe OT procedures and document in the logbook with Discussion(3hrs)	3	OSCE/ Simulation
Ward	1.3 2.15 2.16 3.1 4.1	Follow up of assigned cases(1hr), Bedside clinics (General physical examination) SGD, DOAP(1hr), SDL, Discussion and closure (1hr)	3	OSCE
Skill lab	13.1	Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in below knee slab application Small group discussion (1 hr) DOAP(1hr), SDL, Discussion and closure (1hr)	3	OSCE with Simulation based assessment

2nd week

	Competency number		Hours	Method of Assessment
OPD	1.3 2.3 2.15 3.1	Observe and record new and follow up cases in OPD(3hrs)	3	OSCE
Post Admission day ward rounds	1.3 2.15 2.3 3.1 4.1	Follow up of assigned cases(1hr), Bedside clinics (History taking and physical examination)	3	OSCE

		SGD,DOAP(1hr), Discussion and closure (1hr)		
OT	1.6 3.2	Observe OT procedures and document in the logbook with Discussion(3hrs)	3	OSCE/ Simulation
Ward	1.3 2.15 2.16 3.1 4.1	Follow up of assigned cases(1hr), Bedside clinics (History taking and physical examination) SGD,DOAP(1hr), SDL, Discussion and closure (1 hr)	3	OSCE
Skill lab	13.1	Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in Thomas splint application. Small group discussion (1 hr), DOAP(1 hr), SDL, Discussion and closure (1 hr)	3	OSCE with Simulation based assessment

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Orthopedics (Phase II)

1. Clinical-50 marks

The Clinical assessment will be conducted at the end of the posting and the marks will be forwarded to the Department of Surgery for final tally.

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M.B.B.S Degree Program
Respiratory Medicine Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

Respiratory Medicine

Total teaching hours for MBBS Second Professional year

Subject	Clinical Posting hours	Skill lab hours	Total
TB & CD	24	6	30

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

Atleast 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	Tuberculosis
2.	Obstructiveairwaydisease

Bedside Clinics in Respiratory Medicine for MBBS Second Professional year

Topics	Number	COMPETENCIES	Hours	Assessment method
Tuberculosis.	CT1..5	Elicit, document and present an appropriate medical history that includes risk factor, contacts, symptoms including cough and fever CNS and other manifestations	3	OSCE
	CT 1.6	Demonstrate and perform a systematic examination that establishes the diagnosis based on the clinical presentation that includes a a) general examination, b) examination of the chest and lung including loss of volume, mediastinal shift, percussion and auscultation (including DOAP session of lung sounds and added sounds) c) examination of the lymphatic system and d) relevant CNS examination	2	OSCE
	CT 1.7	Perform and interpret a PPD (mantoux) and describe and discuss the indications and pitfalls of the test	2	OSCE
	CT 1.9	Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing	2	OSCE
	CT 1.10	Perform and interpret an AFB stain	2	OSCE
	CT 1.11	Assisting the performance , outline the correct tests that require to be performed and interpret the results of pleural fluid aspiration	2	OSCE
	CT 1.18	Educate health care workers on National Program of	2	OSCE

		Tuberculosis and administering and monitoring the DOTS program		
	CT1.19	Communicate with patients and family in an empathetic manner about the diagnosis, therapy	2	OSCE
Obstructive airway disease	CT 2.8	Elicit document and present a medical history that will differentiate the aetiologies of obstructive airway disease, severity and precipitants	2	OSCE
	CT 2.9	Perform a systematic examination that establishes the diagnosis and severity that includes measurement of respiratory rate, level of respiratory distress, effort tolerance, breath sounds, added sounds, identification of signs of consolidation pleural effusion and pneumothorax	2	OSCE
	CT 2.10	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	1	OSCE
	CT2.11	Describe, discuss and interpret pulmonary function tests	1	OSCE
	CT2.12	Perform and interpret peak expiratory flow rate	1	OSCE
	CT2.14	Enumerate the indications for and interpret the results of : pulse oximetry, ABG, Chest Radiograph	1	OSCE
	CT 2.19	Develop a management plan for acute exacerbations including bronchodilators, systemic steroids, antimicrobial therapy	1	OSCE
	CT2.21	Describe discuss and counsel patients appropriately on smoking cessation	1	OSCE
	CT2.22	Demonstrate and counsel patient on the correct use of inhalers	1	OSCE
	CT2.23	Communicate diagnosis treatment plan and subsequent follow up plan to patients	2	OSCE

Clinical postings and skill lab

1st week

	Competency number	Competency	Method of assessment
OPD		Observe and record new and follow up cases in OPD	
Post admission day rounds	CT 1.5	Follow up of assigned cases (General scheme history taking) Elicit, document and present an appropriate medical history that includes risk factor, contacts, symptoms including cough and fever CNS and other manifestations	OSCE
Ward	CT2.8 CT2.10	Elicit document and present a medical history that will differentiate the aetiologies of obstructive airway disease, severity and precipitants Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology Discussion and closure.	OSCE OSCE
Skill lab	CT2.15	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology Discussion and closure	OSCE OSCE

2nd week

	Competency number	Competency	Method of assessment
OPD		Observe and record new and follow up cases in OPD.	OSCE

Post Admission day ward rounds	CT1.6	Follow up of assigned cases. Bedside clinics (History taking, physical examination of a pulmonary tb case) Demonstrate and perform a systematic examination that establishes the diagnosis based on the clinical presentation that includes a a) general examination, b) examination of the chest and lung including loss of volume, mediastinal shift, percussion and auscultation (including DOAP session of lung sounds and added sounds) c) examination of the lymphatic system and d) relevant CNS examination Discussion and closure.	OSCE
Ward	CT2.8 CT2.9 CT2.10	Follow up of assigned cases. Bedside clinics (History taking, physical examination of a COPD case) Elicit document and present a medical history that will differentiate the aetiologies of obstructive airway disease, severity and precipitants Perform a systematic examination that establishes the diagnosis and severity that includes measurement of respiratory rate, level of respiratory distress, effort tolerance, breath sounds, added sounds, identification of signs of consolidation pleural effusion and pneumothorax Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology Discussion and closure.	OSCE

Skill lab	CT2.11	Describe, discuss and interpret pulmonary function tests	OSCE
	CT2.12	Perform and interpret peak expiratory flow rate	
	CT2.14	Enumerate the indications for and interpret the results of : pulse oximetry, ABG, Chest Radiograph	

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Respiratory Medicine (Phase II)

1. Clinical-50

The Clinical assessment will be conducted at the end of the posting and the marks will be forwarded to the Department of Medicine for final tally.

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Tamaka, Kolar

M.B.B.S Degree Program
Psychiatry Competencies for Second Professional year (Phase-II)
CMBE CURRICULUM
2019-2020

PSYCHIATRY

Total teaching hours for MBBS Second Professional year – 30 hours

Subject	Lecture hours	Clinical Posting hours	Skill lab hours	Total
Psychiatry	NIL	24	6	30

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

Psychiatry topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	Introduction to Psychiatry
2.	History taking in Psychiatry
3.	Mental Status Examination
4.	Mental Health
5.	Common Mental Disorders

Clinical Postings in Psychiatry for MBBS Second Professional Year

Topics	Number	COMPETENCIES	Core	Suggested Teaching Learning method	Suggested Assessment Method
Introduction to Psychiatry	PSY1.1	Describe the growth of psychiatry as a medical specialty, its history and contribution to society	Y	Small group discussion(3 hr)	Written/Viva voce
	PSY 1.2	Define and distinguish normality and abnormality	Y		Written/Viva voce
History taking in Psychiatry	PSY 2.1	Elicit, present and document a history in patients presenting with a mental disorder	Y	Bedside clinic (1hr) DOAP session(2hrs)	Mini CEX
	PSY 2.2	Elicit and document a history and clinical examination in a patient with mental retardation	Y		Mini CEX
Mental Status Examination	PSY 3.1	Establish rapport and empathy with patients	Y	Bedside clinic (1 hr) DOAP session(2hrs)	DOPS
	PSY 3.2	Perform, demonstrate and document a mini-mental examination	Y		DOPS
Normal Mental Health	PSY 4.1	Define and describe the principles and components of learning memory and emotions	Y	Small group discussion (3hrs)	Written/Viva voce
	PSY 4.2	Describe the principles of personality development and motivation	Y		Written/Viva voce
Common Mental Disorders	PSY 5.1	Enumerate, describe and discuss important signs & symptoms of common mental disorders	Y	Bedside clinic (1hr) Small group discussion(2hrs)	Mini CEX
	PSY 5.2	Describe discuss and distinguish psychotic & non psychotic (Mood, Anxiety, Stress related) disorders			Written/Viva voce

Skill Lab

Competency no	Competency	Method of assessment
3.2	Perform detailed mini-mental examination	DOPS

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: (Phase II)

Clinical: 50marks

The Clinical assessment will be conducted at the end of the posting and the marks will be forwarded to the Department of Medicine for final tally.

**SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
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**M.B.B.S Degree Program
Radio-Diagnosis and Radio-Therapy Competencies for Second Professional
year (Phase-II)
CBME CURRICULUM
2019-2020**

Radio-Diagnosis

Total teaching hours for MBBS Second Professional year

Subject	Clinical Posting hours	Skill lab hours	Total
Radio-Diagnosis	13	11	24

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

At least 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Clinical postings and skill lab

Nu mb er	COMPETENCY	Domain	Level	Core	Suggested Teaching Learning method	Suggest ed Assess ment method	H ou rs
	The student should be able to	K/S/A/ C	K/KH/ SH/P	(Y/N)			
RD 1.1	Define radiation and the interaction of radiation and importance of radiation protection	K	KH	Y	Demonstration	OSCE	2h
RD 1.2	Describe the evolution of Radiodiagnosis. Identify various radiological equipment's In the current era	S	SH	Y	Demonstration	OSCE	1h
RD 1.3	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder of ENT	K/S	SH	Y	Demonstration	OSCE	2h
RD 1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Ob & Gy	K/S	SH	Y	Demonstration	OSCE	2h
RD 1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine	K/S	SH	Y	Demonstration	OSCE	2h

RD 1.6	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorders in surgery	K/S	SH	Y	Demonstration	OSCE	2h
RD 1.7	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Paediatrics	K/S	SH	Y	Demonstration	OSCE	2h
RD 1.8	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to common malignancies	K/S	SH	Y	Demonstration	OSCE	2h
RD 1.9	Describe the role of Interventional Radiology in common clinical conditions	K	KH	Y	Demonstration	OSCE	2h
RD 1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments	K	KH	Y	Demonstration	OSCE	2h
RD 1.11	Describe preparation of patient for common imaging procedures	K	KH	Y	Demonstration	OSCE	1h
RD 1.12	Describe the effects of radiation in pregnancy and the methods of prevention/ minimization of radiation exposure	K	KH	Y	Demonstration	OSCE	2h
RD 1.13	Describe the components of the PC & PNDT Act and its medico legal implications	K	KH	Y	Small group discussion Demonstration	OSCE	2h

M.B.B.S Degree Program
Radio-Therapy Competencies for Second Professional year (Phase-II)
CBME CURRICULUM
2019-2020

Radio-Therapy

Total teaching hours for MBBS Second Professional year

Subject	Clinical Posting hours	Skill lab hours	Total
Radio-Diagnosis	6	0	6

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

At least 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Clinical postings

Number	COMPETENCY	Domain	Level	Core	Suggested Teaching Learning method	Suggested Assessment method	Hours
	The student should be able to	K/S/A/C	K/KH/S/H/P	(Y/N)			
RT4.1	Describe and discuss teletherapy machine (Co60/LINAC)	K	KH	Y	Demonstration	Written/ Viva voce	1h
RT4.2	Enumerate, describe and discuss types of treatment plan, basic workflow of 2D/3DCRT/IMRT/IGRT	k	KH	Y	Demonstration	Written/ Viva voce	1h
RT4.3	Describe and discuss Brachytherapy machine (remote after loading)	K	KH	Y	Demonstration	Written/ Viva voce	1h
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	K/S	KH	Y	Demonstration	Written/ Viva voce	1h
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	K	K	Y	Demonstration / GROUP DISCUSSION	Written/ Viva voce	2Hr

Clinical Postings:

Day 1 :

RT4.1 Describe and discuss teletherapy machine (Co60/LINAC)

RT4.2 Enumerate, describe and discuss types of treatment plan, basic workflow of 2D/3DCRT/IMRT/IGRT

RT4.3 Describe and discuss Brachytherapy machine (remote after loading)

Day 2 :

RT4.7 Counsel patients regarding acute and late effects of radiation and supportive care

RT5.1 Describe and discuss cancer prevention, screening, vaccination, cancer registry

As per the GMER 2019 (Assessment module)

When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.

Internal assessment: Radio-diagnosis (Phase II)

Clinical: 50marks

The Clinical assessment will be conducted at the end of the posting and the marks will be forwarded to the Department of Surgery for final tally.

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M.B.B.S Degree Program
Dermatology, Venereology & Leprosy Competencies for Second Professional year
(Phase-II)
CMBE CURRICULUM
2019-2020

DERMATOLOGY, VENEREOLOGY & LEPROSY

Total teaching hours for MBBS Second Professional year

Subject	Lecture hours	Clinical Posting hours	Skill lab hours	Total
DVL	NIL	24	6	30

The clinical postings in second professional shall be 15hours per week (3hours per day from Monday to Friday)

Atleast 3hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories

Dermatology, Venereology & Leprosy topics for MBBS Second Professional year

SL. NO.	TOPIC
1.	ACNE
2.	VITILIGO
3.	PAPULOSQUAMOUS DISORDER
4.	LICHEN PLANUS
5.	SCABIES
6.	PEDICULOSIS
7.	FUNGAL INFECTIONS
8.	VIRAL INFECTIONS
9.	LEPROSY
10.	SEXUALLY TRANSMITTED DISEASES
11.	VESICULOBULLOUS LESIONS
12.	URTICARIA AND ANGIOEDEMA
13.	PYODERMA

CLINICAL POSTING TIME TABLE FOR MBBS SECOND PROFESSION.

Sl No.	Topic	Core (Y/N)	Competency	Suggested Teaching Learning method	Suggested Assessment method
1	Definitions of primary, secondary and special lesions. Identify and grade the various common types of acne	Y	1.2	Bedside clinic	Skill assessment
2	Identify and differentiate vitiligo from other causes of hypopigmented lesions	Y	2.1	Bedside clinic	Skill assessment
3	Identify and distinguish psoriatic lesions from other causes	Y	3.1	Bedside clinic	Skill assessment/Written/Viva voce
4	Demonstrate the grattage test	Y	3.2	Bedside clinic	Skill assessment
5	Identify and distinguish lichen planus lesions from other causes	Y	4.1	Bedside clinic	Skill assessment
6	Identify and differentiate scabies from other lesions in adult and children	Y	5.2	Bedside clinic	Skill assessment
7	Identify and differentiate pediculosis from other skin lesions in adults and children	Y	6.2	Bedside clinic	Skill assessment
8	Identify Candida species in fungal scrapings and KOH mount	Y	7.2	DOAP Session	Skill assessment
9	Identify and distinguish herpes simplex and herpes labialis from other skin lesions	Y	8.2	DOAP Session	Skill assessment
10	Identify and distinguish herpes zoster and varicella from other skin lesions	Y	8.3	DOAP Session	Skill assessment
11	Identify and distinguish viral warts from other skin lesions	Y	8.4	DOAP Session	Skill assessment
12	Identify and distinguish molluscum contagiosum from other skin lesions	Y	8.5	DOAP Session	Skill assessment

13	Enumerate the indications, describe the procedure and perform a Tzank smear	Y	8.6	DOAP Session	Skill assessment
14	Demonstrate (and classify based on) the clinical features of leprosy including an appropriate neurologic examination	Y	9.2	Bedside clinic	Bedside clinic /Skill assessment
15	Enumerate the indications and observe the performance of a slit skin smear in patient with leprosy	Y	9.3	Bedside clinic, DOAP Session	Written/Viva voce
16	Identify and spirochete in a dark ground microscopy	Y	10.2	DOAP Session	Skill assessment
17	Counsel in a non-judgmental and empathetic manner patients on prevention of sexually transmitted disease	Y	10.5	DOAP Session	Skill assessment
18	Distinguish bulla from vesicles	Y	13.1	Bedside clinic	Skill assessment
19	Demonstrate the Tzanck test, nikolsky sign and bulla spread sign	Y	13.2	Bedside clinic	Skill assessment
20	Calculate the body surface area of involvement of vesiculobullous lesions	Y	13.3	Bedside clinic	Skill assessment
21	Identify and distinguish urticarial from other skin lesions	Y	14.2	Bedside clinic	Skill assessment
22	Demonstrate dermographism	Y	14.3	Bedside clinic	Skill assessment
23	Identify and distinguish angioedema from other skin lesions	Y	14.4	Bedside clinic	Skill assessment
24	Identify and distinguish folliculitis impetigo and carbuncle from other skin lesions	Y	15.1	Bedside clinic	Skill assessment
25	Identify staphylococcus on a gram stain	Y	15.2	Bedside clinic	Skill assessment

As per the GMER 2019 (Assessment module)

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Internal assessment: (Phase II)

Clinical: 50 marks

The Clinical assessment will be conducted at the end of the posting and the marks will be forwarded to the Department of Medicine for final tally.