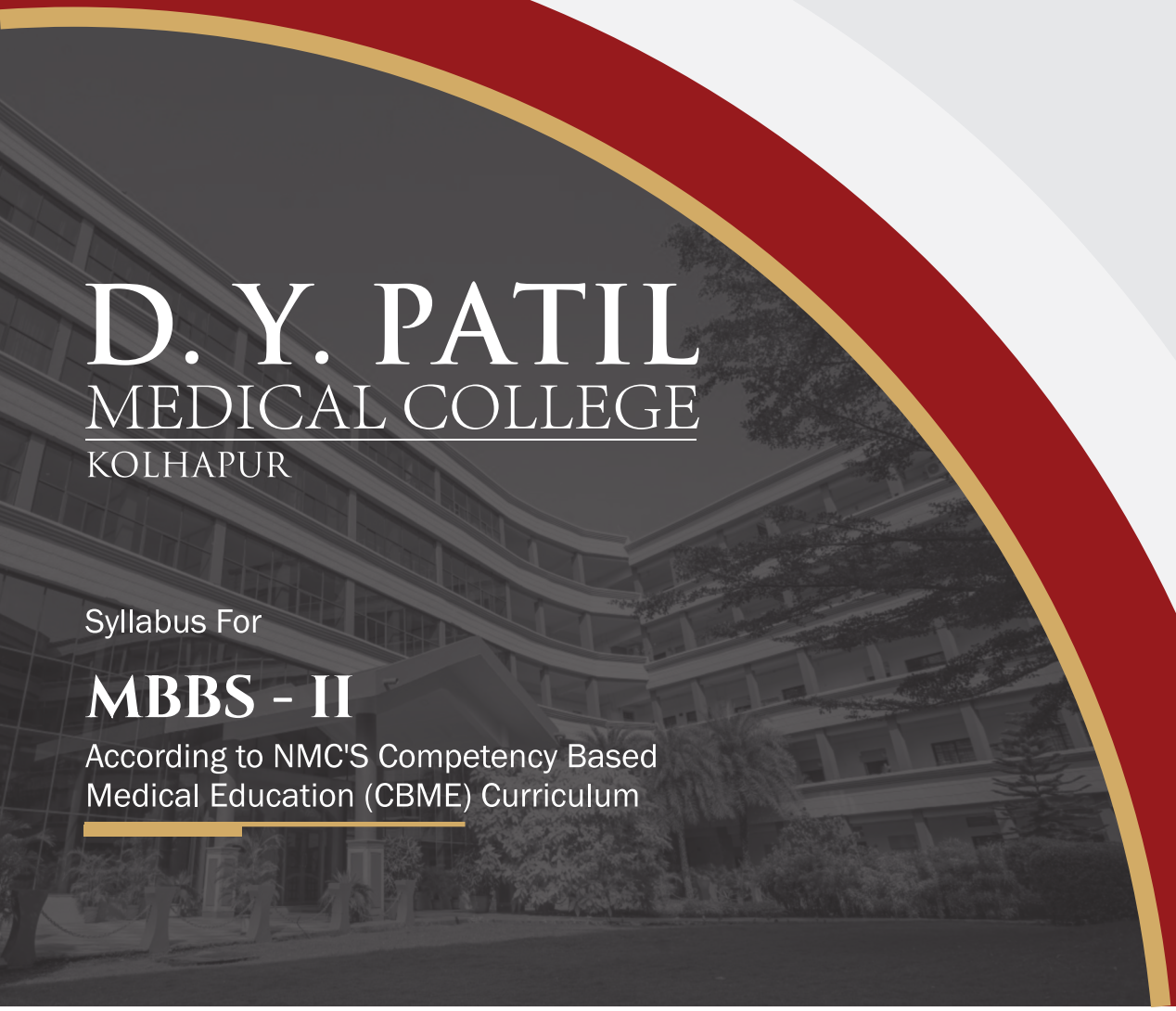
D.Y. PATIL EDUCATION SOCIETY
[Deemed to be University], Kolhapur
Re-accredited by NAAC with 'A' Grade

D. Y. PATIL
MEDICAL COLLEGE
KOLHAPUR



Syllabus For

MBBS - II

According to NMC'S Competency Based
Medical Education (CBME) Curriculum

D. Y. PATIL EDUCATION SOCIETY, KOLHAPUR

(DEEMED TO BE UNIVERSITY)

D. Y. PATIL MEDICAL COLLEGE, KOLHAPUR

Syllabus For

MBBS - II

(According to NMC'S Competency Based
Medical Education (CBME) Curriculum)

Year of Implementation : 2022-23
Year of Examination : 2022-23

PHARMACOLOGY

Vision

- To become a world class dynamic institution of education, research and training to develop globally competitive professional and socially responsible human resource.

Mission

- To ensure globally relevant quality higher education and skill enhancement for providing required trained manpower to the nation & the world.
- To promote symbiotic relations with industry, academic & research institutions and community to meet the expectations of various stakeholders.
- To engage in interdisciplinary research and innovate for furtherance of knowledge, technology and growth.
- To put in place dynamic technocracy for effective use of emerging trends in curriculum development, andragogy, evaluation and system management.
- To provide an environment for holistic evolution of the learners as human, socially responsible and conscious of sustainable ecosystem.

Educational objectives

Knowledge

At the end of the course, the student shall be able to -

1. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs
2. List the indications, contraindications, interactions and adverse reactions of commonly used drugs
3. Indicate the use of appropriate drug in a particular disease with consideration of its cost, efficacy and safety for – individual needs, and mass therapy under national health programmes
4. Describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings
5. Integrate the list the drugs of addiction and recommend the management
6. Classify environmental and occupational pollutants and state the management issues

7. Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy and old age
8. Explain the concept of rational drug therapy in clinical pharmacology
9. State the principles underlying the concept of `Essential Drugs'
10. Evaluate the ethics and modalities involved in the development and introduction of new drugs

Skills

At the end of the course, the student shall be able to -

1. Prescribe drugs for common ailments
2. Identify adverse reactions and interactions of commonly used drugs
3. Interpret the data of experiments designed for the study of effects of drugs and bioassays which are observed during the study
4. Scan information on common pharmaceutical preparations and critically evaluate drug formulations.
5. Be well-conversant with the principles of pharmacy and dispense the medications giving proper instructions

Integration

Practical knowledge of rational use of drugs in clinical practice will be acquired through integrated teaching vertically with pre-clinical & clinical subjects and horizontally with other para-clinical subject

PROGRAME OUTCOMES

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

PO 1:

- Demonstrate knowledge of normal and abnormal human structure, function and development from a molecular, cellular, biologic, clinical, behavioural and social perspective.
- Demonstrate knowledge about established and evolving biomedical and clinical sciences.
- 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

PO 2:

- Demonstrate ability to apply this knowledge to the practice of medicine in routine, emergency and disaster situations.
- Demonstrate ability to appraise and assimilate scientific evidence into their own ongoing learning, research, and patient care.
- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context
- Demonstrate ability to provide evidence-based care that is compassionate, respectful of patients' differences, values, and preferences.

PO 3:

- Demonstrate commitment to the highest standards of professional responsibility towards patient, colleagues, society, growth of medical professional and adhere to universally accepted code of ethics.
- Demonstrate personal attributes of compassion, honesty, integrity, accountability, empathy in patient encounters.

PO 4:

- Demonstrate ability to communicate effectively, respectfully, non-judgemental, empathetic manner with patients, their families and colleagues that will improve patient satisfaction, health care and encourages participation and shared decision-making.
- Demonstrate the ability to listen clearly, inform, communicate and educate patients &/ caregivers for the promotion of health, diagnosis of disease and the treatment of illness; advocate for disease prevention, wellness and the promotion of healthy lifestyles including a focus on population health

PO 5:

- Demonstrate the ability to work effectively, efficiently & in rational way with his/ her colleagues and other team members, educate & motivate the team members in a manner to maximize the health delivery potential of the team, considering various roles, responsibilities and competencies of the other health professionals.
- Identify the self- potential, functioning ability as a team leader in primary and secondary health care settings, utilize various indicators of the health care system and to promote appropriate, low cost, ethical, fair and qualitative health delivery.

PO 6:

- Demonstrate ability to acquire new knowledge, skills and reflect upon their experience to enhance personal and professional growth and apply the information in the care of the patient.
- Demonstrate self-motivation and awareness to their own limitations.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

PO7:

- Demonstrate an attitude of inquiry/search/investigation, scientific and objective effort to uncover facts**.**

PO8:

- Demonstrate accountability in fulfilling their dutyfor the benefit of the entire society.

PO9:

- Demonstrates responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future.

COURSE OUTCOMES

CO1: Able to choose the appropriate, cost-effective drug or therapy and interpret these with clinical context to prescribe rationally.

CO2:To describe the pharmacokinetics and pharmacodynamics indications, contraindications, interactions and adverse reactions of essential and commonly used drugs

CO3: To explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy and old age & integrate the list the drugs of addiction and recommend the management.

CO4: To explain the concept of rational drug therapy in clinical pharmacology.

CO5: To demonstrate ability to evaluate the ethics and modalities involved in the development and introduction of new drugs

CO6: To demonstrate communication with patient with empathy and ethics on aspects of drug use.

CO7: To motivate patient with chronic disease to adhere to the prescribed management by the health care provider.

CO8: To demonstrate how to interact with pharmaceutical representative to get authentic information of drug.

CO9: To explain to the patient the relationship between cost of treatment and patient compliance.

CO10: To prepare and explain a list of p-drug for a given condition.

1. **Goal**

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

2. **Educational objectives**

(a) Knowledge

At the end of the course, the student shall be able to -

1. Describe the pharmacokinetics and pharmaco dynamics of essential and commonly used drugs
2. List the indications, contraindications, interactions and adverse reactions of commonly used drugs
3. Indicate the use of appropriate drug in a particular disease with consideration of its cost, efficacy and safety for –individual needs, and mass therapy under national health programmes.
4. Describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings
5. Integrate the list the drugs of addiction and recommend the management
6. Classify environmental and occupational pollutants and state the management issues
7. Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy and old age
8. Explain the concept of rational drug therapy in clinical pharmacology
9. State the principles underlying the concept of `Essential Drugs'
10. Evaluate the ethics and modalities involved in the development and introduction of new drugs

(b) Skills

At the end of the course, the student shall be able to -

1. Prescribe drugs for common ailments
2. Identify adverse reactions and interactions of commonly used drugs
3. Interpret the data of experiments designed for the study of effects of drugs and bioassays which are observed during the study
4. Scan information on common pharmaceutical preparations and critically evaluate drug formulations.
5. Be well-conversant with the principles of pharmacy and dispense the medications giving proper instructions.

(b) **Integration**- Practical knowledge of rational use of drugs in clinical practice will be acquired through integrated teaching vertically with pre-clinical & clinical subjects and horizontally with other para-clinical subject

Course Content
Second MBBS (From MARCH 2021)
Subject: PHARMACOLOGY Theory / Practical

Based on **National Medical Commission**, **Competency based Undergraduate curriculum for the Indian Medical Graduate,**

1. Total Teaching hours: 230 + 6

A. Lectures(hours): **80 hrs.**

B. Self-directed learning (hours): -**12Module – 12 hrs**

C. Small group teachings/tutorials/Integrated teaching/Practical (hours): **138 hrs.**
Including DOAP SESSIONS- 07module- 14 hrs & AETCOM Module- 03 module - 9 hrs

D. Pandemic Module – 01 module – **6hrs**

LIST OF DIDACTIC LECTURER SCHEDULE - PHASE- II

1. GENERAL PHARMACOLOGY.

Sr. No	Topic	Competency No.	Integration
1.	Principals of Pharmacology & Nomenclature of drug, sources of drugs	PH-1.1 & 1.9	
2.	Local and oral route of drug administrations	PH-1.11	
3.	Parenteral Routes of Administration and New drug delivery system	PH-1.11	
4.	Bioavailability absorption of drug (Definition Bioequivalence, AUC and factors affecting bioavailability	PH-1.4	
5.	Distribution and storage of drug (pro drug, plasma protein binding of a drug)	PH-1.4	
6.	Biotransformation (fate of drug) Phase – I, Phase-II, metabolism induction and Enzyme inhibition.	PH-1.4	
7.	Clinical pharmacokinetics- Plasma half-life, loading, maintenance lose.1st order and zero order kinetics of elimination	PH-1.4	
8.	Evidence based medicine, TDM	PH-1.2	
9.	Pharmacodynamics- I (mechanism or action of drug – Receptor meditated, enzyme and non-receptor mediated actions,)	PH-1.5	
10.	Pharmacodynamic – II synergism potentiation and antagonism	PH-1.5	
11.	Pharmacodynamic- III- factors Modifying effect of a drug	PH-1.5	
12.	ADR- Definition Types of ADRS	PH-1.7	
13.	Drug-Drug interaction	PH-1.8	
14.	Drug development Phases of clinical trial Good clinical Practice. (role of placebo in clinical trial.)	PH-1.64	
15.	Drug regulation acts and other legal aspects (Animal well fare and CPCSEA Guidelines)	PH-1.63	
SDL–1 Seminar	Excretion of drug New drug delivery system	PH-1.4 PH-1.3	

2. DRUGS AFFECTING AUTONOMIC NERVOUS SYSTEM-ANS

Sr. No	Topic	Competency No.	Integration
1.	Cholinergic I – Chronologic (Cholinergic agonists)	PH-1.14	
2.	Cholinergic -II- Anticholinesterases	PH-1.14	
3.	Anticholinergics	PH-1.14	
4.	Sympathomimetics – I (Adrenergic agonists) (catecholamines)	PH-1.13	
5.	Sympathomimetics – II (Non catecholamines (Adrenergic agonists - II))	PH-1.13	
6.	Alpha blockers (alpha blockers)	PH-1.13	
7.	Beta blockers (Beta blockers)	PH-1.13	
8.	Skeletal muscle relaxants	PH-1.15	Vertical integration physiology/Anaesthesia
Tutorial Seminar	Glaucoma Respecter concept and drug regulation.		

3. DRUGS FOR HEMATOLOGIC DISORDERS AND IMMUNO PHARMACOLOGY.

Sr. No	Topic	Competency No.	Integration
1.	Anemia (IDA)	PH-1.35	Vertical integration -physiology/Medicine
2.	Physiology of hemostasis and Antiplatelets	PH-1.25	Vertical integration -Physiology/Medicine
3.	Coagulation and Anticoagulants	PH-1.25	Vertical integration -physiology/Medicine
4.	Thrombolytics and Antibiotics	PH-1.25	Vertical integration -physiology/Medicine
5.	Immuno modulator and organ transplant rejection management and colony stimulating rectors.	PH-1.50	
6.	HIV (HIV)	PH-1.48	Horizontal integration -Microbiology
7.	Malaria- I	PH-1.47	Vertical integration- Medicine/ Microbiology
8.	Malaria - II	PH-1.47	Vertical integration- Medicine/ Microbiology
SDL-2 Seminar	Management of Megaloblastic anemia Vaccine	PH-1.54	

4. DRUGS AFFECTING CARDIOVASCULAR SYSTEM- CVS

Sr. No	Topic	Competency No.	Integration
1	Diuretic – I	PH-1.24	
2	Diuretic- II	PH-1.24	
3.	Calcium channel blockers (CCBs)	PH-1.27	
4.	Drugs acting on renin-angiotensin system	PH-1.26	Vertical integration physiology/Medicine
5.	Drugs for Angina	PH-1.28	Vertical integration Medicine
6.	Antihypertensive- I	PH-1.27	Vertical integration Medicine
7.	Antihypertensive- II	PH-1.27	Vertical integration Medicine
8.	Drugs used CCF(CCF)	PH-1.29	Vertical integration Medicine
9.	Ant arrhythmic drugs	PH-1.30	Vertical integration Medicine
SDL 3 Seminar	Management of Angina and MI Management of Shock	PH-1.28 PH-1.27	

5. DRUGS AFFECTING GASTROINTESTRAL SYSTEM.-GIT

Sr. No	Topic	Competency No.	Integration
1	Drugs used in Peptic ulcer – I	PH-1.34	Vertical integration Medicine
2	Drugs used in Peptic ulcer- II	PH-1.34	Vertical integration Medicine
3	Emetic and antiemetic	PH-1.34	Vertical integration Medicine
4	Constipation/Laxatives	PH-1.34	Vertical integration Medicine
5	Amoebiasis	PH-1.47	Vertical integration Medicine
SDL 4 Seminar	Anthelminthic Diarrheal (ORS)	PH-1.48 PH-1.34	

6. DRUGS AFFECTING RESPIRATORY SYSTEM.– RS

Sr. No	Topic	Competency No.	Integration
1.	Histamine and antihistaminic	PH-1.32	
2.	Bronchial asthma- I	PH-1.32	Vertical integration Medicine
3.	Bronchial asthma- II	PH-1.32	Vertical integration Medicine
4.	Mucolytics, Expectorant and Antitussives	PH-1.33	Vertical integration Medicine
5.	Drugs used in Tuberculosis I	PH-1.44	Vertical integration Respiratory Medicine
6.	Drugs used in Tuberculosis – II (with MDRS ADR)	PH-1.44,1.45	Vertical integration Respiratory Medicine
SDL 5 Seminar	Management of T. B Different National Programme	PH-1.44 PH-1.55	

7. DRUGS AFFECTING CENRAL NERVOUS SYSTEM –CNS

Sr. No	Topic	Competency No.	Integration
1.	Local anesthetics	PH-1.17	Vertical integration Anesthesia
2.	General anesthetics- I (Pre-anesthetic medication.)	PH-1.18	Vertical integration Anesthesia
3.	General anesthetics- II	PH-1.18	Vertical integration Anesthesia
4.	Sedative hypnotics (Barb BZD non BZDs)	PH-1.19	Vertical integration Physiology/Psychiatry
5.	Antiepileptic- I	PH-1.19	Vertical integration Physiology/Psychiatry
6.	Antiepileptic- II	PH-1.19	Vertical integration Physiology/Psychiatry
7.	NSAID	PH-1.16	Vertical integration Physiology/Psychiatry
8.	Opioid	PH-1.19	Vertical integration Physiology/Psychiatry
9	Antiparkinsonian agents	PH-1.19	Vertical integration Physiology/Psychiatry
10	Antipsychotics	PH-1.19	Vertical integration Physiology/Psychiatry
11	Anti-depressants Antianxiety drugs	PH-1.19	Vertical integration Physiology/Psychiatry
SDL 6 SDL 7 Seminar	Management of drug abuse, Opioid, Tobacco, Alcohol Sertonins agonist, antagonize, and Migraine – Management Rheumatoid arthritis, gout, Calcium metabolism and Osteoporosis -		PH-1.16 & PH- 1.36 PH-1.20, PH-1.21, PH-1.22, PH-1.23 PH-1.16,1.36

8. DRUGS AFFECTING ENDOCRINE SYSTEM & MISCELLANEOUS.

Sr. No	Topic	Competency No.	Integration
1	Thyroid – I	PH-1.36	Vertical integration Medicine
2	Thyroid- II	PH-1.36	Vertical integration Medicine
3	Diabetes Mellitus – I	PH-1.36	Vertical integration Medicine
4	Diabetes Mellitus- II	PH-1.36	Vertical integration Medicine
5	Gluco- corticoids- I	PH-1.38	
6	Gluco- corticoids- II	PH-1.38	
7	Sex hormones (Male and Female)	PH-1.37	
8	Female reproductive hormones contraceptives and predrilling agents, Drugs used in erectile dysfunction.	PH-1.39,1.40	Vertical integration Obg/Gynac
9	Uterine pharmacology (uterine stimulants and uterine relaxants)	PH-1.40	Vertical integration Obg/Gynac
SDL 8 SDL 9 SDL 10 Seminar	Chelating agent and Management of metal poison Occupational and environmental pesticides and food adulteration Obesity and measure to be taken with Hypolipemic drug Management of diabetics Vitamin, Drug supplement and Neuroleptics		PH-1.53 PH-1.51, PH-1.52 PH-1.31 PH-1.36

9. CHEMOTHERAPUTIC AGENTS

Sr. No	Topic	Competency No.	Integration
1	General principles of chemotherapy with Geriatric and pediatric pharmacology	PH-1.42,PH-1.56	
2	Sulphonamide and co-trimoxazole	PH-1.42	
3	Fluoroquinolones	PH-1.42	
4	Penicillin	PH-1.42	
5	Cephalosporin (Typhoid)	PH-1.42	
6	Tetracycline, Chloramphenicol, macro ides	PH-1.42	
7	Amino glycosides	PH-1.42	
8	Antifungal and skin pharmacology with antiseptics and disinfectants	PH-1.57	Vertical integration Dermatology
9	Anticancer drugs (Mechanism, classification, side effects, indications)	PH-1.49	
SDL 11 SDL 12 Seminar	Leprosy Management of Typhoid Pharmacotherapy of UTI/STD	PH-1.46 PH-1.42 PH-1.48	

SELF-DIRECTED LEARNING – SDL

Sr. No	Topic	Competency No.
PH-SDL-1	Excretion of drug	PH-1.4
PH-SDL-2	Megaloblastic-anemia	PH-1.35
PH-SDL-3	Management of Angina/Myocardial Infraction	PH-1.28
PH-SDL-4	Anti-helminthic	PH-1.48
PH-SDL-5	Management of Tuberculosis-DOTS	PH-1.44
PH-SDL-6	Management of Abuse with - Alcohol/Opioid/Tobacco	PH-1.20,PH-1.21, PH-1.22,PH-1.23
PH-SDL-7	Serotonin-agonist/antagonist/role in Migraine	PH-1.16
PH SDL-8	Management of Typhoid	PH-1.42
PH-SDL-9	Management of Leprosy	PH-1.46
PH-SDL-10	Management of Obesity/ Hypolipidemic drugs	PH-1.31
PH-SDL-11	Chelating agent	PH-1.53
PH-SDL-12	Occupation/ Environmental Pollutants, Pesticides, Food adulteration	PH-1.51,PH-1.52

LIST OF SMALL GROUP TEACHING / PRACTICAL SCHEDULES - PHASE- II						
Sr. No	**Topic**	**Competency No.**	**Teaching learning method**	**Assessment method**	**Number required certify**	**Integration**
1	Introduction to practical (Instruments, animal)					
2	Oral dosage form	PH-2.1, PH-1.3	DOAP	Skill Assessment		
3	Parenteral dosage form	PH-2.1, PH-1.3	DOAP	Skill Assessment		
4	Topical dosage forms	PH-2.1, 1.3	DOAP	Skill Assessment		
5	Administrate of drugs through various routes in simulated environment using (Mannequins)	PH-4.1	DOAP	Skill Assessment		
6	Preparation of ORS and Explain use	PH-2.2	DOAP	Skill Assessment		
7	Describe setting of IV drip in simulated environment	PH-2.3	DOAP	Skill Assessment		
8	Calculation of drug dosage in patients in special situations	PH-2.4, PH-1.12	DOAP	Skill Assessment		V.I- Paediatrics /Medicine
9	Pharmacokinetics (graphical representation, Disintegration, Dissolution)	PH-1.4	Skill Lab	Skill station		
10	Pharmaco dynamic (DRC agonist, antagonist potentiation, graphical representation	PH-1.5	Skill Lab	Skill station		
11	Rational prescription (correct complete legible generic prescription for given condition)	PH-3.1 PH-1.10	Skill station	Skill station Maintain logbook	05	V.I- Medicine
12	Prescription audit (identify errors in given prescription and rewrite prescription) with legal and ethical aspect of prescribing drug	PH-3.2, PH 3.3, PH- 5.7	Skill Lab	Maintain logbook	03	
13	Critical evaluation of drug Promotional literature	PH-3.3	Skill Lab	Skill station Maintain logbook	03	V.I- Medicine
14	Spots- Ist		Skill station			
15	Prescription writing – Ist		Skills			
16	Rewriting Prescription – Ist		Skills			

17	F.D.C- Ist		Skills			
18	ADR reporting and Pharmaco vigilance and Filling ADR form	PH-3.4	Skill station	Skill station Maintain logbook		
19	To prepare and explain list of P-drug for given condition	PH-3.5	Skill station	Maintain logbook	03	V-I Medicine
20	Interaction with pharmaceutical representative to get authentic information of drug	PH-3.6	Skill station	Maintain logbook		
21	Prepare a list of Essential medicines for a health care facility drug concept	PH-3.7, PH-1.59	Skill station	Maintain logbook		
22	Communication with patient for proper use of prescribed medication and antibiotic stewardship programme.	PH-3.8,1.43	Skill Lab	Skill station		
23	Antibiotic steward programme					
24	Demonstration of effects of drugs on Blood pressures	PH-4.2	CBL	Skill station		
25	Screening techniques -I		CBL	Skill station		
26	Screening techniques -II		CBL	Skill station		
27	Case study – I (O.P. poisoning)		Small group discussion	Viva-Voce		
28	Case study – II (perioperative management)		Small group	Viva voce		
29	Communication with patient with empathy and ethic on all aspect of drug use and motivate patient with chronic diseases to adhere to prescribed the management.	PH-5.1 + PH-5.3	Small group discussion	Skill patients		V.I/ Medicine
30	Community with patient with regarding optimal use of a) Drug therapy, b) Devices storage of Medicine	PH-5.2	Small group discussion	Skill patient		
31	Explain to patients the relation - ship between cost of treatment and patient compliance	PH-5.4	Small group discussion	Viva - voce		V.I- Medicine
32	Spots- IInd		Skill station			

33	Prescription writing – IInd		Skills			
34	Rewriting Prescription – IInd		Skills			
35	F.D.C- IInd		Skills			
36	Spots – III rd		Small group	Viva voce		
37	Prescription writing -IIIrd		Small group	Viva voce		
38	rewrite prescription- IIIrd		Small group	Viva voce		
39	FDC-IIIrd		Small group	Viva voce		

LIST OF DOAP SESSIONS SCHEDULES - PHASE- II						
Sr. No	**Topic**	**Competency No.**	**Teaching learning method**	**Assessment method**	**Number required certify**	**Integration**
1	Oral dosage form	PH-2.1	DOAP	Skill Assessment		
2	Parenteral dosage form	PH-2.1	DOAP	Skill Assessment		
3	Topical dosage forms	PH-2.1	DOAP	Skill Assessment		
4	Administrate of drugs through various routes in simulated environment using (Mannequins)	PH-4.1	DOAP	Skill Assessment		
5	Preparation of ORS and Explain use	PH-2.2	DOAP	Skill Assessment		
6	Describe setting of IV drip in simulated environment	PH-2.3	DOAP	Skill Assessment		
7	Calculation of drug dosage in patients in special situations	PH-2.4	DOAP	Skill Assessment		V.I- Pediatrics /Medicine

	LIST OF PANDEMIC MODULE -SCHEDULES - PHASE- II (6 hours)			
No	**Topic**	**Competency No.**	**Teaching learning method**	**Assessment method**
1	Therapeutic Strategies including New Drug Development	PH-2.5	Lecture / SGT	Formative Assessment & Viva voce

LIST OF AETCOM MODULE -SCHEDULES - PHASE- II (9hours)				
No	Topic	Competency No.	Teaching learning method	Assessment method
1	The foundations of communication	PH 2.1	Lecture SGT (AV method)	Formative Assessment & Viva voce
2	Foundation of Bioethics	PH 2.2	Lecture	Formative & Summative Assessment
3	Health care as a right	PH 2.5	Lecture	Formative Assessment & Viva voce

TERM WISE TOPIC DISTRIBUTION	
First Internal Assessment Examination-Syllabus	
Topics	
1. General Pharmacology including Drug Interactions 2. New drug delivery system & New drug development 3. Drugs used in pregnancy, at extremes of age & in organ dysfunction 4. Pharmacovigilance	1. Blood 2. Autonomic Nervous system 3. Skeletal Muscle Relaxants 4. Glaucoma & Ocular Pharmacology

Second Internal Assessment Examination – Syllabus	
Topics	
1. Cardiovascular system 2. Diuretics 3. Gastrointestinal system 4. AETCOM	5. Central Nervous System 6. Parkinsonism 7. Respiratory system 8. Autocoids

Third Internal Assessment(Preliminary Examination)& University Examination –- Syllabus	
Paper I	
Topics	
1. General Pharmacology including Drug Interactions 2. New drug delivery system & New drug development 3. Drugs used in pregnancy, at extremes of age & in organ dysfunction 4. Pharmacovigilance 5. AETCOM	6. Autonomic Nervous system 7. Skeletal Muscle Relaxants 8. Glaucoma & Ocular Pharmacology 9. Respiratory system 10. Autocoids
Paper II	
Topics	
1. Cardiovascular system 2. Diuretics 3. Blood 4. Gastrointestinal system 5. Endocrinology including drugs acting on uterus 6. Vitamins 7. Diagnostic & chelating agents	8. Central Nervous System 9. Parkinsonism 10. Chemotherapy including cancer chemotherapy 11. Drugs in Dermatology 12. Immunomodulators & Gene therapy 13. Vaccines & Sera 14. Environmental & Occupational Pollutants

NATURE OF THEORY EXAMINATION PAPER

THEORY PAPER PATTERN – I ST TERM ENDING				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	MCQs- Multiple choice questions	20	1 mark each	20 marks
Section – B	SAQs- Structured short answer questions	12 (Out of 13)	5 marks each	60 marks
Section – C	LAQs- Structured long answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

THEORY PAPER PATTERN – II ND TERM ENDING				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	MCQs- Multiple choice questions	20	1 mark each	20 marks
Section – B	SAQs- Structured short answer questions	One AETCOM question (compulsory)	5 marks	5 marks
		11 (Out of 12)	5 marks each	55 marks
Section – C	LAQs-Structured long answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

THEORY PAPER PATTERN – PRELIMINARY & UNIVERSITY EXAM PAPER – I				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	MCQs- Multiple choice questions	20	1 mark each	20 marks
Section – B	SAQs-Structured short answer questions	One AETCOM question (compulsory)	5 marks	5 marks
		11 (Out of 12)	5 marks each	55 marks
Section – C	LAQs- Structured long answered questions	2 (Out of 3)	10 marks each	20 marks
			Total	**100 marks**

THEORY PAPER PATTERN – PRELIMINARY &UNIVERSITYEXAM PAPER – II				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	MCQs- Multiple choice questions	20	1 mark each	20 marks
Section – B	SAQs-Structured short answer questions	12 (Out of 13)	5 marks each	60 marks
Section – C	LAQs-Structured long answer questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

NATURE OF PRACTICAL EXAMINATION PAPER

Practical Examination Pattern (First, Second Internal Assessment &Preliminary Examination)										
Practical						Oral/Viva				Total
Seat No.	Clinical Pharmacy	Clinical Pharmacology	Experimental Pharmacology	Communication	Total	VIVA 1	VIVA II	Log Book Journal	Total	**Practical & Oral (E + H)**
	20	30	10	10	70	10	10	10	30	**100**

Practical Ist Internal assessment / II nd Internal Assessment / Preliminary Examinations			
Clinical Pharmacy	20 marks	Dosage form + New drug Delivery system	10 marks
		ORS preparation	5 marks
		Dose calculation	5 marks
Clinical Pharmacology	30 marks	Prescription writing	10 marks
		Criticism & Rewrite	5 marks
		FDC	5 marks
		ADR identification / ADR reporting	5 marks
		P- Drug list	5 marks
Experimental Pharmacology/ OSPE	10 marks	Drug administration using mannequin / Drug effect using CAL software	10 marks
Communication OSPE	10 marks	Prescription communication / ethics- legal drug storage/ use of device/drug adherence-compliance/ drug dependence/OTC/ interaction with medical representative/ / IV drip setting/ MDI/ Promotional Drug Literature	10 marks
Log Book + Journal	10 Marks		10 marks
Viva	30 marks	Viva I	10 marks
		Viva II	10 marks
Total			100 Marks

Practical University Examinations Pattern			
Clinical Pharmacy	20 marks	Dosage form + New drug Delivery system	10 marks
		ORS preparation	5 marks
		Dose calculation	5 marks
Clinical Pharmacology	30 marks	Prescription writing	10 marks
		Criticism & Rewrite	5 marks
		FDC	5 marks
		ADR identification / ADR reporting	5 marks
		P- Drug list	5 marks
Experimental Pharmacology OSPE	10 marks	Drug administration using mannequin / Drug effect using CAL software	10 marks
Communication OSPE	10 marks	Prescription communication / ethics- legal drug storage/ use of device/drug adherence-compliance/ drug dependence/OTC/ interaction with medical representative/ / IV drip setting/ MDI/ Promotional Drug Literature	10 marks
Viva	30 marks	Viva I	*15 marks*
		Viva II	*15 marks*
Total			***100 Marks***

INTERNAL ASSESSMENT

Phase	**I-Exam (June)**			**II-Exam (September)**			**Prelim (December)**		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical (Including 10 Marks for Journal & Log Book)	**Total Marks**	Theory	Practical	Total Marks
Second MBBS	100	100	200	100	100	200	Paper I -100 Paper II -100	100	300

1. **Eligibility criteria:**
    a. There will be **3 internal assessment examinations** in Pharmacology. The structure of the internal assessment theory examinations should be similar to the structure of University examinations.
    b. It is **mandatory for the students to appear for all the internal assessment examinations.**
    c. First internal assessment examination will be held in June, second internal assessment examination will be held in September and third internal assessment examination will be held in December.
    d. **A student who has not taken minimum required number of marks for Internal Assessment each in theory and practical will not be eligible for University examinations.**
    e. There will be **only one additional examination for absent students (due to genuine reason) after approval by the Institutional Grievances Committee.** It should be taken after preliminary examination and before submission of internal assessment marks to the University.
    f. Internal assessment marks for theory will be out of 400 and practical will be out of 300.
    g. Reduce total theory internal assessment to 40 marks and total practical internal assessment to 40 marks. Students must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) to be eligible for appearing University examination.

2. **Passing criteria :**
    a. **Complete passing in phase I examination** is compulsory before proceeding to phase II.
    b. A student who fails in the **second year course examination should not be allowed to appear for III phase examination** unless he /she passes all the subjects of second year course.
    c. The students must secure at least 50 % marks of total marks (combined theory & practical /clinical) and not less than **40 % marks in theory and practical separately** assigned for particular internal assessment.
    d. **Additional Internal assessment** examination for non-eligible students (less than 50 % combined in theory and practical or 40% separately)will be conducted after prelims and before submission of internal assessment marks.
    e. **Student who will not be eligible after additional internal examination will appear with next regular batch as repeater student.**

3. **Supplementary examination**

Supplementary examination should be conducted within 4- 6 weeks after University result.

1. **Conversion Formula for calculation of marks in internal assessment examinations.**

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% separately in Theory & Practical, 50% Combined)	
Theory	100	100	200	400	Total marks obtained (Divide by10)	16 (Minimum)	Total of Theory + Practical Must be 40.
Practical	100	100	100	300	Total marks obtained (Divide by7.5)	16 (Minimum)	

2. **While preparing Final Marks of Internal Assessment, the rounding-off marks shall do as illustrated in following table**

Internal Assessment Marks	Final rounded marks
15.01 to 15.49	15
15.01 to 15.49	16

3. Internal assessment marks will reflect as separate head of passing at the summative examination.
4. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

LEARNING RESOURCE MATERIAL BOOKS

Textbooks Recommended:

1. Basic & Clinical Pharmacology. Katzung BG (Ed), Publisher: Prentice Hall International Ltd., London.
2. Pharmacology & Pharmacotherapeutics. Satoskar RS, Bhandarkar SD (Ed), Publisher: Popular Prakashan, Bombay.
3. Essentials of Medical Pharmacology. Tripathi KD (Ed), Jaypee Brothers, publisher : Medical Publishers (P) Ltd.
4. Clinical Pharmacology. Laurence DR, Bennet PN, Brown MJ (Ed). Publisher: Churchill Livingstone

Reference books:

1. Goodman & Gilman's The Pharmacological Basis of Therapeutics. Hardman JG & Limbird LE (Ed), Publisher: McGraw-Hill, New York.
2. A Textbook of Clinical Pharmacology. Roger HJ, Spector RG, Trounce JR (Ed), Publisher: Hodder and Stoughton Publishers.

PATHOLOGY

Vision

- To become a world class dynamic institution of education, research and training to develop globally competitive professional and socially responsible human resource.

Mission

- To ensure globally relevant quality higher education and skill enhancement for providing required trained manpower to the nation & the world.
- To promote symbiotic relations with industry, academic & research institutions and community to meet the expectations of various stakeholders.
- To engage in interdisciplinary research and innovate for furtherance of knowledge, technology and growth.
- To put in place dynamic technocracy for effective use of emerging trends in curriculum development, andragogy, evaluation and system management.
- To provide an environment for holistic evolution of the learners as human, socially responsible and conscious of sustainable ecosystem.

Educational objectives

Knowledge

At the end of one year, the student shall be able to -

I. Describe the structure and ultra-structure of a sick cell, the mechanisms of the cell degradation, cell death and repair.
II. Correlate structural and functional alterations in the sick cell.
III. Explain the Patho physiological processes which governs the maintenance of homeostasis, mechanism of their disturbances and the morphological and clinical manifestation associated with it.
IV. Describe the mechanisms and patterns of tissue response to injury to appreciate the Patho physiology of disease processes and their clinical manifestations.
V. Correlate the gross and microscopic alterations of different organ systems in common diseases to the extent needed to understand disease processes and their clinical significance.
VI. Develop an understanding of neoplastic change in the body in order to appreciate need for early diagnosis and further management of neoplasia.
VII. Understand mechanisms of common haematological disorders and develop a logical approach in their diagnosis and management.

Skills

At the end of one year, the student shall be able to -

I. Describe the rationale and principles of technical procedures of diagnostic laboratory tests.
II. Interpret diagnostic laboratory tests and correlate with clinical and morphological features of diseases.
III. Perform simple bedside tests on blood, urine and other biological fluid samples.
IV. Draw a rational scheme of investigations aimed at diagnosing and managing common disorders.
V. Recognise morbid anatomical and histopathological changes for the diagnosis of common disorders.

Integration

At the end of one year, the student shall be able to integrate the causes and mechanisms of disease most prevalent in India with their natural history for the understanding of their clinical course and management

Programme Outcomes

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

1. Graduate Attributes: Medical and Scientific Knowledge.

PO 1 :

- Demonstrate knowledge of normal and abnormal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge about established and evolving biomedical and clinical sciences.
- 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. Graduate Attributes: Planning Patient Care and problem solving abilities

PO 2:

- Demonstrate ability to apply this knowledge to the practice of medicine in routine, emergency and disaster situations.
- Demonstrate ability to appraise and assimilate scientific evidence into their own ongoing learning, research, and patient care.
- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to provide evidence-based care that is compassionate, respectful of patients' differences, values, and preferences.

3. Graduate Attributes: Professional excellence & Ethics

PO 3:

- Demonstrate commitment to the highest standards of professional responsibility towards patient, colleagues, society, growth of medical professional and adhere to universally accepted code of ethics.
- Demonstrate personal attributes of compassion, honesty, integrity, accountability, empathy in patient encounters.

4. Graduate Attributes: Communication Skills.

PO 4:

- Demonstrate ability to communicate effectively, respectfully, non-judgemental, empathetic manner with patients, their families and colleagues that will improve patient satisfaction ,health care and encourages participation and shared decision-making.
- Demonstrate the ability to listen clearly, inform, communicate and educate patients &/ caregivers for the promotion of health, diagnosis of disease and the treatment of illness; advocate for disease prevention, wellness and the promotion of healthy lifestyles including a focus on population health

5. Graduate attributes: Leader & Member of the health care team & System

PO 5:

- Demonstrate the ability to work effectively, efficiently & in rational way with his/ her colleagues and other team members, educate & motivate the team members in a manner to maximize the health delivery potential of the team, considering various roles, responsibilities and competencies of the other health professionals.
- Identify the self- potential, functioning ability as a team leader in primary and secondary health care settings, utilize various indicators of the health care system and to promote appropriate, low cost, ethical, fair and qualitative health delivery.

6. Graduate attributes : Life long learner

PO 6:

- Demonstrate ability to acquire new knowledge, skills and reflect upon their experience to enhance personal and professional growth and apply the information in the care of the patient.
- Demonstrate self-motivation and awareness to their own limitations.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

7. Graduate attributes: Research Aptitude

PO7:

- Demonstrate an attitude of inquiry/search/investigation ,scientific and objective effort to uncover facts**.**

8. Graduate attributes: Societal Responsibilities

PO8 :

- Demonstrate accountability in fulfilling their duty for the benefit of the entire society.

9. Graduate attributes: Awareness towards Environment and sustainability

PO9 :

- Demonstrates responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future.

Course Outcome

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

CO1. Comprehension of the causes, evolution and mechanism of diseases. Ability to correlate the natural history, structural and functional changes with the clinical manifestation of diseases, their diagnosis and therapy.

CO2. Describe the basic pathological processes in terms of pathogenesis and morphological changes in tissues. Correlate the morphological alterations of different organ systems in non-neoplastic and neoplastic disorders to the extent needed to understand disease processes, their clinical significance, appreciate need for early diagnosis and further management of diseases.

CO3.understand mechanism of common hematological disorders and develop a logical approach in their diagnosis and management. Describe the rationale and principles of technical procedures of diagnostic laboratory tests. Interpret diagnostic laboratory tests and correlate with clinical and morphological features of diseases.

CO4. Demonstrate commitment towards the patient, colleagues, society and adhere to universally accepted code of ethics. Respect and maintain professional boundaries between patients',colleagues and society.

CO5.Demonstrate ability to communicate effectively, respectfully, non-judgmental, empathetic manner with patients, their families and colleagues that will improve patient satisfaction in a simulated environment. Demonstrate ability to work in a team of peers and superiors. Demonstrate respect in relationship with fellow team members, superiors and other health care workers.

CO6. Demonstrate an ability to perform an objective self- assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills. Demonstrate ability to search (including through electronic means), and critically evaluate medical literature and apply the information in the diagnosis of the disease and patient care. Describe and discuss the commitment to lifelong learning as an important part of professional growth.

Goal

The goal of teaching pathology is to provide undergraduate students comprehensive knowledge of the causes and mechanisms of disease, in order to enable them to achieve complete understanding of the natural history and clinical manifestations of the disease.

2. Educational objectives

(a) Knowledge

At the end of one year, the student shall be able to -

VIII. Describe the structure and ultra-structure of a sick cell, the mechanisms of the cell degradation, cell death and repair.

IX. Correlate structural and functional alterations in the sick cell.

X. Explain the Patho physiological processes which governs the maintenance of homeostasis, mechanism of their disturbances and the morphological and clinical manifestation associated with it.

XI. Describe the mechanisms and patterns of tissue response to injury to appreciate the Patho physiology of disease processes and their clinical manifestations.

XII. Correlate the gross and microscopic alterations of different organ systems in common diseases to the extent needed to understand disease processes and their clinical significance.

XIII. Develop an understanding of neoplastic change in the body in order to appreciate need for early diagnosis and further management of neoplasia.

XIV. Understand mechanisms of common haematological disorders and develop a logical approach in their diagnosis and management.

(b) Skills

At the end of one year, the student shall be able to -

VI. Describe the rationale and principles of technical procedures of diagnostic laboratory tests.

VII. Interpret diagnostic laboratory tests and correlate with clinical and morphological features of diseases.

VIII. Perform simple bedside tests on blood, urine and other biological fluid samples.

IX. Draw a rational scheme of investigations aimed at diagnosing and managing common disorders.

X. Recognise morbid anatomical and histopathological changes for the diagnosis of common disorders.

(c) Integration

At the end of one year, the student shall be able to integrate the causes and mechanisms of disease most prevalent in India with their natural history for the understanding of their clinical course and management.

3. **Total duration of teaching** 2 Semesters (III and IV)
Minimum 315 working days.

Total number of teaching hours allotted to the discipline **230 hrs**

Distribution of teaching hours

A. Theory (Interactive lectures) 80
B. Practicals/ SGD/ Seminar 138
C. SDL 12

Course Content
Second MBBS (From MARCH 2021)
Subject: PATHOLOGY Theory / Practical

Based on ***National Medical Commission***, **Competency based Undergraduate curriculum for the Indian Medical Graduate,**

1. Total Teaching hours: 230

2. A. Lectures(hours):**80**

B. Self-directed learning (hours) : - **12**

C. Clinical Postings (Hours) : **NA**

D. Small group teachings/tutorials/Integrated teaching/Practical (hours) : **138**

Competency Nos.	Topics & Subtopics	Lecture	SGT/ DOAP/ Tutorial/ IT /Seminar	SDL
		80 hours	138 hours	12 hours
PA1.1–1.3	**Introduction to Pathology** *Core*: common definitions and terms, role of pathologist, branches of pathology Practical: histological techniques, working of amicro scope *Non-core*: history and evolution of pathology	1	2	
PA2.1–2.8	**Cell injury and adaptations** *Core*:Cellinjury,necrosis,apoptosis,intracellularaccumulations,celldeath,cellularadaptations,calcification,disordersofpigmentmetabolism,*Non-core*:cellularaging	4	5	2
PA3.1-3.2	**Amyloidosis-** *Core*: Pathogenesis and pathology of amyloidosis	1	2	
PA4.1–4.4	**Inflammation** *Core*: Acute and chronic inflammation, mediators of inflammation, granulomatous inflammation, including TB	3	3	
PA5.1	**Healing and repair-***Core*: Repair and wound healing	1	1	
PA6.1-6.7	**Hemodynamic disorders** *Core*:Edema,hyperemia,congestion,hemorrhage,shock,thrombosis,embolism,ischemia,infarction	4	4	1
PA7.1-7.5	**Neoplasia** *Core*: Definition and classification of neoplasia, molecular basis of cancer, carcinogenesis, effects of tumour on host, paraneoplastic syndrome, laboratory diagnosis of cancer *Non-core*: Immunology and immune response to cancer	4	6	
PA8.1-8.3	**Basic diagnostic cytology** *Core*: Diagnostic role of cytology, exfoliative cytology	1	4	
PA9.1-9.7	**Immuno pathology** *Core*: Principles of immunity, hypersensitivity reactions, HLA system, transplant rejection, autoimmunity, systemic lupusery the matosus, pathology of HIV/AIDS	4	-	

PA10.1-10.4	**Infections and infestations-** *Core*:Malaria,cysticercus,leprosy,*Non-core:*Commonbacterial,viral,protozoal,andhelminthicdiseases	1	1	1
PA11.1-11.3	**Genetic and pediatric diseases-** *Non-core*: Mutations, Tumors and tumour-like conditions of infancy and childhood, common storage disorders	-	1	
PA12.1-12.3	**Environmental and nutritional disease** *Core*: Airpollution, tobacco, alcohol, protein caloriemal nutrition, starvation, obesity	2	1	
PA13.1-13.5	**Introduction to hematology** *Core*: Hematopoies is and extra medullary hematopoiesis, definition and classification of anemia, anticoagulants, Investigations in anemia, peripheralsmear examination	1	8	
PA14.1-14.3	**Microcyticanemia-** *Core*: Ironmetabolism, microcytic Hypochromic anemia, peripheralsmear in microcytic anemia	1	4	
PA15.1-15.4	**Macrocytic anemia** *Core*:VitaminB12metabolism.Etiologyandpathogenesisof B12deficiency,laboratoryinvestigationsinmacrocyticanemia,megaloblastic anemia *Non-core:* differences between megaloblastic and non-Megaloblastic anemia	1	4	
PA16.1-16.7	**Hemolytic anemia** *Core:* Definition and classification of hemolytic anemia, pathogenesis, features, hematological indices, sickle cell anemia, thalassemia, peripheralsmear picture in hemolytic anemia, classification, clinical features of hemolytic anemia	2	6	1
PA17.1-17.2	**Aplastic anemia-***Non-core*: Etiology, pathogenesis, findings, bone marrow aspiration and biopsy		-	
PA18.1-18.2	**Leukocyte disorders** *Core :* Leukocytosis, leukopenia, acute and chronic leukemia	2	5	1
PA19.1-19.7	**Lymphnode and spleen** *Core:* Lymphade no pathy, TB lymphadenitis, Hodgkin's disease, non-Hodgkin's lymphoma, splenomegaly	2	4	1
PA20.1	**Plasma cell disorders-** *Core:* Multiple myeloma	1	1	
PA21.1-21.5	**Hemorrhagic disorders** *Core:* Normal hemostasis, vascular and platelet disorders, ITP, hemophilia, clotting disorders, DIC, Vitamin K deficiency	2	-	
PA22.1-22.7	**Blood banking and transfusion** *Core:* Blood group systems, compatibility testing, blood components, trans fusion transmitted infections, transfusion reactions, auto logous transfusion	2	4	
PA23.1-23.3	**Clinical Pathology** *Core*: Urine analysis, Body fluids, semen analysis ,thyroid function tests, renal function tests, liver function tests	-	12	

PA24.1-24.7	**Gastro intestinaltract:-***Core*: Etiology, pathogenesis, pathology, morphology and clinical features of: oral cancer,	5	4	
	Pepticulcer disease, polyp, carcinomas tomach, tubercular intestine, inflammatory bowel disease, carcinomacolon			
PA25.1-25.6	**Hepatobiliary system:** *Core*: Bilirubinmeta bolism, etio pathogenesis and classification of jaundice, hepatic failure, pathology, complications, consequences and laboratory diagnosis of viral hepatitis; patho physiology of alcoholic liver disease and cirrhosis; portal hypertension;hepatocellularcarcinomaInterpretationofliverfunctiontests;Serologypanelinviral hepatitis(small group)	3	5	
PA26.1-26.7	**Respiratory system:** *Core*: Etio patho genesis, morphology, and complications of: pneumonia,lungabscess,chronicobstructiveairwaydisease,bronchiectasis,tuberculosis,occupationallungdisease,lung tumours, *Non-core*: pleural tumours, mesothelioma	5	4	1
PA27.1-27.10	**Cardiovascular system:** *Core*: Arteriosclerosis, aneurysm, heart failure, is chemiche art disease, laboratory diagnosis of acute coronary syndrome, rheumatic fever and heart disease, infective end ocarditis, pericarditis, pericardial effusion, *Non-core*: cardio my opathies,	3	4	1
PA28.1-28.16	**Urinary tract** *Core*: Histology of kidney, clinical syndromes, acute renal failure, chronicrenal failure, acute glomerulonephritis, glomerular manifestations in systemic disease ,diseases of tubular interstitium, acute tubular necrosis, acute and chronic pyelonephritis, reflux nephropathy, vascular diseases of kidney, cystic diseases of kidney, urinary calculi and obstructive uropathy, renaltumours *Non-core* :thrombotic angiopathies, urothelialtumours	9	4	
PA29.1-29.5	**Malegenital tract:** *Core*: Testicular tumours, carcinomapenis, being prostatichyperplasia, carcinomaprostate, *Non-core*: prostatitis	2	4	
PA30.1-30.9	**Femalegenitaltract:** *Core*: Pathogenesis, etiology, pathology, diagnosis, and progression of: carcinomacervix, carcinoma endometrium, leiomyoma, leiomyosarcoma, ovariantumours,gestationaltrophoblasticneoplasms,*Non-core*:cervicitis,endometriosis, adenomyosis, end ometrial hyperplasia	3	4	1
PA31.1-31.4	**Breast-** *Core*: Benign breast disease, carcinoma breast, *Non-core*: gyne comastia	2	2	

PA32.1-32.9	**Endo crine system** *Core*: etiology, pathogenesis, pathology and iodine Dependency of: goiters, thyro toxicos is, hypert hyroidism,	4	4	
	hypothyroidism; epidemiology, etio pathogenesis, pathology, laboratory diagnosis, complications of diabetes mellitus Non-core: hyperparathyroidism, pancreatic cancer, adrenal insufficiency, Cushing syndrome, adrenal neoplasms			
PA33.1-33.5	Bone and soft tissue Core: Osteomyelitis, bone tumours, soft tissue tumors Non-core: Rheumatoid arthritis, Paget's disease of bone	3	4	1
PA34.1-34.4	Skin Core: Squamous cell carcinoma, basal cell carcinoma Non-core: Nevus, melanoma,	1	4	
PA35.1-35.3	Central nervous system Core: CSF findings in meningitis, CNS tumours	2	4	
PA36.1	Eye- Non-core: Retinoblastoma	-		1
	Charts and instruments		6	
	Revision & journal correction		8	

AETCOM

AETCOM2.4	**Working in a health care team**		6	
AETCOM2.8	**What does it mean to be family member of a sick patient?**		6	

LIST OF DIDACTIC LECTURE SCHEDULE - PHASE- II

Sr. No	COMPETENCY The student should be able to	Competency No.	Integration
Topic : Introduction to Pathology (1)			
1.	• Describe the role of a pathologist in diagnosis and management of disease. • Enumerate common definitions and terms used in Pathology • Describe the history and evolution of Pathology. • Histotechniques	1.1 - 1.3	
Topic: Cell Injury and Adaptation (4)			
2.	• Demonstrate knowledge of the causes, mechanisms, types and effects of cell injury and their clinical significance. • Describe the etiology of cell injury. Distinguish between reversible-irreversible injury: mechanisms; morphology of cell injury	2.1, 2.2	
3.	• Intracellular accumulation of fats, proteins, carbohydrates.	2.3	
4.	• Describe and discuss Cell death- types, mechanisms, necrosis, apoptosis (basic as contrasted with necrosis), autolysis. • Describe and discuss gangrene	2.4, 2.5	
5.	• Intracellular accumulation, pigments. • Describe and discuss pathologic calcifications	2.3, 2.5	
SDL-1	• Describe and discuss the mechanisms of cellular aging and Apoptosis	2.7	
Topic: Inflammation (3)			
6.	• Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events	4.1	Vert int SU
7.	• Enumerate and describe the mediators of acute inflammation	4.2	Vert int SU
8.	• Define and describe chronic inflammation including causes, types non-specific and granulomatous; and enumerate types, non-specific and granulomatous; and enumerate examples of each	4.3	
Topic: Healing and repair (1)			
9.	• Define and describe the process of repair and regeneration including wound healing and its types	5.1	Vert int SU
Topic: Hemodynamic disorders (4)			
10.	• Define and describe edema, its types, pathogenesis and clinical correlations.	6.1	Vert int SU
SDL-2	• Define and describe hyperemia, congestion, hemorrhage.	6.2	
11.	• Define and describe shock, its pathogenesis and its stages	6.3	Vert int SU
12.	• Define and describe normal haemostasis and the etiopathogenesis and consequences of thrombosis •	6.4	
13.	• Define and describe embolism and its causes and common types • Define and describe Ischaemia/ infarction its types, etiology, morphologic changes and clinical effects	6.5, 6.6	
Topic: Neoplastic disorders (4)			
SDL-3	• Describe and discuss cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia	2.6	

14.	• Define and classify neoplasia. Describe the characteristics of neoplasia including gross, microscopy, biologic, behaviour and spread. Differentiate between benign from malignant neoplasm	7.1	
15.	• Describe the molecular basis of cancer	7.2	
16.	• Enumerate carcinogens and describe the process of carcinogenesis • Describe the effects of tumor on the host including paraneoplastic syndrome • Describe immunology and immune response to cancer	7.3 7.4 7.5	Horizontal Int MI (7.5)
17.	• Metastasis and laboratory diagnosis of Neoplasm		
Topic: Immunopathology and AIDS (4)			
18.	• Describe the principles and mechanisms involved in immunity • Describe the mechanism of hypersensitivity reactions	9.1,9.2	Vert Int PE Horizontal Int MI
19.	• Define autoimmunity. Enumerate autoimmune disorders • Define and describe the pathogenesis of systemic Lupus Erythematosus • Define and describe the pathogenesis of other common autoimmune diseases	9.4,9.5,9.7	Vert Int IM
Topic: Amyloidosis (1)			
20.	• Describe the pathogenesis and pathology of amyloidosis	3.1	
Topic: Immunopathology and AIDS (continued)			
21.	• Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection	9.3	Horizontal Int MI
22.	• Define and describe the pathogenesis and pathology of HIV and AIDS	9.6	Vert Int IM
Topic: Infection and Infestations (1)			
Seminar 1	• Define and describe the pathogenesis and pathology of malaria	10.1	Vert Int IM Horizontal Int MI
23.	• Define and describe the pathogenesis and pathology of leprosy	10.3	Vertical Int IM Horizontal Int MI
SDL-4	• Define and describe the pathogenesis and pathology of cysticercosis • Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases.	10.2, 10.4	Vertical Int IM Horizontal Int MI
Topic: Genetic and paediatric diseases (0)			
Seminar 2	• Describe the pathogenesis and features of common cytogenetic abnormalities and mutations in childhood • Describe the pathogenesis of common storage disorders in infancy and childhood.	11.1, 11.3	Vert Int PE
Seminar 3	• Describe the pathogenesis and pathology of tumor and tumour- like conditions in infancy and childhood	11.2	Vert Int PE
Topic: Environmental and nutritional diseases (2)			
24.	• Enumerate and describe the pathogenesis of disorders caused by air pollution, tobacco and alcohol	12.1	Horizontal Int CM
Seminar 4	• Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	12.2	Vert Int BI, PE

25.	• Describe the pathogenesis of obesity and its consequences	12.3	Vert Int IM
Topic: Introduction to haematology (1)			
26.	• Define and classify anemia • Enumerate and describe the investigation of anemia	13.3, 13.4	Vert Int IM
Topic: Microcytic anemia (1)			
27.	• Describe iron metabolism	14.1	Vert Int BI
	• Describe the etiology, investigations and differential diagnosis of microcytic hypochromic anemia	14.2	Vert Int IM
Topic: Macrocytic anemia (1)			
28.	• Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	15.1	Vert Int BI, IM
	• Describe laboratory investigations of macrocytic anemia • Enumerate the differences and describe the etiology and distinguishing features of megaloblastic and non-megaloblastic macrocytic anemia	15.2, 15.4	Vert Int IM
Topic: Hemolytic anemia and Aplastic anemia (2)			
29.	• Define and classify hemolytic anemia	16.1	Vert Int BI, IM
	• Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	16.2	Vert Int BI, IM
	• Enumerate the etiology, pathogenesis and findings in aplastic Anemia • Enumerate the indications and describe the findings in bone marrow aspiration and biopsy	17.1	Vertical Int IM
30.	• Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	16.3	Vert Int BI, IM
SDL-5	• Describe the etiology pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia • Describe the peripheral blood picture in different hemolytic anaemias	16.4, 16.5	Vert Int BI, IM
Topic: Leukocyte disorders (2)			
SDL-6	• Enumerate and describe the causes of leukocytosis leucopenia, lymphocytosis and leukemoid reactions (leukemoid reactions not included in seminar)	18.1	
31.	• Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia (only acute leukemia)	18.2 (I)	
32.	• Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia (only chronic leukemia) + leukemoid reactions	18.2 (II), 18.1	
Topic: Lymph node and spleen (2)			
33.	• Enumerate the causes and describe the differentiating features of lymphadenopathy • Describe the pathogenesis and pathology of tuberculous lymphadenitis	19.1, 19.2	Vert Int SU
34.	• Describe and discuss the pathogenesis, pathology and the differentiating features of Hodgkin's and non-Hodgkin's lymphoma	19.4	Vert Int SU
SDL-7	Enumerate and differentiate the causes of splenomegaly	19.6	Vertical Int IM, SU

35.	• Describe the features of plasma cell myeloma	20.1	
Topic: Hemorrhagic disorders (2)			
36.	• Describe normal hemostasis • Classify and describe the etiology, pathogenesis and pathology of vascular and platelet disorders including ITP and hemophilias • Differentiate platelet from clotting disorders based on the clinical and hematologic features	21.1, 21.2, 21.3	 Vert Int PE Vert Int IM
37.	• Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of disseminated intravascular coagulation • Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of vitamin K deficiency.	21.4, 21.5	Vert Int IM
Topic: Blood banking and transfusion (2)			
38.	• Enumerate blood components and describe their clinical uses	22.4,	Vert Int IM, SU
	• Enumerate and describe infections transmitted by blood transfusion	22.5	Horizontal Int MI
39.	• Describe the correct technique to perform the cross-match	16.7	
	• Describe transfusion reactions and enumerate the steps in the investigation of a transfusion reaction	22.6	Vert Int IM
	• Enumerate the indications and describe the principles and procedure of autologous transfusion	22.7	
Topic: Gastrointestinal tract (4)			
40.	• Describe the etiology, pathogenesis, pathology and clinical features of oral cancers	24.1	Vert Int DE
41.	• Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of peptic ulcer disease • Describe and identify the microscopic features of peptic ulcer	24.2, 24.3	Vert Int IM
42.	• Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine (Ulcers in intestine- TB, typhoid, amoebic)	24.5	Vert Int SU
	• Describe and etiology and pathogenesis and pathologic and distinguishing features of Inflammatory bowel disease	24.6	
43.	• Describe and etiology and pathogenesis and pathologic features of carcinoma of the stomach	24.4	Vert Int SU
	• Describe the etiology, pathogenesis, pathology and distinguishing features of carcinoma of the colon	24.7	
Topic: Hepatobiliary system (3)			
Seminar 5	• Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia • Describe the pathophysiology and pathologic changes seen in hepatic failure and their clinical manifestations, complications and consequences	25.1, 25.2	Vert Int BI, IM Vert Int SU, IM
44.	• Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	25.3	Vert Int IM

45.	• Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis	25.4	Vert Int SU, IM
46.	• Describe the etiology, pathogenesis and complications of portal hypertension **+ Tumors of Liver + Diseases of gall bladder**	25.5	Vert Int SU, IM
Topic: Respiratory system (5)			
47.	• Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	26.1	Vert Int IM, Horizontal Int MI
SDL-8	• Describe the etiology, gross and microscopic appearance and complications of lung abscess • Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	26.2	Vertical Int IM Horizontal Int MI
		26.7	Vertical Int IM, CM
48.	• Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	26.3	Vert Int IM, PY Horizontal Int MI
49.	• Define and describe the etiology, types, pathogenesis, stages, morphology microscopic appearance and complications of tuberculosis	26.4	Vert Int IM, Horizontal Int MI
50.	• Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	26.5	Vert Int IM, CM
51.	• Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, stages, morphology, microscopic appearance, metastases and complications of tumors of the lung and pleura	26.6	Vert Int IM
Topic: Cardiovascular system (3)			
52.	• Distinguish arteriosclerosis from atherosclerosis. Describe the pathogenesis and pathology of various causes and types of arteriosclerosis	27.1, 27.2	Vert Int IM
	• Describe the etiology, dynamics, pathology types and complications of aneurysms including aortic aneurysms • Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	27.10	Vert Int IM, Horizontal Int MI
53.	• Describe the etiology, types, stages pathophysiology, pathology and complications of heart failure	27.3	Vert Int IM, PY
	• Describe the epidemiology, risk factors, etiology, pathophysiology, pathology, presentations, gross and microscopic features, diagnostic tests and complications of ischemic heart disease	27.5	Vert Int IM
54.	• Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever • Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of infective endocarditis	27.4, 27.6	Vert Int IM, Horizontal Int MI

SDL-9	• Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of pericarditis and pericardial effusion	27.7	Vertical Int IM
	• Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	27.9	Vert Int IM, PY
Topic: Urinary Tract (9)			
55.	• Describe the normal histology of the kidney • Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	28.1	
		28.5	Vert Int IM, PY
56.	• Describe the etiology pathogenesis pathology laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	28.10	Vert Int SU, AN
57.	• Define classify and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features progression and complications of renal stone disease and obstructive uropathy	28.13	Vert Int SU
58.	• Enumerate and classify diseases affecting the tubular interstitium • Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of acute tubular necrosis.	28.8, 28.9	Vert Int IM
59.	• Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of IgA nephropathy • Enumerate and describe the findings in glomerular manifestations of systemic disease	28.6, 28.7	Vert Int IM
60.	• Define, classify and distinguish the clinical syndromes and describe the etiology, pathogenesis, pathology, morphology, clinical and laboratory and urinary findings, complications of renal failure	28.2,	
	• Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings, progression and complications of acute renal failure • Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings progression and complications of chronic renal failure	28.3, 28.4	Vert Int IM
61.	• Define classify and describe the etiology, pathogenesis pathology, laboratory, urinary findings, distinguishing features progression and complications of vascular disease of the kidney • Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of thrombotic angiopathies	28.11, 28.15	Vert Int IM
62.	• Define classify and describe the genetics, inheritance, etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney	28.12	Vert Int IM, PE
63.	• Classify and describe the etiology, genetics, pathogenesis, pathology, presenting features, progression and spread of renal tumors	28.14	Vert Int PE
	• Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors	28.16	Vertical Int SU

Topic: Male Genital Tract (2)			
64.	• Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors • Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	29.1, 29.2	Vert Int SU
65.	• Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, urologic findings & diagnostic tests of benign prostatic hyperplasia • Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate • Describe the etiology, pathogenesis, pathology and progression of prostatitis	29.3, 29.4, 29.5	Vert Int SU
Topic: Female Genital Tract (3)			
66.	• Describe the epidemiology, pathogenesis, etiology, pathology, screening, diagnosis and progression of carcinoma of the cervix • Describe the etiology and morphologic features of cervicitis	30.1, 30.6	Vert Int OG
67.	• Describe the etiology, hormonal dependence and morphology of endometrial hyperplasia • Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the endometrium • Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the leiomyomas and leiomyosarcomas	30.9, 30.2, 30.3	Vertical Int OG
SDL-10	• Describe the etiology, hormonal dependence, features and morphology of endometriosis • Describe the etiology and morphologic features of adenomyosis	30.7, 30.8	Vert Int OG
68.	• Classify and describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of ovarian tumors • Describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of gestational trophoblastic neoplasms	30.4, 30.5	Vert Int OG
Topic: Breast (2)			
69.	• Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	31.1	Vert Int AN, SU
	• Enumerate and describe the etiology, hormonal dependency and pathogenesis of gynecomastia	31.4	Vert Int IM, PE
70.	• Classify and describe the epidemiology, pathogenesis, classification, morphology, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast	31.2	Vert Int SU

Topic: Endocrine system (3)			
71.	• Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings • Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	32.1	Vert Int AN, PY, IM, SU
		32.2	Vert Int PY, IM
72.	• Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism • **Discuss the differential diagnosis of solitary thyroid nodule**	32.3	Vert Int PY, IM
73.	• Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	32.4	Vert Int PY, IM
Seminar 6	• Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	32.5	Vert Int PY, IM
	• Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	32.6	Vert Int SU
Seminar 7	• Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency • Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	32.7, 32.8	Vert Int PY, IM
Seminar 8	• Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	32.9	Vert Int AN, PY, IM, SU
Topic: Bone and soft tissue (3)			
74.	• Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis • Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone	33.1	Vert Int AN, OR Horizontal Int MI
		33.4	Vert Int OR
75.	• Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors	33.2	Vert Int OR
76.	• Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of soft tissue tumors	33.3	Vert Int OR
SDL-11	• Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	33.5	Vert Int IM

Topic: Skin (1)			
77.	• Describe the risk factors pathogenesis, pathology and natural history of squamous cell carcinoma of the skin • Describe the risk factors pathogenesis, pathology and natural history of basal cell carcinoma of the skin • Describe the distinguishing features between a nevus and melanoma. Describe the etiology, pathogenesis, risk factors morphology clinical features and metastases of melanoma	34.1, 34.2, 34.3	Vert Int DR
Topic: Central Nervous System (1)			
78.	• Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis • Classify and describe the etiology, genetics, pathogenesis, pathology, presentation sequelae and complications of CNS tumors	35.1	Vert Int IM, Horizontal Int MI
		35.2	Vert Int PE
Topic: Eye			
SDL-12	• Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	36.1	Vertical Int OP
Topic: Basic Diagnostic Cytology (1)			
79.	• Describe the diagnostic role of cytology and its application in clinical care. • Describe the basis of exfoliative cytology including the technique & stains used.	8.1,8.2	Vert Int SU
Topic : Clinical Pathology (1)			
80.	• Describe abnormal findings in body fluids in various disease states • CSF findings in meningitis	23.2, 35.1	

SELF-DIRECTED LEARNING – SDL			
Sr. No	**COMPETENCY**	**Competency No.**	**Integration**
PA-SDL-1	• Describe and discuss the mechanisms of cellular aging and Apoptosis	2.7	
PA-SDL-2	• Define and describe hyperemia, congestion, hemorrhage.	6.2	
PA-SDL-3	• Describe and discuss cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia	2.6	
PA-SDL-4	• Define and describe the pathogenesis and pathology of cysticercosis • Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases.	10.2, 10.4	Vertical Int IM Horizontal Int MI
PA-SDL-5	• Describe the etiology pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia • Describe the peripheral blood picture in different hemolytic anaemias	16.4, 16.5	Vert Int BI, IM
PA-SDL-6	• Enumerate and describe the causes of leukocytosis leucopenia, lymphocytosis and leukemoid reactions (leukemoid reactions not included in seminar)	18.1	
PA-SDL-7	• Enumerate and differentiate the causes of splenomegaly	19.6	Vertical Int IM, SU
PA-SDL-8	• Describe the etiology, gross and microscopic appearance and complications of lung abscess • Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	26.2	Vertical Int IM Horizontal Int MI
		26.7	Vertical Int IM, CM
PA-SDL-9	• Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of pericarditis and pericardial effusion	27.7	Vertical Int IM
	• Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	27.9	Vert Int IM, PY
PA-SDL-10	• Describe the etiology, hormonal dependence, features and morphology of endometriosis • Describe the etiology and morphologic features of adenomyosis	30.7, 30.8	Vert Int OG
PA- SDL-11	• Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	33.5	Vert Int IM
PA-SDL-12	• Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	36.1	Vertical Int OP

AETCOM – PHASE- II			
PA- AETCOM	**Working in a health care team** • Demonstrate ability to work in a team of peers and superiors • Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers**.** i. "Tag along" session in hospital- 2 x 2 hours **ii.** Small group discussion session - 2 hours	2.4	-
PA- AETCOM	**What does it mean to be family member of a sick patient?** • Demonstrate empathy in patient encounters. i. Hospital visit & interviews - 2 hours, ii. Large Group Discussions with patients' relatives - 1 hour iii. Self-directed Learning - 2 hours iv. Discussion and closure - 1 hour	2.8	-

LIST OF DOAP/ SGD SCHEDULES - PHASE- II						
Sr. No	**Topic**	**Competency No.**	**Teaching learning method**	**Assessment method**	**Number required certify**	**Integration**
General pathology						
1	Introduction to Pathology Dept, Microscope, Histo techniques		SGD			
2	**Cell injury-** Identify and describe various forms of cell injuries, their manifestations and consequences in gross and microscopic Specimens	2.8	DOAP	Skill Assessment		
3	**Inflammation**- Identify and describe acute and chronic inflammation in gross and microscopic specimens	4.4	DOAP	Skill Assessment		
4	**Hemodynamic disorders**- Identify and describe the gross and microscopic features of infarction in a pathologic specimen + **Chronic Venous Congestion**	6.7	DOAP	Skill Assessment		
5	**Disorders of Growth and Epithelial tumors**	7.1	SGD	Skill Assessment		
6	**Mesenchymal and miscellaneous tumors and spread of tumors**	7.1	SGD	Written/ Viva voce		
7	**Amyloidosis-** Identify and describe amyloidosis in a pathology specimen	3.2	DOAP	Skill Assessment		
8	**Leprosy, Pigment disorders & Pathological calcification**	10.3, 2.8	SGD	Written/ Viva voce		
9	**Define and describe the pathogenesis of other common autoimmune diseases (other than SLE)**	9.7	SGD	Written/ Viva voce		Vert Int PY, IM
Hematology						
10	Describe hematopoiesis and extramedullary hematopoiesis	13.1	SGD	Written/ Viva voce		Vertical Int IM
	Describe the role of anticoagulants in hematology	13.2				
	Demonstration of Hb estimation, hematocrit, ESR					
11	Perform, Identify and describe the peripheral blood picture in anemia	13.5	DOAP	Skill Assessment	1	
12	Identify and describe the peripheral smear in microcytic anemia	14.3	DOAP	Skill Assessment		Vertical Int IM
	Identify and describe the peripheral smear in macrocytic anemia	15.3	DOAP	Skill Assessment		
	Prepare a peripheral blood smear and identify hemolytic anemia from it	16.6	DOAP	Skill Assessment		

13	Enumerate the indications and describe the findings in Bone marrow aspiration & biopsy	17.2	SGD	Written/ Viva voce		Vert Int IM
14	PBS in leukemias	18.2	SGD	Written/ Skill Assessment		
	Plasma cell dyscrasia	20.1	DOAP	Skill Assessment		
15	**Complete blood count: Interpretation of report (without flags) from automated cell counter**					
Blood banking and transfusion (1)						
16	Classify and describe blood group systems (ABO and RH)	22.1	SGD	Written/ Viva voce		
	Enumerate the indications, describe the principles, enumerate and demonstrate the steps of compatibility test.	22.2	SGD	Written/ Viva voce		Vertical Int OG
Systemic pathology						
17	**Lymph node and spleen-** Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	19.3	DOAP	Skill assessment		
	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	19.5	DOAP	Skill assessment		Vertical Int SU
	Identify and describe the gross specimen of an enlarged spleen	19.7	DOAP	Skill assessment		
18	**Respiratory System** Identify & describe the gross and microscopic features of pneumonia, tuberculosis of lung & Bronchogenic carcinoma	26.1, 26.4 & 26.6	SGD	Skill assessment		Vertical Int IM
19	**Gastrointestinal System** Identify & describe the gross and microscopic features of peptic ulcer, carcinoma stomach, tuberculosis of intestine, typhoid intestine, carcinoma colon.	24.3 to 24.7	SGD	Skill assessment		
20	**Hepatobiliary system**- Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	25.3	SGD	Written/ Viva voce		
21	**Hepatobiliary system**- - Identify & describe the gross and microscopic features of Cirrhosis of liver & hepatocellular carcinoma. - Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive	25.4, 25.6	SGD DOAP	Skill assessment	1	Vertical Int IM

	jaundice based on clinical features and liver function tests					
22	**Cardiovascular system**- Identify & describe the gross and microscopic features of myocardial infarction Interpret abnormalities in cardiac function testing in acute coronary syndromes (myocardial infarction).	27.5, 27.8	SGD DOAP	Skill assessment		Vertical Int PY, IM
23	**Renal System** Identify & describe the gross and microscopic features of chronic pyelonephritis, Hydronephrosis & Renal cell carcinoma	28.10, 28.13 & 28.14	SGD	Skill assessment		Vertical Int IM
	Describe abnormal urinary findings in disease states and describe common urinary abnormalities in a clinical specimen.	23.1	DOAP			
24	**Male Genital System** Identify & describe the gross and microscopic features of Seminoma & carcinoma penis.	29.1 & 29.2	SGD	Skill assessment		Vertical Int SU
	Describe and interpret the abnormalities in panel containing semen analysis	23.3	DOAP			
25	**Breast-** Describe and identify the morphologic and microscopic features of carcinoma of the breast	31.3	DOAP	Skill assessment		Vertical Int SU
	Female Genital System	30.1, 30.3,	SGD	Written/		Vertical Int
	Identify & describe the gross and microscopic features of carcinoma of cervix, leiomyoma, ovarian tumours & gestational trophoblastic neoplasms.	30.4 & 30.5		Viva voce		OG
26	**Endocrine System** Identify & describe the gross and microscopic features of goitre **Thyroid function test**	32.1, 23.3	SGD DOAP	Skill assessment		Vertical Int IM
27	**Bone and Soft tissue** Identify & describe the gross and microscopic features of Bone & soft tissue tumors	33.2, 33.3	SGD	Written/ Viva voce		Vertical Int OR
28	**Skin-** Identify, distinguish and describe common tumors of the skin.	34.4	DOAP	Skill assessment		Vertical Int DR
29	**CNS-** Identify the etiology of meningitis based on given CSF parameters	35.3	DOAP	Skill assessment	1	Vertical Int IM Horizontal Int MI

Basic Diagnostic Cytology (1)						
30	Observe a diagnostic cytology and its staining and interpret the specimen	8.3	DOAP	Skill assessment		
Clinical Pathology (2)						
31	Renal function tests, liver function tests	23.3	DOAP	Skill assessment		
32	**Instruments and Charts**	-	SGD	Viva- voce		

LIST OF SEMINARS

Sr. No	COMPETENCY	Competency No.	Integration
SEMINAR 1	• Define and describe the pathogenesis and pathology of malaria	10.1	Vert Int IM Horizontal Int MI
SEMINAR 2	• Describe the pathogenesis and features of common cytogenetic abnormalities and mutations in childhood • Describe the pathogenesis of common storage disorders in infancy and childhood.	11.1, 11.3	Vert Int PE
SEMINAR 3	• Describe the pathogenesis and pathology of tumor and tumour- like conditions in infancy and childhood	11.2	Vert Int PE
SEMINAR 4	• Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	12.2	Vert Int BI, PE
SEMINAR 5	• Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia • Describe the pathophysiology and pathologic changes seen in hepatic failure and their clinical manifestations, complications and consequences	25.1 25.2	Vert Int BI, IM Vert Int SU, IM
SEMINAR 6	• Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	32.5	Vert Int PY, IM
	• Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	32.6	Vert Int SU
SEMINAR 7	• Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency • Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	32.7, 32.8	Vert Int PY, IM
SEMINAR 8	• Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	32.9	Vert Int AN, PY, IM, SU

LIST OF DOAP SCHEDULES - PHASE- II						
Sr. No	**Topic**	**Competency No.**	**Teaching learning method**	**Assessment method**	**Number required certify**	**Integration**
1	**Cell injury-** Identify and describe various forms of cell injuries, their manifestations and consequences in gross and microscopic Specimens	2.8	DOAP	Skill Assessment		
2	**Amyloidosis-** Identify and describe amyloidosis in a pathology specimen	3.2	DOAP	Skill Assessment		
3	**Inflammation**- Identify and describe acute and chronic inflammation in gross and microscopic specimens	4.4	DOAP	Skill Assessment		
4	**Hemodynamic disorders**- Identify and describe the gross and microscopic features of infarction in a pathologic specimen + **Chronic Venous Congestion**	6.7	DOAP	Skill Assessment		
5	**Basic diagnostic cytology** Observe a diagnostic cytology and its staining and interpret the specimen	8.3	DOAP	Skill assessment		
6	**Introduction to hematology** Perform, Identify and describe the peripheral blood picture in anemia	13.5	DOAP	Skill Assessment		Vertical Int IM
7	**Microcytic anemia** Identify and describe the peripheral smear in microcytic anemia	14.3	DOAP	Skill Assessment		Vertical Int IM
8	**Macrocytic anemia** Identify and describe the peripheral smear in macrocytic anemia	15.3	DOAP	Skill Assessment		
9	**Hemolytic anemia** Prepare a peripheral blood smear and identify hemolytic anemia from it	16.6	DOAP	Skill Assessment	1	
10	**Lymph node and spleen** Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	19.3	DOAP	Skill assessment		
11	**Lymph node and spleen** Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	19.5	DOAP	Skill assessment		Vertical Int SU
12	**Lymph node and spleen** Identify and describe the gross specimen of an enlarged spleen	19.7	DOAP	Skill assessment		

13	**Plasma cell disorders** Describe the features of plasma cell myeloma	20.1	DOAP	Skill Assessment		
14	**Clinical pathology** Describe abnormal urinary findings in disease states and describe common urinary abnormalities in a clinical specimen.	23.1	DOAP	Skill Assessment		
15	**Clinical pathology** Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests	23.3	DOAP	Skill Assessment		
16	**Hepatobiliary system** Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	25.6	DOAP	Skill assessment	1	Vertical Int IM
17	**Cardiovascular system** Interpret abnormalities in cardiac function testing in acute coronary syndromes (myocardial infarction).	27.8	DOAP	Skill assessment		Vertical Int PY, IM
18	**Breast** Describe and identify the morphologic and microscopic features of carcinoma of the breast	31.3	DOAP	Skill assessment		Vertical Int SU
19	**Skin** Identify, distinguish and describe common tumors of the skin.	34.4	DOAP	Skill assessment		Vertical Int DR
20	**CNS** Identify the etiology of meningitis based on given CSF parameters	35.3	DOAP	Skill assessment	1	Vertical Int IM Horizontal Int MI

LIST OF TOPICS FOR SMALL GROUP DISCUSSION			
Sr. No	**COMPETENCY**	**Competency No.**	**Integration**
SGD 1	• Introduction to Pathology Dept, Microscope, Histo techniques		
SGD 2	• Leprosy, • Pigment disorders, Pathological calcification	10.3 2.3	Vert Int MI
SGD 3	• Disorders of growth & epithelial tumors	2.6, 7.1	
SGD 4	• Neoplasia- Mesenchymal tumors	7.1	
SGD 5	• Describe hematopoiesis and extramedullary hematopoiesis • Describe the role of anticoagulants in hematology • Demonstration of Hb estimation, hematocrit, ESR	13.1 13.2	Vert Int IM
SGD 6	• Enumerate the indications and describe the findings in Bone marrow aspiration & biopsy	17.2	Vert Int IM
SGD 7	• Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia	18.2	Vert Int PE
SGD 8	• CBC blood count: interpretation of report (without flags) from automated cell counter.	-	Vert Int IM
SGD 9	• Define and describe the pathogenesis of other common autoimmune diseases (other than SLE)	9.7	Vert Int IM
SGD 10	• Classify and describe blood group systems (ABO and RH) • Enumerate the indications, describe the principles, enumerate and demonstrate the steps of compatibility test	22.1, 22.2	Vert Int OG
SGD 11	• Gastrointestinal System: Identify & describe the gross and microscopic features of peptic ulcer, carcinoma stomach, tuberculosis of intestine, typhoid intestine, carcinoma colon.	24.3 to 24.7	Vert Int IM, SU
SGD 12	• Respiratory System: Identify & describe the gross and microscopic features of pneumonia, tuberculosis of lung & Bronchogenic carcinoma	26.1, 26.4 & 26.6	Vert Int IM
SGD 13	• Renal System: Identify & describe the gross and microscopic features of chronic pyelonephritis, Hydronephrosis & Renal cell carcinoma	28.10, 28.13 & 28.14	Vert Int AN, SU Vert Int SU Vert Int PE
SGD 14	• Male Genital System: Identify & describe the gross and microscopic features of Seminoma & carcinoma penis.	29.1 & 29.2	Vert Int SU
SGD 15	• Hepatobiliary system: Identify & describe the gross and microscopic features of Cirrhosis of liver & hepatocellular carcinoma.	25.4	Vert Int IM
SGD 16	• Hepatobiliary system: Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	25.3	Vert Int IM

SGD 17	• Female Genital System: Identify & describe the gross and microscopic features of carcinoma of cervix, leiomyoma, ovarian tumours& gestational trophoblastic neoplasms.	30.1, 30.3, 30.4 & 30.5	Vert Int OG
SGD 18	• Endocrine System: Identify & describe the gross and microscopic features of goiter	32.1	Vert Int IM
SGD 19	• Bone and Soft tissue: Identify & describe the gross and microscopic features of Bone & soft tissue tumors	33.2, 33.3	Vert Int OR
SGD 20	• **Instruments and Charts**		

LIST OF TUTORIAL TOPICS

Sr. No	COMPETENCY
T 1	Cell injury
T 2	Inflammation and repair
T 3	Hemodynamic disorders I
T 4	Hemodynamic disorders II
T 5	Immunopathology I
T 6	Immunopathology II
T 7	Infectious diseases
T 8	Disorders of growth and Neoplasia I
T 9	Neoplasia II
T 10	Gastrointestinal system I
T 11	Gastrointestinal system II
T 12	Hepatobiliary system
T 13	Cardiovascular system
T 14	Respiratory System
T 15	Female genital system I
T 16	Female genital system II
T 17	Male Genital System
T 18	Endocrine system and Skin
T 19	Bone and Soft tissue tumors
T 20	Central Nervous System and Eye

LIST OF INTEGRATED TEACHING TOPICS		
Sr. No	**Topic**	**Dept**
IT 1	Inflammation & Repair	Surg
IT 2	Shock	Surg
IT 3	Autoimmune disorder with HIV/ AIDS	Med, Micro
IT 4	Tuberculosis, Leprosy	Med/ Micro
IT 5	Genetic disorders of childhood	Pead
IT 6	Anaemia – Micro/ Macro	Med/ Biochem
IT 7	Anaemia – Haemolytic	Med
IT 8	Lesions of Lymph reticular system	Surg
IT 9	Haemorrhagic Disorders	Pead/ GenMed
IT 10	Haemolytic disease of newborn	Ob Gyn.
IT 11	Blood Component/ Transfusion reaction	Med
IT 12	Peptic ulcer	Med
IT 13	Neoplastic and other nonneoplastic lesion of GIT	Surg
IT 14	Hepatobiliary system	Surg/Med/Biochem
IT 15	RS – Pneumonia, COPD, COAD, Tumors	Med/Micro/Physio/Med/PSM
IT 16	CVS – I – Atherosclerosis MI, Cardiac failure CVS – II – Valvular heart disease	Med Med
IT 17	Kidney – I – GN, Renal failure	Med
	Kidney – II – Tumors, Pyelonephritis	Surg/ Pead
IT 18	MGS – Testicular and prostatic lesion	Surg
IT 19	FGS – I – Ca cervix, endometrium, FGS – II – Ovary & Trophoblastic	Ob Gyn
IT 20	Breast – Lesions of breast	Surg/ Anatomy
IT 21	Endocrine – I – Thyroid, parathyroid	Med
	Endocrine – II – Adrenal, pancreas (Diabetes Mellitus)	Med/ Surg
IT 22	Lesion of bone & joints	Ortho
IT 23	Tumours of skin	Skin
IT 24	Meningitis & CSF	Gen Med
IT 25	Retinoblastoma	Opthol

LIST OF SPECIMENS

GENERAL PATHOLOGY

Cell injury

1. Fatty liver
2. Vesicular mole (hydropic change)
3. Tubercular lymph node- caseation, matted lymph nodes
4. Gangrene intestine/ foot

Cellular adaptation

5. Atrophy - Uterus
6. Cardiac hypertrophy
7. Hyperplasia- Gravid uterus
8. Dystrophic calcification- Lymph node
9. Anthracosis
10. Melanoma

Inflammation & repair

11. Acute appendicitis
12. Lobar Pneumonia
13. Abscess- lung/ liver
14. TB lymphnode
15. Mycetoma foot
16. Healed Myocardial infarction

Tuberculosis

17. TB lung- gohn's focus
18. TB lung- fibro caseous, cavitary
19. TB miliary – lung
20. TB lymph node
21. TB intestine

Hemodynamic disorders

22. CVC Liver
23. CVC Lung
24. Splenic infarct
25. Myocardial infarction

Neoplasia

26. Lipoma
27. Leiomyoma
28. Fibroadenoma- breast
29. Intestinal adenomatous polyp
30. Squamous cell carcinoma- skin/cervix/penis
31. Adenocarcinoma- intestine
32. Carcinoma breast
33. Metastasis – Liver/ lung

SYSTEMIC PATHOLOGY

Gastrointestinal

34. Benign ulcer-Peptic ulcer
35. Tubercular intestine
36. Typhoid intestine
37. Malignant ulcer- Carcinoma stomach
38. Carcinoma oesophagus
39. Adenocarcinoma colon
40. Carcinoma rectum

Hepatobiliary

41. Cirrhosis
42. Fatty liver
43. Pyemic liver Abscess
44. Amoebic liver abscess
45. Hepatocellular carcinoma
46. Gall bladder with stones

Respiratory

47. Pulmonary tuberculosis
48. Miliary tuberculosis
49. Bronchectasis
50. Bronchogenic carcinoma
51. Lobar pneumonia
52. CVC lung

Cardiovascular

53. Atherosclerosis
54. Myocardial infarction
55. Left ventricular hypertrophy

Urinary

56. Small contracted kidney
57. Renal cell carcinoma
58. Hydronephrosis
59. Renal calculi
60. Wilm's tumour
61. Acute pyelonephritis
62. Carcinoma bladder
63. Polycystic kidney

Male genital

64. Carcinoma penis
65. Seminoma

	Female genital & Breast 66. Carcinoma cervix 67. Dermoid cyst 68. Ovarian cystadenoma 69. Leiomyoma 70. Vesicular mole 71. Fibroadenoma of breast 72. Carcinoma breast **Endocrine** 73. Goitre 74. Solitary thyroid nodule **Bone** 75. Sequestrum 76. Giant cell tumour 77. Osteogenic sarcoma

LIST OF SLIDES

GENERAL PATHOLOGY

Cell injury

1. Fatty liver
2. Cloudy change-kidney
3. Hyaline change in leiomyoma
4. Tubercular lymph node

Cellular adaptation

5. Benign prostate hyperplasia
6. Squamous metaplasia
7. Calcification
8. Anthracosis
9. Melanoma

Inflammation & repair

10. Acute appendicitis
11. Lobar Pneumonia
12. Tubercular lymphadenitis (Caseous necrosis, granuloma)
13. Actinomycosis
14. Rhinosporidiosis
15. Granulation tissue

Tuberculosis

16. TB lung
17. TB miliary – lung, liver
18. TB lymph node

Hemodynamic disorders

19. CVC Liver
20. CVC Lung
21. Organised thrombus
22. Myocardial infarction
23. Renal infarct

Leprosy & Amyloidosis

24. Amyloidosis- kidney/ spleen
25. Tuberculoid leprosy
26. Lepromatous leprosy

Neoplasia

27. Lipoma
28. Leiomyoma
29. Fibroadenoma- breast
30. Capillary hemangioma
31. Cavernous hemangioma
32. Squamous papilloma
33. Squamous cell carcinoma-skin
34. Adenocarcinoma- intestine
35. Carcinoma breast
36. Metastasis – Liver/ lung/ lymph node

SYSTEMIC PATHOLOGY

Gastrointestinal

37. Benign ulcer-Peptic ulcer
38. Acute appendicitis
39. Tubercular intestine
40. Adenocarcinoma colon

Hepatobiliary

41. Fatty liver
42 Miliary TB
43. Cirrhosis
44. Hepatocellular carcinoma
45. Metastasis in liver

Respiratory

46. CVC lung
47. Lobar pneumonia
48. Pulmonary tuberculosis
49. Miliary tuberculosis
50. Bronchogenic carcinoma
51. Metastasis in lung

Cardiovascular

52. Myocardial infarction

Lymphnode

53. TB lymph node
54. Metastasis lymph node
55. Hodgkins lymphoma

Urinary

56. Chronic pyelonephritis
57. Renal cell carcinoma

Male genital

58. Carcinoma penis
59. Seminoma
60. Benign prostate hyperplasia

Female genital & Breast

61. Leiomyoma
62. Products of conception
63. Dermoid cyst
64. Carcinoma cervix
65. Fibroadenoma of breast
66. Carcinoma breast

Endocrine

67. Colloid goitre
68. Hashimoto's thyroiditis

Soft tissue & Bone

69. Lipoma

	70. Giant cell tumour 71.Osteogenic sarcoma **Skin** 72. Nevus 73. Squamous cell carcinoma 74. Basal cell carcinoma 75. Melanoma **CNS** **76.** Meningioma **HEMATOLOGY SLIDES** 77. Eosinophilia 78. Neutrophilia 79. Microcytic anemia 80. Megaloblastic marrow 81. Sickle cell anemia 82. Acute leukemia 83. Chronic myeloid leukemia 84. Chronic lymphocytic leukemia

CASE-BASED LEARNING	**CHARTS**
1. Microcytic anemia 2. Macrocytic anemia 3. Hemolyticanemia 4. Multiple myeloma 5. Hepatitis 6. Obstructive jaundice 7. Hemolytic jaundice 8. Nephrotic syndrome 9. Meningitis	1. Interpretation of microcytic anemia 2. Interpretation of macrocytic anemia 3. Interpretation of hemolyticanemia 4. Interpretation of acute leukemia 5. Interpretation of chronic leukemia 6. Interpretation of multiple myeloma 7. Interpretation of bleeding disorder 8. Interpretation of clotting disorder 9. Interpretation of Liver disorders 10. Interpretation of Renal disorders 11. Interpretation of Thyroid disorders 12. Interpretation of acute myocardial infarction 13. Pyogenic meningitis 14. Tubercular meningitis 15. Viral meningitis 16. Diabetes mellitus

PAPER WISE TOPIC DISTRIBUTION

TERM WISE TOPIC DISTRIBUTION	
First Internal Assessment Examination – Syllabus	
Section B + C	
General Pathology: 1. Introduction to Pathology 2. Cell injury and adaptation 3. Inflammation 4. Healing and repair 5. Tuberculosis and leprosy 6. Hemodynamic disorders 7. Amyloidosis 8. Immunopathology and AIDS 9. Neoplasia 10. Infections and infestations 11. Genetic and paediatric diseases 12. Environmental and nutritional diseases	**Hematology** 1. Introduction to hematology 2. Microcytic anemia 3. Macrocytic anemia 4. Hemolyticanemia 5. Aplastic anemia 6. Leukocyte disorders 7. Plasma cell disorders

Second Internal Assessment Examination – Syllabus	
Section B + C	
1. Gastrointestinal system 2. Hepatobiliary system 3. Respiratory system 4. Cardiovascular system 5. Lymph node and spleen 6. Urinary tract 7. Male reproductive system 8. AETCOM	1. Hemorrhagic disorders 2. Blood banking and transfusion 3. Clinical pathology 4. Basic diagnostic cytology

<table>
<tr><td colspan="2">Third Internal Assessment Examination – (Preliminary Examination)- Syllabus</td></tr>
<tr><td colspan="2">Paper I</td></tr>
<tr><td colspan="2">Section B + C</td></tr>
<tr><td>General Pathology:
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3. Inflammation
4. Healing and repair
5. Hemodynamic disturbances
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7. Immunopathology and AIDS
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9. Infections and infestations
10. Genetic and paediatric diseases.
11. Environmental and nutritional diseases</td><td>Hematology
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2. Microcytic anemia
3. Macrocytic anemia
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5. Aplastic anemia
6. Leukocyte disorders
7. Plasma cell disorders
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AETCOM 2.4 & 2.8</td></tr>
<tr><td colspan="2">Paper II</td></tr>
<tr><td colspan="2">Section B + C</td></tr>
<tr><td>Systemic Pathology
Gastrointestinal tract
1. Hepatobiliary system
2. Respiratory system
3. Cardiovascular system
4. Lymph node & spleen
5. Urinary tract
6. Male genital tract
7. Female genital tract
8. Breast
9. Endocrine system
10. Bone and soft tissue
11. Skin
12. Central Nervous System
13. Eye</td><td>Clinical pathology
1. Urine analysis
2. Body fluid analysis
3. CSF analysis
4. Liver function test
5. Renal function test
6. Diabetes mellitus
7. Thyroid function test
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<tr><td colspan="2">University Examination</td></tr>
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NATURE OF THEORY EXAMINATION PAPER

THEORY PAPER PATTERN – I TERM ENDING				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	**MCQs** Multiple choice questions	20	1 mark each	20 marks
Section – B	**SAQs** Structured short answer questions	12 (Out of 13)	5 marks each	60 marks
Section – C	**LAQs** Structured Long Answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

THEORY PAPER PATTERN – II TERM ENDING				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	**MCQs** Multiple choice questions	20	1 mark each	20 marks
Section – B	**SAQs** Structured short answer questions	One AETCOM question (compulsory)	5 marks	5 marks
		11 (Out of 12)	5 marks each	55 marks
Section – C	**LAQs** Structured Long Answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**
THEORY PAPER PATTERN – PRELIMINARY EXAM PAPER – I				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	**MCQs** Multiple choice questions	20	1 mark each	20 marks
Section – B	**SAQs** Structured short answer questions	One AETCOM question (compulsory)	5 marks	5 marks
		11 (Out of 12)	5 marks each	55 marks
Section – C	**LAQs** Structured Long Answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

THEORY PAPER PATTERN – PRELIMINARY EXAM PAPER – II				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	**MCQs** Multiple choice questions	20	1 mark each	20 marks
Section – B	**SAQs** Structured short answer questions	12 (Out of 13)	5 marks each	60 marks
Section – C	**LAQs** Structured Long Answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

THEORY PAPER PATTERN – UNIVERSITY EXAM PAPER – I				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	**MCQs** Multiple choice questions	20	1 mark each	20 marks
Section – B	**SAQs** Structured short answer questions	One AETCOM question (compulsory)	5 marks	5 marks
		11 (Out of 12)	5 marks each	55 marks
Section – C	**LAQs** Structured Long Answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

THEORY PAPER PATTERN – UNIVERSITY EXAM PAPER – II				
Section		**Total questions**	**Marks allotted**	**Total Marks**
Section – A	**MCQs** Multiple choice questions	20	1 mark each	20 marks
Section – B	**SAQs** Structured short answer questions	12 (Out of 13)	5 marks each	60 marks
Section – C	**LAQs** Structured Long Answered questions	2 (Out of 3)	10 marks each	20 marks
		Total		**100 marks**

NATURE OF PRACTICAL EXAMINATION PAPER

MBBS Practical Mark's Structure

Internal Assessment I										
Practical						**Oral/Viva**				**Total**
Seat No	OSPE	PS/DLC	CBC report interpretation	HP slide	Total	Gross specimen General Pathology	Hematology	Total	Log book	Practical & Oral
	20	20	10	10	60	15	15	30	10	100 Marks

Internal Assessment II											
Practical							**Oral/Viva**				**Total**
Seat No	OSPE	Urine analysis chart interpretation	HP slide	Blood group	Chart Clinical case	Total	Gross specimen Systemic Pathology	Clinical Pathology	Total	Log Book	Practical & Oral
	20	10	10	10	10	60	15	15	30	10	100 Marks

Preliminary examination													
Seat no	Practicals								**Oral/Viva**				**Practical + Oral**
	OSPE	PS/DLC	CBC report interpretation	Blood group	HP slide	Urine analysis chart interpretation	Chart Clinical case	Total	Gross specimens	Clinical path & hemat	Total	**logbook**	
	20	10	05	05	15	10	05	70	10	10	20	10	100 Marks

University Examination													
Seat no	Practicals							Oral/Viva					Practical + Oral
	OSPE	PS/DLC	CBC report interpretation	Blood group	HP slide	Urine analysis chart interpretation	Total	Gross specimens			Clinical & hematology	Total	(G+L)
								Gen Path	Systemic Path I	Systemic Path II			
	A	B	C	D	E	F	G	H	I	J	K	L	M
Max marks	20	10	05	05	10	10	60	10	10	10	10	40	100

For Urine examination

Students are not expected to perform urine examination, but to interpret results. Clinical cases with urinary findings may be given to them for interpretation.

Suggested OSPE stations

1. Clinical chart interpretation (Clinical Pathology) - 2 marks
2. Clinical chart interpretation (Clinical Pathology) - 2 marks
3. Clinical chart interpretation (CSF) - 2 marks
4. Clinical chart interpretation (Hematology)- 2 marks
5. Slides (3)- Hematology, benign, inflammatory- 6 marks

Specimens (3)- 6 marks

Phase	I IA-Exam			II IA-Exam			Prelims		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical	Total Marks
Second MBBS	100	100	200	100	100	200	Paper 1 - 100 Paper 2 - 100	100	300

Eligibility criteria for appearing in university examination:

1. There will be 3 internal assessment examinations in Pathology. The structure of the internal assessment theory examinations should be similar to the structure of University examinations.
2. It is mandatory for the students to appear for all the internal assessment examinations.
3. First internal assessment examination will be held in June, second internal assessment examination will be held in September and third internal assessment examination will be held in December.
4. A student who has not taken minimum required number of marks for Internal Assessment each in theory and practical will not be eligible for University examinations.
5. There will be only one additional examination for absent students (due to genuine reason) after approval by the Institutional Grievances Committee. It should be taken after preliminary examination and before submission of internal assessment marks to the University.
6. Internal assessment marks for theory will be out of 400 and practical will be out of 300.
7. Reduce total theory internal assessment to 40 marks and total practical internal assessment to 40 marks. Students must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) to be eligible for appearing University examination.

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% separately in Theory & Practical, 50% Combined)	
Theory	100	100	200	400	$\frac{\text{Total marks obtained}}{10}$	16 (Minimum)	Total of Theory + Practical must be 40.
Practical	100	100	100	300	$\frac{\text{Total marks obtained}}{05}$	16 (Minimum)	

8. While preparing Final Marks of Internal Assessment, the rounding-off marks shall be done as illustrated in following table

Internal Assessment	**Marks Final rounded marks**
15.01 to 15.49	15
15.50 to 15.99	16

9. Internal assessment marks will reflect as separate head of passing at the summative examination.
10. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

Passing criteria:

a. **Complete passing in phase I examination** is compulsory before proceeding to phase II.
b. A student who fails in the **second year course examination should not be allowed to appear for III phase examination** unless he /she passes all the subjects of second year course.
c. The students must secure at least 50 % marks of total marks (combined theory & practical /clinical) and not less than **40 % marks in theory and practical separately** assigned for particular internal assessment.
d. **Additional Internal assessment** examination for non-eligible students (less than 50 % combined in theory and practical or 40% separately) will be conducted after prelims and before submission of internal assessment marks.
e. **Student who will not be eligible after additional internal examination will appear with next regular batch as repeater student.**

Supplementary examination

Supplementary examination should be conducted within 4- 6 weeks after University result.

LEARNING RESOURCE MATERIAL BOOKS

Textbooks recommended:

a) Kumar, Abbas and Aster Robbins and Cotran Pathologic basis of Disease
b) General Pathology by IC Talbot & JB Walter
c) Text book of Pathology by Harsh Mohan
d) Exam preparatory manual for undergraduates by RamadasNayak
e) Rubin R & Strayer DS Rubin's Pathology
f) Haematology De Gruchy
g) Text book of General Pathology Part I & II by Bhende and Deodhare

Reference books:

a) McKenzie SB, Williams JL. Clinical laboratory hematology
b) Bein JB, Bates I, Laffan MA, Dacie and Lewis Practical hematology
c) Damjnov I, Linder J. Anderson's Pathology
d) Rosai J Rosai & Ackerman's Surgical Pathology

MICROBIOLOGY

Vision

- To become a world class dynamic institution of education, research and training to develop globally competitive professional and socially responsible human resource.

Mission

- To ensure globally relevant quality higher education and skill enhancement for providing required trained manpower to the nation & the world.
- To promote symbiotic relations with industry, academic & research institutions and community to meet the expectations of various stakeholders.
- To engage in interdisciplinary research and innovate for furtherance of knowledge, technology and growth.
- To put in place dynamic technocracy for effective use of emerging trends in curriculum development, andragogy, evaluation and system management.
- To provide an environment for holistic evolution of the learners as human, socially responsible and conscious of sustainable ecosystem.

Course Objectives: -

Knowledge

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

I. State the normal flora of the human body and describe the host parasite relationship.
II. List the pathogenic microorganisms (bacteria, viruses, parasites, fungi and describe the Pathogenesis of the disease produced by them.
III. State or indicate the modes of transmission of pathogenic and opportunistic Organisms and their sources including insect vectors responsible for transmission of infection.
IV. Acquire basic knowledge of normal immune system, abnormalities, identification of conditions of immunological importance.
V. Describe the mechanisms of immunity to infections.
VI. Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immune – therapy and different vaccines available for prevention of communicable diseases.
VII. Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.
VIII. Recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.
IX. To acquire knowledge of safe handling and disposal of infectious waste.
X. Acquire basic knowledge of laboratory diagnosis, treatment, control and prevention of infections.
XI. Acquire basic knowledge of microbial physiology and genetics.
XII. Investigation of outbreaks including collection of sample.

Skills

The following are the skills expected to be acquired by the students at the end of course:

I. Operate the light compound microscope.

II. Common laboratory techniques (as given below) for the direct demonstration of microorganisms from clinical materials and interpret their findings.
    a. Saline and iodine wet mount preparations (stool) for the demonstration of trophozoites, Ova or cysts
    b. Collection of blood by finger prick, preparation of smear and Giemsa/JSB staining and examination for malarial parasites and microfilaria.
    c. Preparation of a smear and performance of Gram stain and interpretation – body fluids, urine, sputum and pus specimens,
    d. Preparation of a smear and perform Ziehl–Neelsen stain with biosafety precautions for the demonstration of acid fast bacilli from sputum.

III. Identification of the common microorganisms isolated from clinical specimens by colony appearance and biochemical tests genus/species level. Interpretation of the results of antimicrobial testing for the diagnosis of common infectious diseases.

IV. Identification of some common fungi based on colony morphology and LPCB microscopy ;

V. Reading and interpretation of serological tests -Widal, rapid plasma Reagin, ELISA, HIV/HBV rapid tests, latex agglutination tests-rheumatoid factor and ASO.

VI. Blood collection through venipuncture with aseptic precautions while performing Blood culture

VII. Collection of clinical samples :pus through syringe (aspirate) or swab; clean catch midstream urine sample; sputum with minimal contamination by saliva

VIII. Hand hygiene and standard work precautions.

Integration

Practical Knowledge of application of Microbiology in clinical practice will be acquired through integrated teaching vertically with Pre clinical and clinical subjects and horizontally with other Para-clinical subjects.

Programme Outcomes

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

1. Graduate Attributes: Medical and Scientific Knowledge.

PO 1 :

- Demonstrate knowledge of normal and abnormal human structure, function and development from a molecular, cellular, biologic, clinical, behavioural and social perspective.
- Demonstrate knowledge about established and evolving biomedical and clinical sciences.
- 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. Graduate Attributes: Planning Patient Care and problem solving abilities

PO 2:

- Demonstrate ability to apply this knowledge to the practice of medicine in routine, emergency and disaster situations.
- Demonstrate ability to appraise and assimilate scientific evidence into their own ongoing learning, research, and patient care.
- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context
- Demonstrate ability to provide evidence-based care that is compassionate, respectful of patients' differences, values, and preferences.

3. Graduate Attributes: Professional excellence & Ethics

PO 3:

- Demonstrate commitment to the highest standards of professional responsibility towards patient, colleagues, society, growth of medical professional and adhere to universally accepted code of ethics.
- Demonstrate personal attributes of compassion, honesty, integrity, accountability, empathy in patient encounters.

4. Graduate Attributes: Communication Skills.

PO 4:

- Demonstrate ability to communicate effectively, respectfully, non-judgemental, empathetic manner with patients, their families and colleagues that will improve patient satisfaction ,health care and encourages participation and shared decision-making.

- Demonstrate the ability to listen clearly, inform, communicate and educate patients &/ caregivers for the promotion of health, diagnosis of disease and the treatment of illness; advocate for disease prevention, wellness and the promotion of healthy lifestyles including a focus on population health

5. Graduate attributes: Leader & Member of the health care team & System

PO 5:

- Demonstrate the ability to work effectively, efficiently & in rational way with his/ her colleagues and other team members, educate & motivate the team members in a manner to maximize the health delivery potential of the team, considering various roles, responsibilities and competencies of the other health professionals.
- Identify the self- potential, functioning ability as a team leader in primary and secondary health care settings, utilize various indicators of the health care system and to promote appropriate, low cost, ethical, fair and qualitative health delivery.

6. Graduate attributes: Lifelong learner

PO 6:

- Demonstrate ability to acquire new knowledge, skills and reflect upon their experience to enhance personal and professional growth and apply the information in the care of the patient.
- Demonstrate self-motivation and awareness to their own limitations.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

7. Graduate attributes: Research Aptitude

PO7:

- Demonstrate an attitude of inquiry/search/investigation ,scientific and objective effort to uncover facts**.**

8. Graduate attributes: Societal Responsibilities

PO8 :

- Demonstrate accountability in fulfilling their duty for the benefit of the entire society.

9. Graduate attributes: Awareness towards Environment and sustainability

PO9 :

- Demonstrates responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future.

Course Outcomes:

CO 1: To demonstrate ability to evaluate and estimate the various Microbiological parameters, analyse on the basis of choice of various lab diagnostic tests interpretation relevant to clinical case scenario.

CO 2: To demonstrate knowledge about the micro-organisms causing different infections, lab diagnostic tests for detection / confirmation of different infections, immunology, Hospital Infection Control (HIC), antibiotic stewardship, antibiotic resistance, personal safety, OT sterility and BMW management.

CO 3:

I. To demonstrate respect for patient sample, during collection and processing.
II. To get knowledge regarding the professional attributes.

CO 4: To demonstrate ability to utilize communication strategies involving nonverbal, verbal, written modalities in an organised and clear manner in order to communicate, create report and share relative information with clinicians.

CO 5: To demonstrate the ability to work effectively, efficiently and rationally with colleagues and team members, educate and motivate the team members, identify the self and other potential functioning ability as a team leader to maximise the outputs (departmental small project)

CO 6:

1. To demonstrate lifelong learning skills (SDL) needed to stay informed new relevant scientific findings, new diseases, handling disasters and pandemic
2. Demonstrate reflective practice through self-assessment ability to analyse one's experience. Ability to identify limitations and areas for self-improvement and further education. Ability to acquire new knowledge skills and reflect in log book.

Goal: - The broad goal of the teaching of undergraduate students in Microbiology is to provide an understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, immune response in health and disease, laboratory diagnosis, treatment, control and prevention of infections in the community.

Course Objectives: -

(a). Knowledge

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

XIII. State the normal flora of the human body and describe the host parasite relationship.

XIV. List the pathogenic microorganisms (bacteria, viruses, parasites, fungi and describe the Pathogenesis of the disease produced by them.

XV. State or indicate the modes of transmission of pathogenic and opportunistic Organisms and their sources including insect vectors responsible for transmission of infection.

XVI. Acquire basic knowledge of normal immune system, abnormalities, identification of conditions of immunological importance.

XVII. Describe the mechanisms of immunity to infections.

XVIII. Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immune – therapy and different vaccines available for prevention of communicable diseases.

XIX. Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.

XX. Recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.

XXI. To acquire knowledge of safe handling and disposal of infectious waste.

XXII. Acquire basic knowledge of laboratory diagnosis, treatment, control and prevention of infections.

XXIII. Acquire basic knowledge of microbial physiology and genetics.

XXIV. Investigation of outbreaks including collection of samples.

(b). Skills

The following are the skills expected to be acquired by the students at the end of course:

IX. Operate the light compound microscope.

X. Common laboratory techniques (as given below) for the direct demonstration of microorganisms from clinical materials and interpret their findings.
   a. Saline and iodine wet mount preparations (stool) for the demonstration of trophozoites, Ova or cysts
   b. Collection of blood by finger prick, preparation of smear and Giemsa/JSB staining and examination for malarial parasites and microfilaria.
   c. Preparation of a smear and performance of Gram stain and interpretation – body fluids, urine, sputum and pus specimens,
   d. Preparation of a smear and perform Ziehl–Neelsen stain with biosafety precautions for the demonstration of acid fast bacilli from sputum.

XI. Identification of the common microorganisms isolated from clinical specimens by colony appearance and biochemical tests genus/species level. Interpretation of the results of antimicrobial testing for the diagnosis of common infectious diseases.

XII. Identification of some common fungi based on colony morphology and LPCB microscopy ;

XIII. Reading and interpretation of serological tests -Widal, rapid plasma Reagin, ELISA, HIV/HBV rapid tests, latex agglutination tests-rheumatoid factor and ASO.

XIV. Blood collection through venipuncture with aseptic precautions while performing Blood culture

XV. Collection of clinical samples :pus through syringe (aspirate) or swab; clean catch midstream urine sample; sputum with minimal contamination by saliva

XVI. Hand hygiene and standard work precautions.

(c). Integration:-

Practical Knowledge of application of Microbiology in clinical practice will be acquired through integrated teaching vertically with Pre clinical and clinical subjects and horizontally with other Para-clinical subjects.

Course Content

Based on National Medical Commission (NMC), Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018.

1. Total Teaching hours :190 hours
2. Lectures(hours): 70 hours
   a. Self-directed learning (hours): - 10 hours
   b. Clinical Postings (Hours):NA
   c. Small group teachings/tutorials/Integrated teaching / Practical's (hours):110 hours including DOAP sessions (Gram staining, Z-N staining & Stool examination). AETCOM module: 3 modules-16 hrs
   d. Pandemic module: 2 modules- 2.1 & 2.3: 10 hours

List of Didactic Lecture schedule- Phase -II

Part I: General Microbiology and Immunology

Sr. No	Topic	Competency No	Integration
	Section I: General Microbiology		
1	Introduction to Microbiology and historical aspects. Introduction to bacteria, viruses & Bacteriophages, fungi, parasites, host parasite relationship, normal flora.	MI1.1	Horizontal integration Pathology Vertical Integration Dermatology, Medicine, Paediatrics, Ophthalmology
2	Morphology of bacteria, microscopy, Gram staining, Z-N staining, stool examination- routine microscopy	MI1.2	Horizontal integration Pathology
3	Types of infection, source/ reservoir of infection, modes of transmission, pathogenicity, definition of prevalence, incidence, types of infectious diseases (endemic, epidemic, pandemic, sporadic)	MI1.3	Vertical Integration Community medicine
4	Methods of sterilization and disinfection, their application in the laboratory, clinical and surgical practice, demonstration of working of autoclave	MI1.4	Vertical Integration Surgery
5	Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice	MI1.5	Vertical Integration Surgery
6	Mechanism of drug resistance, methods of antibiotic susceptibility testing, definition of MIC, MBC, break points, Interpretation of antibiotic susceptibility test report, antimicrobial audit/use, antibiotic policy, antimicrobial stewardship.	MI1.6	Horizontal integration Pharmacology Vertical Integration Medicine

	Section II: Immunology		
7	Immunity, structure & functions of immune system	MI1.7	Horizontal integration Pathology
8	Antigen, antibodies, immune response and complement, antigen antibody reactions	MI1.8	Vertical Integration Medicine
9	Vaccines, universal vaccination program, Immunoprophylaxis, immunotherapy	MI1.9	Vertical Integration Paediatrics
	Hypersensitivity, autoimmune disorders and immunodeficiency states, laboratory methods used in their detection	MI1.10	Horizontal integration Pathology
10	Immunological mechanisms of transplantation and tumor immunity	MI1.11	Horizontal integration Pathology Vertical Integration Surgery

Part II:- Systemic Microbiology (Infectious Diseases)

Sr.No	Topic	Competency No	ntegration
	Section III: Bloodstream and Cardiovascular System infections		
1	Rheumatic Heart Disease-definition, etiological agent, pathogenesis, clinical features and laboratory diagnosis. Streptococci	MI 2.1	Horizontal integration Pathology Vertical Integration Medicine
2	Infective endocarditis- classification, etiological agents, pathogenesis, clinical features and laboratory diagnosis. Streptococcus viridans, Streptococcus mutans, HACEK	MI 2.2	Horizontal integration Pathology Vertical Integration Medicine
3	Blood collection for culture, throat swab collection, blood culture, ASO test, interpretation of the test	MI 2.3	Horizontal integration Pathology
4	Anemia-definition, etiological agents, pathogenesis, clinical features and laboratory diagnosis. Hookworm, Trichuristrichiura,	MI 2.4	Horizontal integration Pathology
5	Kala azar, malaria, filariasis and other common parasites prevalent in India - *Schistosomes, **Fasciolopsisbuski,** Paragonimuswestermani,*	MI 2.5	Horizontal integration Pathology, Pharmacology Vertical Integration Medicine , Community medicine
6	Peripheral smear staining for malaria, Identify the slide for filarial	MI 2.6	Horizontal integration Pathology, Vertical Integration Medicine
7	HIV- epidemiology, the etio- pathogenesis, evolution,complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV	MI 2.7	Horizontal integration Pathology, Vertical Integration Medicine
	Section IV: Gastrointestinal (GI) Infections		
8	Microbial agents causing diarrhea and dysentery-epidemiology, morphology, pathogenesis, clinical features and laboratory diagnosis of Shigella, Campylobacter,. Vibrio, salmonella, E. hystolytica, Giardia, B. coli, H. nana, Taenia , Intestinal nematodes, Norwalk virus and Rota virus, Coronavirus	MI3.1	Vertical Integration Medicine , Community medicine, Paediatrics Horizontal integration Pathology
9	Stool examination-routine microscopy, hanging drop preparation,	MI 3.2	--
10	Septicemia, Enteric fever and Food poisoning Salmonella -Morphology, pathogenesis, clinical features, laboratory diagnosis.	MI 3.3	Vertical Integration Medicine
11	Blood culture, Widal test, Stool culture, Clot culture, Interpretation of the reports	MI 3.4	Vertical Integration Medicine
12	Food poisoning- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Staphylococci, Cl. botulinum, Bacillus cereus	MI 3.5	Vertical Integration Paediatrics

13	Acid peptic disease (APD)- etio-pathogenesis, clinical course laboratory diagnosis and management H. pylori	MI 3.6	Vertical Integration Medicine
14	Viral hepatitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Hepatitis A, B, C, D, E, Cytomegalovirus, Epstein-Barr virus, HSV, VZV, Measles, Rubella	MI 3.7	Vertical Integration Medicine, Paediatrics
15	Serological tests for the laboratory diagnosis of viral hepatitis, viral markers, interpretation of reports	MI 3.8	Vertical Integration Medicine, Paediatrics Horizontal integration Pathology
	Section V: Respiratory Tract Infections		
	Upper respiratory tract infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Orthomyxo virus, Paramyxo virus, Adenovirus, Rhinovirus, Diphtheria, Bordetella and Lower respiratory tract infections-etiological agents, pathogenesis, clinical features and laboratory diagnosis Streptococcus pneumonia, Mycobaterium tuberculosis	MI6.1	Vertical Integration Medicine, Paediatrics Horizontal integration Pathology
	Gram staining- Interpretation of results	MI6.2	Vertical Integration Medicine
	Z-N staining and Fluorescent staining- Interpretation of results	MI6.3	Vertical Integration Medicine, Paediatrics
	Section VI: Urogenital Tract Infections		
	Genitourinary infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Non-gonococcal urethritis, Trichomoniasis, . Bacterial vaginosis	MI7.1	Vertical Integration Medicine
	Sexually transmitted infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Syphilis, Gonorrhea, Herpes, Calymmatobacterium, HPV, Molluscumcontagiosum	MI 7.2	Vertical Integration Medicine Horizontal integration Dermatology
	Urinary tract infections- etiological agents, pathogenesis, significant bacteruria , clinical features and laboratory diagnosis. E. coli, Klebsiella, Proteus	MI7.3	Vertical Integration Medicine
	Section VII: Skin and Soft Tissue and Musculoskeletal System Infections		
	Anaerobic infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Spore bearing and non-spore bearing anaerobes, Clostridia	MI4.1	Vertical Integration Medicine

	Bone and joint infections- etio-pathogenesis, clinical features and laboratory diagnosis. Prosthetic joint infections, Staphylococci, Acinetobacter	MI4.2	Vertical Integration Medicine
	Skin and soft tissue infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Superficial, cutaneous and sub-cutaneous fungal infections, Mycetoma, Leprosy, Herpes.	MI4.3	Vertical Integration Medicine, Dermatology Horizontal integration Pharmacology
	Section VIII: Central Nervous System (CNS) Infections		
	Meningitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Meningococci, Leisteria, H. influenzae, Cryptococcus neoformans	MI5.1	Vertical Integration Paediatrics
	Encephalitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Primary amoebic meningo- encephalitis, viral encephalitis, Japanese encephalitis, Rabies, Aseptic meningitis - ECHO viruses	MI5.2	Vertical Integration Medicine, Paediatrics
	laboratory diagnosis of meningitis, interpretation of laboratory reports	MI5.3	--
	Section IX: Miscellaneous Infective Syndromes		
	Zoonotic diseases- etiological agents, mode of transmission, pathogenesis, clinical features laboratory diagnosis and prevention- Yesinia, Leptospira, Anthrax and Arbo viruses, Hydatid disease	MI8.1	Vertical Integration Medicine
	Opportunistic infections- etio-pathogenesis, factors contributing to the occurrence of OI, laboratory diagnosis - Toxoplasma, Pneumocystis jiroveci, Cryptospora, Isospora,	MI8.2	Vertical Integration Medicine
	Oncogenic viruses in the evolution of virus associated malignancy	MI8.3	Vertical Integration Medicine Horizontal Integration Pathology
	Section X: Hospital Infection Control		
	Healthcare Associated Infections (HAI)- definition, types, factors that contribute to the development of HAI and the methods for prevention- Pseudomonas, MOTT, Antibiotic associated diarrhea	MI8.5	Vertical Integration Medicine
	Hand hygiene, bio medical waste management, environmental hygiene, use of equipments, respiratory hygiene and cough etiquette, PEP, spill management, vaccination	MI 8.6	Vertical Integrationcommunity Medicine

	Infection control practices and use of Personal Protective Equipments (PPE)	MI8.7	Vertical Integrationcommunity Medicine
	Microbiology of food, water and air	MI8.8	
	Methods of sample collection and transport	MI8.9	
	Collection and transport of specimens	MI8.10	
	Respect for patient samples sent to the laboratory for performance of laboratory tests	MI8.11	
	Confidentiality pertaining to patient identity in laboratory results	MI8.12	
	Appropriate laboratory test in the diagnosis of the infectious disease	MI8.13	Vertical Integration, Medicine, community Medicine
	Confidentiality pertaining to patient identity in laboratory results	MI8.14	
	Interpret the results of the laboratory tests used in diagnosis of the infectious disease	MI8.15	
	National Health Programs in the prevention of common infectious diseases- Vector borne diseases control program, Revised National Tuberculosis Control Program (RNTCP) and National Tuberculosis Elimination Program (NTEP) , National AIDS Control Program, National Leprosy Eradication Program, Pulse Polio Program- Poliovirus	MI8.16	Vertical Integration, community Medicine Horizontal Integration Pharmacology
	Burkholderia, Mycoplasma, Borrelia, Actinomyses&Nocardia, Rickettsia, Bortonella, Ehrlichia, Chlamydiae, Ebola virus, Slow viruses	Miscellaneous topics - may be covered in theory or SGT	Vertical Integration, Medicine
	AETCOM in Microbiology		
	Bioethics-Case studies on patient autonomy and decision making Topics : - Autonomy and Decision making : At the end of phase I student shall be able to - Define patient autonomy - Know contrast autonomy and paternalism - Know responsibilities of patients and doctors in shared decision making. - Know what is full and reasonable disclosure. - Difference between Autonomy and Beneficence. - What determines decision making capacity and competency.	MI 2.5 (6 hrs)	

	Bioethics- case studies on patient autonomy and decision making Topics:-At the end of phase II student shall be able to know Informed consent. Know what informed refusal.	MI 2.6 (5 hrs)	
	Bioethics- case studies on patient autonomy and decision making Topics:- Privacy and confidentiality	MI 2.7 (5 hrs)	

Sr.No	Topic	Competency No	Integration
MI-SDL-1	Antigen	MI 1.8	
MI-SDL-2	Plague /Brucella	MI 8.1	
MI-SDL-3	Viruses causing Diarrhea	MI 3.1	
MI-SDL-4	Upper Respiratory Tract Infections	MI 6.1	
MI-SDL-5	Bacillus species	MI 3.5	
MI-SDL-6	Mycobacterium leprae	MI 4.3	
MI-SDL-7	Biomedical Waste management	MI 8.6	
MI-SDL-8	Meningitis	MI 5.1	
MI-SDL-9	Structure and Function of Immune system	MI 1.7	
MI-SDL-10	Sexually Transmitted diseases	MI 7.2	

Sr. No.	Section 1: General Microbiology, Immunology and Hospital infection Control	Competency No	Teaching Learning method	Assessment Method	Number Required Certify
GENERAL MICROBIOLOGY					
1.	Introduction to Microbiology Department	MI 1.1	Small group teaching	Maintain logbook & Journal	
2.	Microscopy	MI 1.1, 1.2	DOAP	Maintain logbook & Journal	
3.	General Bacteriology				
	3.1 Morphology and Physiology of Bacteria	MI 1.1	Small group teaching	Maintain logbook & Journal	
	3.2 Specimen Collection and Transport	MI 8.10	Small group teaching	Maintain logbook & Journal	
	3.3 Direct Detection 1: Simple stain	MI 1.1,1.2	Small group teaching	Maintain logbook & Journal	
	3.4 Direct Detection 2 Gram stain	MI 1.2	DOAP	Skill assessment	05
	3.5 Direct Detection 3 : Special Stain **(Acid Fast stain(Z-N staining),** Albert Stain and Others) and Other Direct Detection Methods	MI 1.1,1.2,8.15	DOAP	Skill assessment	05
	3.6 Culture Media (Including Automated Culture) and Culture Methods	MI 1.1,8.15	Small group teaching	Maintain logbook & Journal	
	3.7 Identification of Bacteria (Conventional and Autoimated)	MI 1.1,8.15	Small group teaching	Maintain logbook & Journal	
	3.8 Antimicrobial Susceptibility Tests	MI 1.6	Small group teaching	Maintain logbook & Journal	
	3.9 Molecular Diagnosis	MI 8.15	Small group teaching	Maintain logbook & Journal	
4.	Laboratory Diagnosis of Viral Diseases	MI1.1,8.10,8.15	Small group teaching	Maintain logbook & Journal	
5.	Laboratory Diagnosis of Parasitic Diseases, **stool examination**	MI1.2,8.10,8.15	DOAP	Skill assessment	05
6.	Laboratory Diagnosis of Fungal Diseases	MI1.1,8.10,8.15	Small group teaching	Maintain logbook & Journal	

7.	Precipitation and Agglutination	MI 8.15	Small group teaching	Maintain logbook & Journal	
8.	ELISA, ELFA and Immunofluorescence	MI 8.15	Small group teaching	Maintain logbook & Journal	
9.	Western Blot, Rapid tests and CLIA	MI 8.15	Small group teaching	Maintain logbook & Journal	
HOSPITAL INFECTION CONTROL					
10.	Standard Precautions: Hand hygiene and PPE	MI 8.7	Small group teaching	Maintain logbook & Journal	
11.	Transmission – based Precautions	MI 8.6, 8.7	Small group teaching	Maintain logbook & Journal	
12.	Sterilization and Disinfection	MI 1.5	Small group teaching	Maintain logbook & Journal	
13.	Biomedical Waste Management	MI 8.6	Small group teaching	Maintain logbook & Journal	
14.	Needle Stick injury	MI 8.6, 8.7	Small group teaching	Maintain logbook & Journal	
15.	Environmental Surveillance	MI 8.8	Small group teaching	Maintain logbook & Journal	
SECTION 2: Systemic Microbiology (infectious Diseases)					
Blood stream and Cardiovascular System infections					
16.	Cardiovascular System Infections : Infective Endocarditis and Acute Rheumatic Fever	MI 2.3	Small group teaching	Maintain logbook & Journal	
17.	Blood stream Infections	MI 2.3,8.15	Small group teaching	Maintain logbook & Journal	
18.	Bacterial Infections of Blood stream : Enteric fever, Scrub typhus, Brucellosis , and Leptospitosis	MI3.4,8.10,8.15	Small group teaching	Maintain logbook & Journal	
19.	Viral Infections of Bloodstream: HIV/AIDS and Dengue	MI 2.7, 8.15	Small group teaching	Maintain logbook & Journal	
20.	Parastitic Infections of Blood stream : Malaria, Visceral Leishmaniasis and Lymphatic Filarisis	MI 2.6	Small group teaching	Maintain logbook & Journal	
21.	Fungal infections of Bloodstream: Systemic Candidiasis and Systemic Mycoses	MI 1.1, 8.15	Small group teaching	Maintain logbook & Journal	

GASTROINTESTINAL INFECTIONS					
22.	Bacterial Diarrhea: Diarrheagenic Escherichia coli, Shigellosis, Nontyphoidal Salmonellosis, Cholera and clostridioides difficile diarrhea	MI 3.2	Small group teaching	Maintain logbook & Journal	
23.	Viral Gastrogenteritis: rotaviruses and Others	MI 3.2	Small group teaching	Maintain logbook & Journal	
24.	Intestinal Protozoan infections: Intestinal Amoebiasis, Glardiasis, Coccidian Parasitic Infections	MI 1.2,3.2,8.15	Small group teaching	Maintain logbook & Journal	
25.	Intestinal Helminthic infections - Intestinal Cestode infections: Intestinal Taeniasis, Hymenolepiasis and Others - Intestinal Trematode infections: Fasciolopsisbuski, Schistosoma mansoni and Others - Intestinal Nematode Infections: Trichufrichuriasis, Enterobiasis, Ascariasis, Hookworm infections, strongyloidiasis	MI1.2,3.2,8.15	Small group teaching	Maintain logbook & Journal	
HEPATOBILLIARY SYSTEM INFECTIONS					
26.	Viral hepatitis	MI 3.8	Small group teaching	Maintain logbook & Journal	
27.	Parasitic infections of Hepatobillary System: Amoebic Liver Abscess, Hydatid Disease (Echinococcosis and Others)	MI3.1,3.2	Small group teaching	Maintain logbook & Journal	
SKIN SOFT TISSUE AND MUSCULOSKELETAL SYSTEM INFECTIONS					
28.	Staphylococcal infections	MI 4.2,4.3,1.2	Small group teaching	Maintain logbook & Journal	
29.	Beta-hemolytic Streptococcal infections	MI 4.3,1.2	Small group teaching	Maintain logbook & Journal	
30.	Miscellaneous Bacterial Infections of Skin and Soft Tissues: Anaerobic infections including Gas gangrene, Leprosy and Anthrax	MI 4.3, 1.2, 8.10,8.15	Small group teaching	Maintain logbook & Journal	
31.	Viral Exanthems and Other Cutaneous Viral infections. Herpes simplex, Measles, rubella and Others	MI 4.3,8.10,8.15	Small group teaching	Maintain logbook & Journal	
32.	Superficial and Subcutaneous Fungal infections	MI 4.3,8.10,8.15	Small group teaching	Maintain logbook & Journal	
RESPIRATORY TRACT INFECTIONS					
33.	Bacterial Pharyngitis: Streptococcus pyogenes, Pharyngitis and Diphtheria	MI 6.2,8.10,8.15	Small group teaching	Maintain logbook & Journal	

34.	Bacterial Pneumonia: Pneumococcal Pneumonia, Haemophilusinfluenzae Pneumonia Klebsiellapneumonlae Pneumonia and Others	MI 6.3,1.2,8.10, 8.15	Small group teaching	Maintain logbook & Journal	
35.	Tuberculosis	MI 6.3,8.15	Small group teaching	Maintain logbook & Journal	
36.	Pseudomonas and Acinetobacter Infections	MI 6.3	Small group teaching	Maintain logbook & Journal	
37.	Viral infections of Respiratory tract: influenza, COVID-19 , infectious Mononucleosis and Others	MI 6.2,6.3	Small group teaching	Maintain logbook & Journal	
38.	Parasitic and Fungal Infections of Respiratory Tract: Paragonimilasis, Zygomycosis, Aspergillosis, Pneumocystosis and Others	MI 6.2,6.3	Small group teaching	Maintain logbook & Journal	
CENTRAL NERVOUS SYSTEM INFECTIONS					
39.	Bacterial Meningitis	MI 5.3,1.2,8.10, 8.15	Tutorial	Maintain logbook & Journal	
40.	Viral Meningitis and Viral Encephalitis (Enteroviruses including Polio, Rabies, Japanese Encephalitis and Others)	MI1.1,5.3,8.1 5	Small group teaching	Maintain logbook & Journal	
41.	Parasitic and Fungal Infections of Central Nervous System: Neurocysticercosis, Free- ;living Amoebae infections, Toxoplasmosis, Cryptococcal Meningitis and Others	MI1.1,5.1,5.3 ,8.15	Small group teaching	Maintain logbook & Journal	
UROGENITAL TRACT INFECTIONS					
42.	Urinary Tract infections	MI 7.3,8.10,8.15	Tutorial	Maintain logbook & Journal	
43.	Infective Syndromes of Genital Tract (Sexually-transmitted infections), Syohillis, Gonorrhoea, Non-gonococcal Urethritis (Chlamydia, trachamatis), Vulvovaginitis (Trichomonlasis, Vaginal Candidiasis) and Others	MI 7.1,7.2,8.10, 8.15	Small group teaching	Maintain logbook & Journal	
MISCELLANEOUS					
44.	Vaccines	MI 1.9	Seminar	Maintain logbook & Journal	
45.	AETCOM in Microbiology	MI 8.11, 8.14	Small group teaching	Maintain logbook & Journal	

NATURE OF THEORY EXAMINATION PAPER

First Internal Assessment - Examination Pattern				
Section	**Type of question**	**Number of questions**	**Marks to each question**	**Total marks**
A	MCQs	20	01	20
B	Short Answer Questions	12 (out of 13)	05	60
C	Structured long answer questions	2 (out of 3)	10	20
Total Marks				**100**

Second Internal Assessment - Examination Pattern				
Section	**Type of question**	**Number of questions**	**Marks to each question**	**Total marks**
A	MCQs	20	01	20
B	B1. AETCOM B2. Short Answer Questions	1 (compulsory) 11 (out of 12)	05 05	05 55
C	Structured long answer questions	2 (out of 3)	10	20
Total Marks				**100**

Preliminary / University – Paper I- Examination Pattern				
Section	**Type of question**	**Number of questions**	**Marks to each question**	**Total marks**
A	MCQs	20	01	20
B	B1. AETCOM B2. Short Answer Questions	1 (compulsory) 11 (out of 12)	05 05	05 55
C	Structured long answer questions	2 (out of 3)	10	20
Total Marks				**100**

Preliminary / University – Paper II- Examination Pattern				
Section	**Type of question**	**Number of questions**	**Marks to each question**	**Total marks**
A	MCQs	20	01	20
B	Short Answer Questions	12 (out of 13)	05	60
C	Structured long answer questions	2 (out of 3)	10	20
Total Marks				**100**

Practical first internal assessment examinations (100 marks)

Subject Microbiology - Term -I										Grand Total
Seat No	Spots	OSPE Gram staining PBS	Serology	Clinical Microbiology, Applied exercise	Total	Journal/Log book	Oral/Viva		Total	Practical and Oral/Viva
							Viva 1	Viva II		
Max. Marks	20	20	10	20	70	10	10	10	30	100

Practical second internal assessment examinations (100 marks)

Subject Microbiology- Term-II									Grand Total
Spot	Z-N stain	Stool- Routine Microscopy	Clinical Microbiology, Applied exercise	Total	Journal/Log book	Viva		Total	Practical and Oral/Viva
						Viva I	Viva II		
20	15	15	20	70	10	10	10	30	100

Practical Preliminary/University examinations (100 marks)

Subject Microbiology													
	Practical								Oral/Viva				Grand Total
	Spots	Gram/Z-N Staining	Stool-Routine Microscopy	Hospital Infection Control	Serology	Clinical Microbiology, Applied exercise		Total of Practical	Viva I	Viva II	Journal /Log book	Total of Viva	Practical and Oral (G+K)
						Sample collection and transport	Interpretations of reports						
	A	B	C	D	E	F		G	H	I	J	K	L
Max. Marks	10	10	10	10	100	10	10	70	10	10	10	30	100

Term wise Topic Distribution

First Internal Assessment Examination Syllabus	
General Microbiology –Historical aspect, Microscopy, Sterilization, Infection, Diagnostic Microbiology General Bacteriology – Morphology and Physiology of Bacteria, Bacterial Genetics Vaccines Blood and CVS infection:- Part- I organisms causing anemia, HIV, Streptococci (Rheumatic fever), Infective Endocarditis (Blood culture), Toxoplasma, Schistosoma, Filarasis, Enteric Fever, Plague/Brucella General Mycology – Introduction to Mycology and general laboratory diagnosis of fungi.	Immunology – Immunity, structure and function of immune system., complement, Antigen, Antibody, Autoimmunity and Immunodeficiency, Antibody Mediated Immunity, Cell Mediated Immunity, Hypersensitivity, Transplant immunity, serological reactions. General Virology – General Properties of Viruses, Lab diagnosis of viruses. General Parasitology- Introduction to Parasitology and general laboratory diagnosis of Parasitology

Second Internal Assessment examination syllabus	
Gastrointestinal infections-*E.coli, V. Cholera, Food poisoning, Yersinia, H.pylori, Compylobacter, Hepatitis Viruses causing diarrhoea, cestodes, Trematodes, Intestinal nematodes,* **Respiratory Tract Infection**:-*C.diphtheriae, Myxo virus, SARS, Corona, Rhino Viruses, M.tuberculosis, streptococcus Pneumoniae, Atypical mycobacteria ,Chlamydia, Mycoplasma.* Antibiotic stewardship. AETCOM	Viruses causing hemorrhagic fever, **Blood &CVS**:- Leptospira, Borrelia, Arboviruses, Zika Viruses, Rickettsia, PUO. Miscellaneous bacteria and Viruses **Genito-urinary system-** Syphilis, Uropathogenic, *E.coli, LGV, Gardionella, Ureaplasma, Candida, Trichomonas, Niesseriagonorrhoea* National health Programs

Preliminary Examination and University Examination syllabus	
Paper-I	
1. General Microbiology 2. Immunology 3. AETCOM	1. Infections of bloodstream and cardiovascular system, 2. Infections of gastrointestinal tract 3. Infections of Hepatobiliary system
Paper-II	
1. Infections of skin, soft tissue and musculoskeletal system 2. Infections of Respiratory system 3. Hospital infection control	1. Infections of central nervous system 2. Infections of genitourinary 3. Sexually transmitted infections 4. Miscellaneous infective syndrome

Note: - attempt should be made to maintain appropriate proportion of questions from

PAPER-I

1. General Microbiology- 30 Marks
2. Immunology - 20 Marks
3. CVS & Bloodstream infections - 23 marks,
4. Gastrointestinal tract infections – 25 Marks
5. Hepatobiliary system infections- 12 Marks
6. AETCOM- 5 marks

Total- 115 Marks

Paper-II

1. Skin & Soft tissue infections - 24 Marks
2. Respiratory infections – 29 Marks
3. Central Nervous System Infections -24 Marks
4. Genitourinary Tract Infections - 19 Marks
5. Hospital Infection Control – 12 Marks
6. Miscellaneous syndromes – 7 Marks

Total 115 Marks

INTERNAL ASSESSMENT

Phase	I-Exam (June)			II-Exam (September)			Prelim (December)		
	Theory	**Practical (Including 10 Marks for Journal & Log Book)**	**Total Marks**	**Theory**	**Practical (Including 10 Marks for Journal & Log Book)**	**Total Marks**	**Theory**	**Practical**	**Total Marks**
Second MBBS	100	100	200	100	100	200	Paper I-100 Paper II -100	100	300

Eligibility criteria:

a. There will be **3 internal assessment examinations** in Microbiology. The structure of the internal assessment theory examinations should be similar to the structure of University examinations.

b. It is **mandatory for the students to appear for all the internal assessment examinations.**

c. First internal assessment examination will be held in June, second internal assessment examination will be held in September and third internal assessment examination will be held in December.

d. **A student who has not scored minimum required number of marks for Internal Assessment each in theory and practical will not be eligible for University examination.**

e. There will be **only one additional examination for absent students (due to genuine reason) after approval by the Institutional Grievances Committee.** It should be taken after preliminary examination and before submission of internal assessment marks to the University.

f. Internal assessment marks for theory will be out of 400 and practical will be out of 300.

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

Passing criteria:

a. **Complete passing in phase I examination** is compulsory before proceeding to phase II.
b. A student who fails in the **second year course examination should not be allowed to appear for III phase examination** unless he /she passes all the subjects of second year course.
c. The students must secure at least 50 % marks of total marks (combined theory & practical /clinical) and not less than **40 % marks in theory and practical separately** assigned for particular internal assessment.
d. **Additional Internal assessment** examination for non-eligible students (less than 50 % combined in theory and practical or 40% separately) will be conducted after prelims and before submission of internal assessment marks.
e. **Student who will not be eligible after additional internal examination will appear with next regular batch as repeater student.**

Supplementary examination

Supplementary examination should be conducted within 4- 6 weeks after University result.

1. **Conversion Formula for calculation of marks in internal assessment examinations.**

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% separately in Theory & Practical, 50% Combined)	
Theory	100	100	200	400	Total marks obtained (Divide by10)	16 (Minimum)	Total of Theory + Practical Must be 40.
Practical	100	100	100	300	Total marks obtained (Divide by 7.5)	16 (Minimum)	

1. While preparing Final Marks of Internal Assessment, the rounding-off marks shall do as illustrated in following table

Internal Assessment Marks	Final rounded marks
15.01 to 15.49	15
15.50 to 15.99	16

2. Internal assessment marks will reflect as separate head of passing at the summative examination.

3. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

Learning Resource Material Books in Microbiology

Textbooks recommended:

1. Essentials of practical Microbiology as per the competency based Medical Education Curriculum (CBME), Apurba Sastry and Sandhya Bhat;3rd Edition Publisher, Jaypee Brothers Medical Publishers (P) Ltd.
2. Textbook of Microbiology as per the CBME curriculum – R. Ananthanarayan C.K. Jayaram Panikar, 13th Edition, Universities press (India) Private limited, Telangana, India
3. Complete Microbiology for MBBS as per the Revised competency based Medical Education Curriculum (CBME) including clinical Case presentations and MCQs, - CP Baveja and V Baveja; 7th Edition, Avichal Publishing Company, HP, India.
4. Essentials of Medical Microbiology- Apurba Shashtry and Sandhya Bhat; 2nd Edition Publisher, Jaypee Brothers Medical Publishers (P) Ltd
5. Textbook of Microbiology as per the CBME curriculum – R. Ananthanarayan C.K. Jayaram Panikar, 10th Edition, Universities press (India) Private limited, Telangana, India
6. Parasitology 13th Edition 2009 By KD Chatterjee,
7. Practical And Applied Microbiology-Anuradha De-5Th Edition-2019, The National Book depot, Mumbai.

Reference Books:

1. Medical Mycology (Emmons) – Kwon – Chung
2. Essentials of Microbiology and Immunology through questions and answers SK Mohanty, K Sai Leela, 1st edition, Paras Book Publisher
3. Prescott's Microbiology, Joanne Willey and Linda Sherwood and Christopher J. Woolverton 10th Edition Publisher
4. Essentials of Hospital Infection Control Apruba S Sastry and Depashree R, Jaypee Brothers Medical Publishers (P) Ltd
5. Competency based Practical Manual for Microbiology as per competency based Medical Education Curriculum (CBME) Upasana Bhumbla, Jaypee Brothers Medical Publishers (P) Ltd

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