

# STUDY GUIDE

## Block - VII

- I. Foundation-I & EBM
- II. General & Clinical Pharmacology
- III. Hematopoietic, Immunity & Transplant
- IV. Forensic Medicine & Toxicology-I

3<sup>rd</sup> Year MBBS



Department of Medical Education  
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## 1. List of Abbreviations

<u>List of Abbreviations</u>	
Abbreviations	Subjects
A	Anatomy
ABCDE	Airway, Breathing, Circulation, Disability, Exposure
ABG	Arterial Blood Gas
ACS	Acute Coronary Syndromes
Ag	Aging
AKI	Acute Kidney Injury
ALT	Alanine Transaminase
AMI	Acute Myocardial Infarction
AMP	Adenosine Monophosphate
ANA	Antinuclear Antibody
ANCA	Antineutrophil Cytoplasmic Antibodies
ANS	Autonomic Nervous System
AO	Association of Osteosynthesis
APTT	Activated Partial Thromboplastin Clotting Time
ARDS	Acute Respiratory Distress Syndrome
ARVC	Arrhythmogenic Right Ventricular Cardiomyopathy
ASD	Atrial Septal Defect
AST	Aspartate Aminotransferase
ATLS	Advanced Trauma Life Support
Au	Autopsy
AUC	Area Under The Curve
AV	Atrioventricular
B	Biochemistry
BhS	Behavioral Sciences
BHU	Basic Health Unit
BSL	Biological Safety Level
C	Civics
C-FRC	Clinical-Foundation Rotation Clerkship

C. burnetii	Coxiella burnetii
C. neoformans	Cryptococcus neoformans
C. pneumoniae	Chlamydia pneumoniae
C. psittaci	Chlamydia psittaci
C. trachomatis	Chlamydia trachomatis
CA	Cancer
CABG	Coronary Artery Bypass Grafting
CAD	Coronary Artery Disease
CBC	Complete Blood Count
CCR5	Cysteine-Cysteine Chemokine Receptor 5
CD31	Cluster of Differentiation 31
CD34	Cluster of Differentiation 34
CD4	Clusters of Differentiation 4
CF	Cystic Fibrosis
CK	Creatine Kinase
CK	Creatine Kinase
CLED	Cystine Lactose Electrolyte Deficient
CLL	Chronic Lymphocytic Leukemia
CM	Community Medicine
CML	Chronic Myelogenous Leukemia
CMV	Cytomegalovirus
CNS	Central Nervous System
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CODIS	Combined Dna Index System
COPD	Chronic Obstructive Pulmonary Disease
COVID-19	Corona Virus Disease 2019
COX	Cyclooxygenase
CPR	Cardio Pulmonary Resuscitation
CR	Clinical Rotation
CRP	C- Reactive Protein

CSF	Cerebrospinal Fluid
CT	Computed Tomography
CT	Computerized Tomography
CV	Cardiovascular
CVA	Cerebral Vascular Accident
CVDs	Cardiovascular Diseases
CVS	Cardiovascular System
D. medinensis	Dracunculus Medinensis
DALY	Disability-Adjusted Life Year
DCIS	Ductal Carcinoma in situ
DCM	Dilated Cardiomyopathy
DCMLS	Dorsal Column Medial Lemniscus System
DLC	Differential Leukocyte Count
DMARDs	Disease-modifying antirheumatic drugs
DNA	Deoxy Ribonucleic Acid
DOTS	Directly Observed Treatment Short-course
DTP	Diphtheria, Tetanus, Pertussis
DVI	Disaster Victim Identification
DVT	Deep Vein Thrombosis
E. coli	Escherichia coli
ECF	Extra Cellular Fluid
ECG	Electrocardiography
ECG	Electocardiogram
ECP	Emergency contraceptive pills
ED50	Median Effective Dose
EEG	Electroencephalogram
EIA	Enzyme Immunoassay
ELISA	Enzyme Linked Immunosorbent Assay
EnR	Endocrinology & Reproduction
ENT	Ear Nose Throat
EPI	Expanded Programme on Immunization

ER	Emergency Room
F	Foundation
FAST	Focused Assessment with Sonography in Trauma
FEV1	Forced Expiratory Volume 1
FM	Family Medicine
For	Forensics Medicine
FPIA	Fluorescent Polarization Immunoassay
FS	Forensic Serology
FSc	Forensic Science
FVC	Forced Vital Capacity
GCS	Glasgow Coma Scale
GFR	Glomerular Filtration Rate
GIT	Gastrointestinal tract
GL-MS	Gas Liquid Mass Spectrometry
GLC	Gas Liquid Chromatography
GLP	Good Laboratory Practice
GMP	Guanosine Monophosphate
GO	Gynecology and Obstetrics
GP	General Practitioner
GPE	General Physical Examination
GTO	Golgi Tendon Organ
Gynae & Obs	Gynecology and Obstetrics
H & E	Hematoxylin and Eosin
H. influenzae	Haemophilus influenzae
H. pylori	Helicobacter pylori
HAI	Healthcare Associated Infections
HbC	Hemoglobin C
HbS	Sickle Hemoglobin
HbSC	Hemoglobin Sickle C Disease
HCL	Hydrochloric Acid
HCM	Hypertrophic Cardiomyopathy

HHV	Human Herpesvirus
HIT	Hematopoietic, Immunity and Transplant
HIV	Human Immunodeficiency Virus
HL	Hematopoietic & Lymphatic
HLA	Human Leukocyte Antigen
HMP	Hexose Monophosphate
HNSS	Head & Neck and Special Senses
HPLC	High Pressure Liquid Chromatography
ICF	Intra Cellular Fluid
ID	Infectious Diseases
IE	Infective Endocarditis
IL	Interleukin
ILD	Interstitial Lung Disease
IN	Inflammation
INR	International Normalized Ratio
INSTIs	Integrase Strand Transfer Inhibitors
IPV	Inactivated Poliovirus Vaccine
IUD	Intrauterine Device
IUGR	Intra Uterine Growth Restriction
JVP	Jugular Venous Pulse
L	Law
LD50	Median Lethal Dose
LDH	Lactate Dehydrogenase
LSD	Lysergic acid diethylamide
M	General Medicine
MALT	Mucosa Associated Lymphoid Tissue
MBBS	Bachelor of Medicine, Bachelor of Surgery
MCH	Mean corpuscular hemoglobin
MCHC	Mean Corpuscular Hemoglobin Concentration
MCV	Mean Corpuscular Volume
MHO 2001	Mental Health Ordinance 2001

MoA	Mechanism of action
MRI	Magnetic resonance imaging
MS	Musculoskeletal
MSD	Musculoskeletal disorders
MSDS	Minimum Service Delivery Standards
MSK	Musculoskeletal
N	Neoplasia
NEAA	Non-Essential Amino Acids
NK cells	Natural Killer Cells
NMJ	Neuro Muscular Junction
NNRTIs	Non-nucleoside Reverse Transcriptase Inhibitors
NRTIs	Nucleoside Reverse Transcriptase Inhibitors
NS	Neurosciences
NSAIDs	Non-steroidal Anti-Inflammatory Drugs
O	Ophthalmology
OA	Osteoarthritis
OPC	Organophosphate
OPV	Oral poliovirus vaccine
Or	Orientation
Orth	Orthopedic
P	Physiology
P. jiroveci	Pneumocystis jiroveci
Pa	Pathology
PAD	Peripheral Artery Disease
PAF	Platelet Activating Factor
PBL	Problem Based Learning
PCI	Percutaneous Coronary Intervention
PCR	Polymerase Chain Reaction
PDA	Patent Ductus Arteriosus
PDGF	Platelet Derived Growth Factor
Pe	Pediatrics

PEM	Protein Energy Malnutrition
PERLs	Professionalism, Ethics, Research, Leadership
PET	Positron Emission Tomography
Ph	Pharmacology
pH	potential Hydrogen
PI	Personal Identity
PID	Pelvic inflammatory disease
PIs	Protease inhibitors
PMC	Pakistan Medical Commission
PMDC	Pakistan Medical and Dental Council
PMI	Post-Mortem Interval
PNS	Peripheral Nervous System
PPD	Paraphenylenediamine
PPE	Personal Protective Equipment
Psy	Psychiatry
PT	Prothrombin Time
PVC	Premature Ventricular Contraction
PVD	Peripheral Vascular Diseases
QALY	Quality-Adjusted Life Year
QI	Quran and Islamiyat
R	Renal
Ra	Radiology
RA	Rheumatoid Arthritis
RBCs	Red Blood cells
RCM	Restrictive Cardiomyopathy
RDA	Recommended Dietary Allowance
Re	Respiratory
RF	Rheumatoid factor
RFLP	Restriction Fragment Length Polymorphism
Rh	Rheumatology
RHC	Rural Health Center

RIA	Radioimmunoassay
RMP	Resting Membrane Potential
RNA	Ribonucleic Acid
RTA	Road Traffic Accident
S	General Surgery
S. pneumonia	Streptococcus pneumoniae
SA	Sinoatrial
SCC	Squamous-cell carcinoma
Se	Sexology
Sec	Section
SIDS	Sudden Infant Death Syndrome
SLE	Systemic Lupus Erythematosus
SOP	Standard Operating Procedure
TB	Tuberculosis
TBI	Traumatic Brain Injury
TCA	Tricarboxylic acid cycle
TCBS	Thiosulphate Citrate Bile salts Sucrose
TD50	Median Toxic Dose
TGA	Transposition of the Great Arteries
Th	Thanatology
TLC	Thin Layer Chromatography
TNF	Tumor Necrotic Factor
TNM	Tumor, Node, Metastasis
TOF	Tetralogy of Fallot
Tox	Toxicology
Tr	Traumatology
TSI	Triple Sugar Iron
USG	Ultrasonography
UTI	Urinary Tract Infections
UV	Ultraviolet
VAP	Ventilator-Associated Pneumonia

Vd	Volume of Distribution
VEGF	Vascular Endothelial Growth Factor
VSD	Ventricular Septal Defect
W. bancroft	Wuchereria bancroft
WBCs	White Blood Cells
WHO	World Health Organization
ZN Staining	Ziehl-Neelsen Staining



## **2. Introduction to Study Guide**

The study guide serves several crucial purposes:

### **1. Communicating information on the organization and management of the module:**

This aids students in identifying the appropriate point of contact in case they encounter any difficulties during the semester.

### **2. Defining the objectives expected to be achieved by the end of the module:**

It outlines clear learning goals, ensuring that students understand what is expected of them academically.

### **3. Identifying the learning strategies employed to achieve module objectives:**

These strategies may encompass various methods such as lectures, small group sessions, clinical skills practice, demonstrations, tutorials, and case-based learning.

### **4. Providing a list of learning resources:**

Students are offered a comprehensive list of resources, including books, computer-assisted learning programs, web links, and journals. These resources empower students to maximize their learning potential.

### **5. Highlighting information on the contribution of continuous assessment and semester examinations:**

This section emphasizes the significance of ongoing assessments and final exams in determining a student's overall performance in the module.

### **6. Including information on assessment methods:**

Details about the various assessment methods employed to evaluate students' progress in achieving the objectives are outlined.

### **7. Focusing on examination policies, rules, and regulations:**

This section clarifies the policies and regulations governing examinations, ensuring that students are well-informed about the rules they must adhere to during their assessments.

By providing students with this comprehensive guide, educational institutions aim to enhance their learning experience, facilitate effective academic management, and foster compliance with academic standards and regulations.



### 3. Block-7 Module Committee

BASIC HEALTH SCIENCES	CLINICAL SCIENCES
<b>Anatomy:</b> Prof. Dr. Quddus Ur Rehman	<b>Medicine:</b> Prof. Dr. Ghulam Abbas Sheikh
<b>Physiology:</b> Assoc. Prof. Dr. Benash Altaf.	<b>Surgery:</b> Prof. Dr. Zikriya
<b>Biochemistry:</b> Prof. Dr. Shakeel Ahmad Dr. Saira Saad	<b>Radiology:</b> Asst. Prof. Dr. Shemona
<b>Community Medicine:</b> Prof. Dr. Humayun Suqrat	<b>Gynecology:</b> Prof. Dr. Nazia Mussarat
<b>Pathology:</b> Prof. Dr. Kashif Baig	
<b>Pharmacology:</b> Dr. Sarwat Jahan	
<b>Behavioral Sciences:</b> Dr. Yawar	
<b>Block Coordinator</b>	<b>Dr. Ramsha</b>
<b>Medical Educationist</b>	<b>Asst. Prof. Dr. Ayesha Sadiq</b>
<b>Principal AFMDC</b>	<b>Prof. Dr. Ghulam Abbas Sheikh</b>

#### **4. Introduction of BLOCK VII**

The third year of MBBS marks a pivotal transition from pre-clinical learning to a more integrated clinical approach. This phase emphasizes the application of foundational knowledge to patient care and real-world medical scenarios. The following four modules **Foundation-II & Evidence-Based Medicine, General & Clinical Pharmacology, Hematopoietic, Immunity & Transplant, and Forensic Medicine & Toxicology-I** are designed to develop clinical reasoning, rational therapeutics, and medicolegal awareness in budding physicians.

##### **Foundation-II & Evidence-Based Medicine (EBM)**

This module strengthens the link between basic sciences and clinical practice. Foundation-II focuses on understanding disease mechanisms within organ systems, correlating pathology with clinical signs and symptoms. Students are trained to think critically, approach cases systematically, and integrate interdisciplinary knowledge.

The EBM component equips students with essential skills to analyse medical literature and apply clinical research in decision-making. Students learn to assess the quality of evidence, interpret statistical outcomes, and practice medicine grounded in the best available data.

- Enhance clinical reasoning and case-based diagnostic thinking
- Understand research design, bias, and validity
- Interpret statistical outcomes in clinical literature
- Apply evidence in therapeutic and diagnostic decisions

##### **General & Clinical Pharmacology**

Pharmacology is central to safe and effective patient care. This module introduces the principles of drug action, including pharmacokinetics (how the body affects a drug) and pharmacodynamics (how the drug affects the body). Students are exposed to the major drug classes, therapeutic applications, and the rational basis of treatment protocols.

The clinical aspect bridges theoretical knowledge with practical prescribing. Emphasis is placed on adverse drug reactions, drug interactions, prescribing in special populations, and personalized medicine.

- Understand mechanisms, classifications, and clinical uses of drugs
- Develop safe prescribing habits aligned with current guidelines
- Recognize and manage adverse effects and drug interactions
- Apply pharmacological knowledge in patient-centered care

### **Hematopoietic, Immunity & Transplant Module**

This module delves into the physiology and pathology of the hematologic and immune systems, covering conditions such as anemia, leukemias, bleeding disorders, autoimmune diseases, and immunodeficiencies. Emphasis is placed on interpreting diagnostic investigations, such as peripheral blood smears, bone marrow biopsy, and immunological assays.

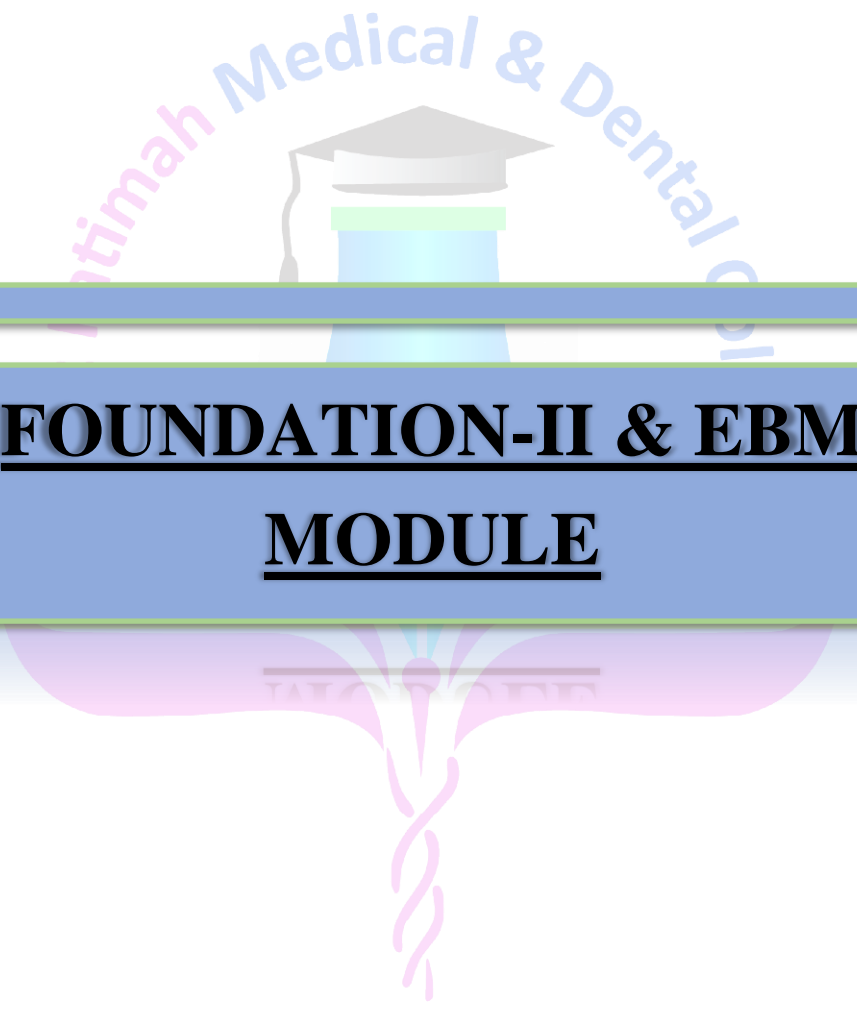
The transplant medicine component explores organ and stem cell transplantation, graft rejection, and immunosuppressive therapies. Clinical relevance is ensured through case discussions and integration with pharmacology and pathology.

- Understand hematologic and immune system disorders
- Interpret laboratory findings and apply them clinically
- Comprehend immunological principles in transplant rejection
- Learn therapeutic approaches including immunosuppressants and biological.

### **Forensic Medicine & Toxicology-I**

This module introduces the interface between medicine and the law. Students explore the medico-legal responsibilities of a physician, principles of forensic pathology, and basics of toxicology. It covers identification methods, postmortem changes, cause-of-death analysis, and documentation required in legal cases. Toxicology includes the study of poisons, clinical presentation of toxicity, and general principles of antidotal therapy. Ethical considerations and medical jurisprudence are also emphasized, preparing students for medico-legal duties in clinical settings.

- Understand legal aspects of medical practice
- Perform and interpret findings from postmortem examinations
- Identify common poisons and their clinical management
- Apply ethical principles and legal protocols in medical practice.



**FOUNDATION-II & EBM**  
**MODULE**

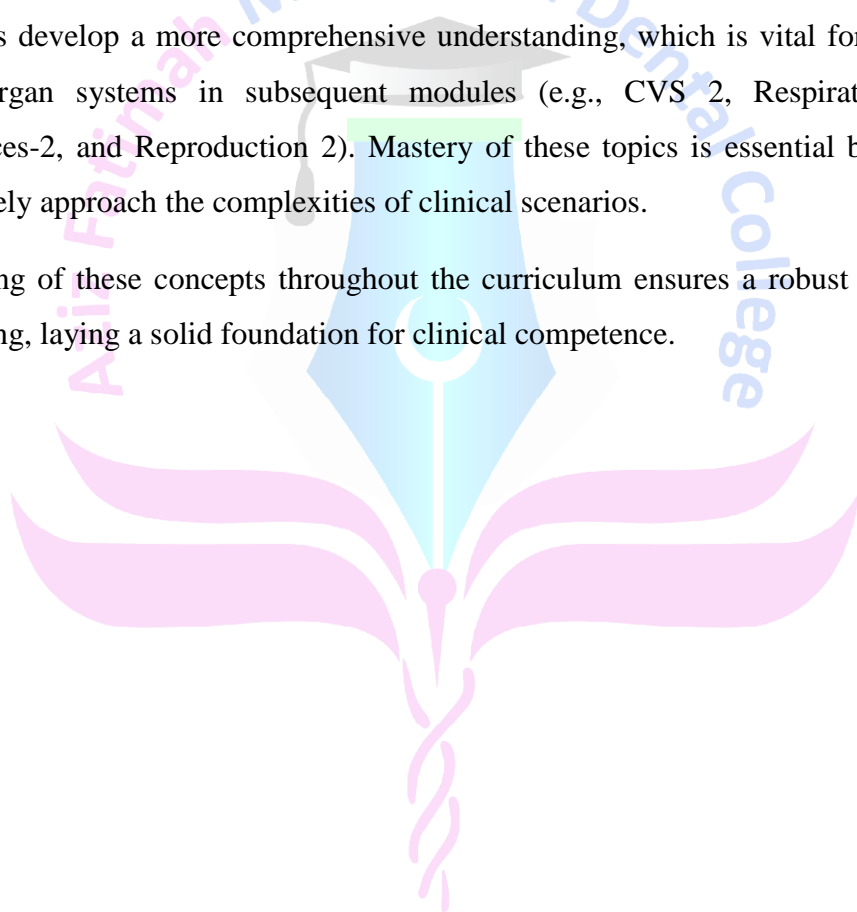
## **5. Foundation-II & EBM**

### **5.1 Module Rationale**

The Foundation 2 module is designed to build upon and consolidate the foundational knowledge acquired in the earlier years of medical education, particularly from the Foundation-I module. As students transition into their clinical years, it is crucial to reinforce and deepen their understanding of basic medical sciences to support the integration of new, clinically relevant concepts.

This module serves as a bridge, revisiting core topics in general Pharmacology, Pathology, and Forensic medicine with an emphasis on their clinical applications. By doing so, it ensures that students develop a more comprehensive understanding, which is vital for the advanced study of organ systems in subsequent modules (e.g., CVS 2, Respiratory-2, GIT-2, Neurosciences-2, and Reproduction 2). Mastery of these topics is essential before students can effectively approach the complexities of clinical scenarios.

The revisiting of these concepts throughout the curriculum ensures a robust and integrated understanding, laying a solid foundation for clinical competence.



## 5.2 Module Outcomes

- Apply Integrated Knowledge of Basic and Clinical Sciences: Synthesize concepts from general Pharmacology, Pathology, and Forensic Medicine to better understand the physiological and pathological processes underlying common clinical conditions. Correlate the foundational knowledge of disease mechanisms with their clinical presentations in Surgery and Medicine.
- Demonstrate Competency in Core Pharmacological Principles: Understand and explain the pharmacokinetics and pharmacodynamics of commonly used drugs in clinical practice. Analyze drug interactions, adverse effects, and therapeutic uses in various organ systems, including cardiovascular, respiratory, gastrointestinal, and neurological systems.
- Interpret Pathological Findings: Interpret key pathological processes such as inflammation, infection, neoplasia, and tissue repair in the context of disease progression. Apply knowledge of histopathology and laboratory medicine in diagnosing common diseases seen in clinical practice.
- Apply Forensic Medicine Principles in Clinical Contexts: Demonstrate understanding of medicolegal aspects of medical practice, including documentation, consent, patient rights, and legal responsibilities. Analyze and interpret findings relevant to forensic medicine, such as injury patterns, cause of death, and toxicology, and understand their clinical significance.
- Develop Surgical and Medical Clinical Reasoning: Utilize foundational knowledge to assess and plan appropriate management strategies for common surgical and medical conditions. Integrate surgical principles with an understanding of anatomy and pathology to explain clinical presentations and operative approaches.
- Practice Patient Safety Principles: Identify potential risks to patient safety in clinical settings, including medication errors, procedural risks, and diagnostic mistakes. Apply strategies to mitigate risks and promote patient safety, including adhering to clinical guidelines, infection control measures, and communication best practices.
- Demonstrate Ethical and Professional Conduct: Recognize the importance of ethical decision-making and professionalism in both clinical practice and forensic medicine. Engage in responsible clinical practice, demonstrating accountability, integrity, and respect for patient autonomy and confidentiality.
- Employ Critical Thinking and Problem-Solving Skills: Use clinical reasoning to solve complex problems related to pharmacological treatment plans, pathological diagnoses,

and surgical management. Analyze case scenarios that integrate knowledge across multiple subjects, drawing from basic and clinical sciences to reach accurate clinical conclusions.

- **Communicate Effectively in Multidisciplinary Teams:** Demonstrate the ability to collaborate and communicate clearly with peers and healthcare professionals from various specialties. Present clinical findings, diagnoses, and management plans effectively in both written and verbal formats, ensuring clarity and precision.



### 5.3 Learning Objectives

#### 5.3.1 Knowledge

#### PHARMACOLOGY

Topic	Sub Topic	Learning objectives
Pharmacology	Introduction	<ol style="list-style-type: none"> <li>1. Define Pharmacology, different branches of Pharmacology, Drug Nomenclature and Pharmacopoeias</li> </ol>
	Sources of drugs and active principles	<ol style="list-style-type: none"> <li>1. Identify the Sources &amp; Active Principles of Drugs with Clinical Applications of Active Principles.</li> <li>2. Describe different sources of drugs.</li> <li>3. Tabulate differences between fixed oils and volatile oils as sources of drugs.</li> </ol>
	Parameters	<ol style="list-style-type: none"> <li>1. Summarize definitions of various pharmacokinetic and pharmacodynamics parameters</li> </ol>
	Routes of Administration	<ol style="list-style-type: none"> <li>1. Name various routes of drug administration.</li> <li>2. Discuss the advantages &amp; disadvantages of various routes of drug administration.</li> <li>3. Describe the factors that influence the route of administration of a drug.</li> <li>4. Understand the Clinical Relevance of the Selection of Routes of Administration</li> </ol>
	Permeation	<ol style="list-style-type: none"> <li>1. Enlist the different processes by which drugs are transported across cell membranes.</li> <li>2. Describe and differentiate each transport process</li> </ol>
	Absorption	<ol style="list-style-type: none"> <li>1. Describe drug absorption</li> <li>2. Describe drug-based factors affecting rate and extent of drug absorption.</li> </ol>

		<ol style="list-style-type: none"> <li>3. Predict the relative permeation of a clinically useful weak acid or a weak base from knowledge of its pKa, the pH of the medium using the Henderson Hassel Balch equation.</li> <li>4. Determine percentage of drug ionized or unionized when placed in a certain Ph. media.</li> <li>5. Explain ion trapping.</li> <li>6. Describe patient-based factors affecting rate and extent of drug absorption.</li> <li>7. Describe the Clinical Significance of Drug Absorption.</li> </ol>
	<p>Bioavailability and first pass effect</p>	<ol style="list-style-type: none"> <li>1. Define Bioavailability.</li> <li>2. Describe factors affecting bioavailability.</li> <li>3. Define Area under the curve (AUC).</li> <li>4. Explain first pass elimination.</li> <li>5. Explain extraction ratio.</li> <li>6. Understand that how bioavailability and the first pass effect, affect the different Clinical conditions.</li> <li>7. Explain bioequivalence and therapeutic equivalence.</li> </ol>
	<p>Distribution</p>	<ol style="list-style-type: none"> <li><u>1.</u> Define drug distribution.</li> <li><u>2.</u> Describe the distribution of a drug through various body compartments.</li> <li><u>3.</u> Explain selective distribution.</li> <li><u>4.</u> Describe factors affecting distribution of a drug.</li> <li><u>5.</u> Explain volume of distribution (Vd) and how to calculate Vd. understand the clinical significance of Vd</li> </ol>

		<p><b>6.</b> Explain the characteristics of a drug that is bound to plasma proteins.</p> <p><b>7.</b> Describe the clinical consequences of displacement of a drug from plasma protein binding.</p>
	Metabolism and biotransformation	<p><b>1.</b> Explain metabolism and biotransformation.</p>
	Metabolism and biotransformation	<p><b>1.</b> Describe the aims and outcomes of metabolism and biotransformation</p> <p><b>2.</b> Explain a 'prodrug'</p> <p><b>3.</b> Enlist and describe characteristics of Phase 1 and Phase 2 reactions of biotransformation.</p> <p><b>4.</b> Describe microsomal and non-microsomal biotransformation reactions</p> <p><b>5.</b> Describe the microsomal oxidation system.</p> <p><b>6.</b> Explain Hoffman's elimination.</p> <p><b>7.</b> Describe factors affecting metabolism &amp; biotransformation</p> <p><b>8.</b> Describe the clinical significance of enzyme induction and enzyme inhibition with their examples.</p> <p><b>9.</b> Describe the clinical significance of metabolism &amp; biotransformation.</p> <p><b>10.</b> Describe clinical significance of enterohepatic recycling of drugs.</p>
	Elimination	<p><b>1.</b> Define Plasma Half-Life, and understand the concept of plasma half-life.</p> <p><b>2.</b> Describe factors affecting half-life and clinical significance of plasma half-life.</p> <p><b>3.</b> Understand the concept of drug clearance.</p>

		<ol style="list-style-type: none"> <li>4. Describe factors affecting drug clearance.</li> <li>5. Explain the Clinical Significance of different values of Drug Clearance.</li> <li>6. Explain steady state plasma concentration.</li> <li>7. Explain Clinical Significance of Steady State plasma concentration.</li> <li>8. Define &amp; Explain Elimination and Orders of Elimination – First &amp; Zero Order Kinetics with examples.</li> <li>9. Describe Clinical Significance of First &amp; Zero Order Kinetics.</li> <li>10. Tabulate differences between First order kinetics and Zero Order Kinetics.</li> <li>11. Define, explain &amp; calculate maintenance dose and loading dose using appropriate formula</li> </ol>
	Excretion	<ol style="list-style-type: none"> <li>1. Describe drug excretion.</li> <li>2. Enlist routes of drug excretion.</li> <li>3. Describe processes of drug excretion through the kidneys.</li> <li>4. Describe factors affecting glomerular filtration &amp; tubular reabsorption.</li> <li>5. Describe the Clinical Significance of Glomerular Filtration, Active Tubular Secretion and Passive</li> <li>6. Tubular Reabsorption of Drugs</li> </ol>

### GENERAL PATHOLOGY

Topic	Sub Topic	Learning objectives
Pathology	Genetics	<ol style="list-style-type: none"> <li>1. Define mutation and classify different types Describe the features and examples</li> </ol>

		<p>of the following</p> <ul style="list-style-type: none"> <li>• Autosomal dominant disorders</li> <li>• Autosomal recessive disorders</li> <li>• X-linked disorders</li> </ul> <p>2. Give brief account of steps of PCR and types of PCR</p>
	Genetic syndromes	<p>1. Give brief account of;</p> <ul style="list-style-type: none"> <li>• Marfan syndrome</li> <li>• Ehlers-Danlos syndrome</li> <li>• Down syndrome</li> <li>• Klinefelter syndrome</li> <li>• Turner syndrome</li> </ul> <p>2. Define karyotyping and enlist the karyotyping of above-mentioned syndromes</p>
Pharmacology	Comparison of Gram-positive and negative Bacterial cell wall structure, how bacteria differ from viruses	<p>1. To know the difference between gram positive and negative cell wall.</p> <p>2. How it affects the choice of antibiotic</p>

### MICROBIOLOGY

Topic	Sub Topic	Learning objectives
General Microbiology	Microbiology	<p>1. Classify gram-positive and negative cocci.</p> <p>2. Classify gram +ve and gram -ve rods.</p> <p>3. Classify spirochetes and atypical bacteria.</p> <p>4. Classify culture media and describe blood, chocolate, McConkey, nutrient, CLED, TCBS, TSI, citrate &amp; urease media. Blood culture. Seaboard agar.</p>

		<ol style="list-style-type: none"> <li>5. Define conjugation, transduction, and transformation and describe mechanisms of antimicrobial resistance.</li> <li>6. Define colonization resistance and enlist normal flora of skin, gut, respiratory tract, and vagina.</li> <li>7. Classify DNA viruses and RNA viruses. Classify medical mycoses fungi.</li> <li>8. Classify medically important parasites</li> </ol>
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### FORENSIC MEDICINE

Topic	Sub Topic	Learning objectives
Forensic Medicine & Jurisprudence	Introduction to the subject of Forensic Medicine	Describe Forensic Medicine & its various branches.
Jurisprudence	Chain of evidence	Describe evidence, its types & recording of evidence
	Introduction to Thanatology	Describe the importance of diagnosis of death
	Death certificate	Describe the WHO format of the death certificate.

### COMMUNITY MEDICINE)

Topic	Sub Topic	Learning objectives
Medicine	Concept & health disease	<ol style="list-style-type: none"> <li>1. Define Health.</li> <li>2. What are health dimensions?</li> <li>3. What are the good health indicators?</li> <li>4. Calculate and interpret health indicators of Public Health Importance.</li> </ol>

### PATIENT SAFETY

Topic	Sub Topic	Learning objectives
Clinical subjects	What is patient safety	Explain why patient safety is a critical concern in healthcare and how it impacts the quality of patient care.
	Applying human factors is important for patient safety	Students should understand the relationship between human factors and patient safety

### GENERAL SURGERY

Topic	Sub Topic	Learning objectives
Pathology	Wound Management	Describe the basics of Wound Healing & tissue repair
Gen surgery	Burns	Classify Burns & its management
Emergency medicine	Shock & hemorrhage	Identify hemorrhage & shock in Trauma patient.

### GENERAL MEDICINE

Topic	Sub Topic	Learning objectives
Medicine	Bacterial diseases	Signs, symptoms, and differentials of common bacterial diseases.
	Viral diseases	Signs, symptoms, and differentials of common viral diseases.

### PSYCHIATRY

Topic	Sub Topic	Learning objectives
Behavioral sciences	Introduction to Health Behavior and Its Determinants	<ol style="list-style-type: none"> <li>1. Define health behavior and discuss the importance of behavioral sciences in medical practice.</li> <li>2. Identify biological, psychological, and social factors that influence health behaviors and decision- making.</li> </ol>

		3. Discuss key behavioral change models (e.g., Health Belief Model, Theory of Planned Behavior) and their application in patient care.
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### 5.3.2 Practical / Lab Work

#### PHARMACOLOGY

Topic	Sub Topic	Learning objectives
Pharmacology	Calculation	Calculations of drug dosing (e.g., IV infusion) & dose of children.
	Drug dosing	Calculations (Mean, Mode, Median, Standard Deviation, and Standard Error), and Metrology.

#### GENERAL PATHOLOGY

Topic	Sub Topic	Learning objectives
Pathology	Use of Microscope & Gram staining	To perform steps of gram staining. How this staining will help to choose antibiotics

#### FORENSIC MEDICINE

Topic	Sub Topic	Learning objectives
Forensic Medicine	Trace evidence	Describe trace evidence & its types
	Dactylography	Types of fingerprints
	Recording of evidence	Recording of dying declaration

### 5.3.3 Clinical Rotations / Community Healthcare

#### GENERAL SURGERY

Topic	Sub Topic	Learning objectives
Surgical	Basic Surgical	Enlist Suture types & techniques

Emergency	Skills	
Integrate General Surgery	Wound Management	Classify Wound Dressings & its protocols

### GENERAL MEDICINE

Topic	Sub Topic	Learning objectives
Gen medicine	History taking	History taking skills
Gen medicine	General physical examination	Approach to patient





**GENERAL & CLINICAL**  
**PHARMACOLOGY**

## **6. General & Clinical Pharmacology**

### **6.1 Module Rationale**

The General & Clinical Pharmacology module consists of General Pharmacology and Autonomic Nervous System Pharmacology. It is designed to emphasize on various pharmacodynamics processes, drug interactions, and adverse drug reactions, all of which are integral in understanding how the drugs work and how they are used in clinical practice.

Additionally, it highlights the role of pharmacogenomics in drug responses and explores the phases of drug development, providing students with the basic knowledge necessary for safe, effective, and personalized pharmacological interventions in clinical practice.

The Autonomic Pharmacology module introduces third-year medical students to the pharmacological principles of the autonomic nervous system (ANS), which regulates essential involuntary functions such as heart rate, blood pressure, digestion, and respiratory function. The module covers both the cholinergic and adrenergic systems, providing a strong foundation for understanding how drugs interact with these systems to treat diseases/conditions. Given the wide-ranging clinical applications of autonomic drugs, this module plays a critical role in bridging basic pharmacology with clinical medicine, particularly in fields like cardiovascular, gastrointestinal, and respiratory medicine.



## 6.2 Module Outcomes

- Explain the fundamentals of pharmacodynamics and how drugs interact with biological systems and their mechanism of action. Describe dose-response relationships, drug efficacy, and potency.
- Recognize therapeutic windows and factors influencing drug response.
- Apply pharmacodynamics principles to predict drug effects and optimize therapy.
- Understand different types of drugs that act on the autonomic nervous system and their clinical usage. Explain the fundamentals of pharmacodynamics and how drugs interact with biological systems and their mechanism of action. Describe dose-response relationships, drug efficacy, and potency.
- Recognize therapeutic windows and factors influencing drug response.
- Apply pharmacodynamics principles to predict drug effects and optimize therapy.
- Understand different types of drugs that act on the autonomic nervous system and their clinical usage. Explain the fundamentals of pharmacodynamics and how drugs interact with biological systems and their mechanism of action. Describe dose-response relationships, drug efficacy, and potency.
- Recognize therapeutic windows and factors influencing drug response.
- Apply pharmacodynamics principles to predict drug effects and optimize therapy.
- Understand different types of drugs that act on the autonomic nervous system and their clinical usage.

## 4.6. Learning Objectives

### 6.3.1 Knowledge

#### PHARMACOLOGY

Topic	Sub Topic	Learning objectives
Pharmacology	Pharmacodynamics	Define Pharmacodynamics, Affinity, Efficacy, Potency
		Explain Agonists, partial agonists, inverse agonists, bias, allosteric agonists, and modulators with Examples.
		Define Spare receptors and give clinical importance.
		Elaborate Transmembrane signaling pathways
		Name the Effectors controlled by G-proteins
		Describe various Drug-antagonism types with examples
		Define Median Effective (ED50), Median Toxic (TD50) & Median Lethal Dose (LD50) and its clinical relevance
		Define the Therapeutic index and give its clinical importance.
		Define the Therapeutic window and give its clinical importance.
		Compare & discuss the information derived from Graded and Quantal dose-response curves
		Explain the significance of Semi-log Transformation.
		Define Desensitization, Tachyphylaxis, Tolerance, Resistance, Super sensitivity, Hypersensitivity, Superinfection, Iatrogenic effect, and Idiosyncrasy, and give examples.
Describe the Phenomenon of down- regulation		

		of receptors.
		Describe Pharmacogenetics and give examples Illustrate various phases of Drug development.
Biochemistry & Physiology		List the cholinergic receptors and recall their site of action and 2nd messenger system. Classify cholinergic agonists and antagonists.
Physiology		Discuss the pharmacological actions / systemic effects of cholinergic agonists and antagonists. Outline the clinical uses and adverse effects of Cholinomimetics.
Medicine		Differentiate between myasthenia crisis and cholinergic crisis. Give the outline of the management of Myasthenia gravis. Role of pharmacology in Alzheimer's disease.
Ophthalmology	Autonomic Pharmacology	Role of Pharmacology in treatment of Glaucoma
Medicine	Cholinergic System	Discuss the management of Organophosphate (OPC) poisoning Describe the process of "aging" in OPC poisoning and its management Discuss the Therapeutic Uses of Antimuscarinics Role of anticholinergic drugs in the management of Parkinson's disease Enlist the Toxicity and contraindications of Atropine along with their rationale. Enlist the Toxicity and Management of Nicotine Poisoning Enlist the Toxicity and Management of Mushroom Poisoning
Physiology and		Enlist the adrenergic receptors and recall their

Biochemistry		site of action and 2nd messenger system.
		Classify adrenergic agonists
Biochemistry		Classify adrenergic agonists
		Recall the general characteristics of catecholamine.
		Compare the structural characteristics of catecholamine & non-catecholamine
Physiology		Discuss the pharmacological actions / systemic effects of direct and indirect-acting adrenergic agonists.
		Enlist the therapeutic uses, adverse effects, and contraindications of direct-acting adrenergic agonists.
		Classify alpha blockers
		Elaborate the clinical uses of alpha-blockers.
		Discuss the adverse effects of alpha-blockers.
		Classify Beta-blockers
		Explain the clinical indications of beta antagonists
		Enlist their adverse effects.
		Compare and contrast the characteristics of Reserpine and Guanethidine.
		Explain the pharmacological actions of ganglion blockers.
		Discuss epinephrine reversal
		Expand on the pharmacology of drugs that balance sympathetic and parasympathetic activity.(like clonidine and methyldopa)
		Use of Artificial Intelligence (AI) in understanding and modulating the autonomic nervous system
		Use of AI to improve pharmacotherapy for conditions like hypertension and chronic heart
Medicine	Autonomic Pharmacology (Adrenergic System)	

	failure
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### **BIOCHEMISTRY**

Topic	Sub Topic	Learning objectives
Biochemistry	Signal Transduction & Second Messengers	<ol style="list-style-type: none"> <li>1. Describe the features of Signal transduction.</li> <li>2. Describe different types of second messengers</li> <li>3. Differentiate the G protein and non-G protein mediated</li> </ol>

### **PHYSIOLOGY**

Topic	Sub Topic	Learning objectives
Medical physiology	Autonomic Nervous System	<ol style="list-style-type: none"> <li>1. Describe the types of adrenergic and cholinergic receptors and their functions.</li> <li>2. Explain the effects of sympathetic and parasympathetic on various organs/systems of the body</li> </ol>

### **BEHAVIOURAL SCIENCES**

Topic	Sub Topic	Learning objectives
Behavioural sciences	Ethical dilemmas	Describe common ethical dilemmas in drug trials & pharmaceutical industry.

#### **6.3.2 Practical / Lab Work**

### **PHARMACOLOGY**

Topic	Sub Topic	Learning objectives
Pharmacology	Drug preparation and dispensing	Preparation on Normal Saline, dextrose Saline and 1000 ml of O.R.S. in water
		To prepare and dispense doses of carminative

		mixture
		To prepare and dispense 100 ml of 0.1 % KMnO <sub>4</sub> solution using a stock solution
		To prepare and dispense 4 doses of APC Powder
		To prepare and dispense 12 g of Sulphur ointment B-P 10%
	Autonomic Nervous System	Analysis and interpretation of Drugs (Acetylcholine, Atropine Adrenaline, Propranolol) on animal through online videos / simulations / graphs / practical performance.
		Analysis and interpretation of different Concentrations of Acetylcholine on Rabbit's Ileum through online videos / simulations / graphs / practical performance.
		Analysis and interpretation of drug Antagonism Between Acetylcholine and Atropine on Rabbit's Ileum through online videos / simulations / graphs / practical performance.
		Analysis and interpretation of Drugs (Pilocarpine, Adrenaline, Atropine, Homatropine, Proparacaine) on Rabbit's Eye through online videos / simulations / graphs / practical performance.

### PATIENT SAFETY

Topic	Sub Topic	Learning objectives
Pharmacology	Learning from errors to prevent harm	Understanding of the terms error, slip, lapse, mistake, violation, near miss and hindsight bias
	Medication safety	Learn and practice ways to improve the safety

		of medication use.
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# HEMATOPOIETIC, IMMUNITY & TRANSPLANT

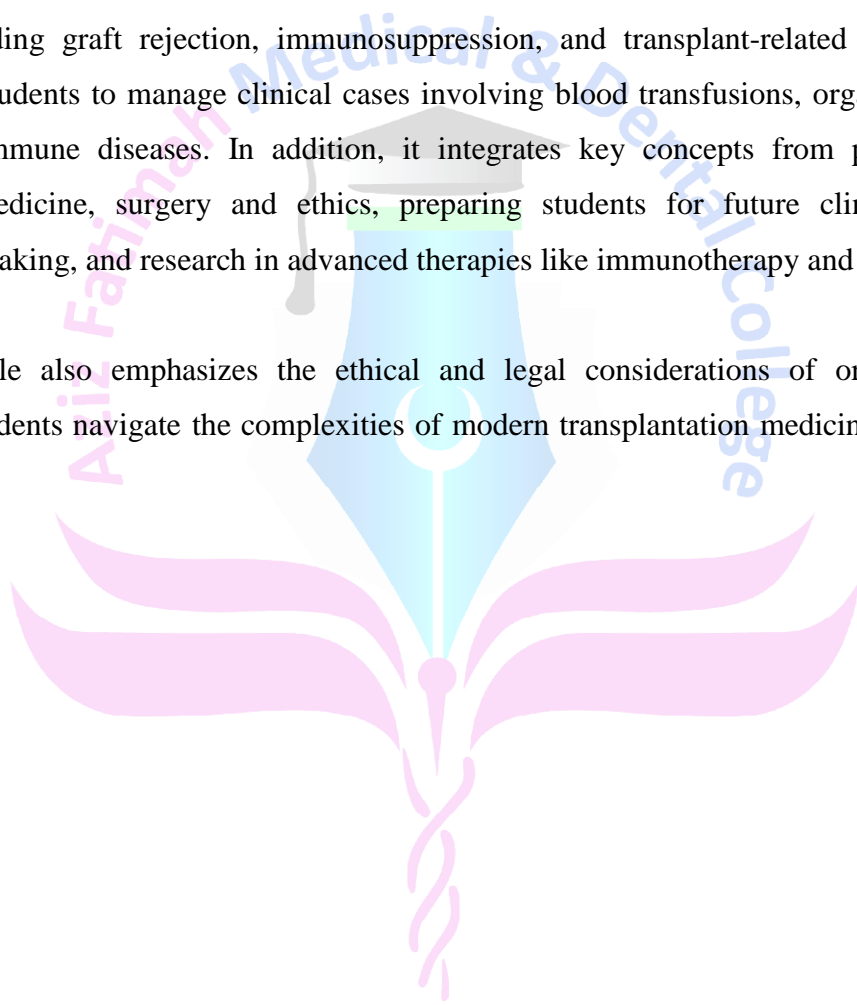
## **7. Hematopoietic, Immunity Transplant**

### **7.1 Module Rationale**

The study of hematopoietic immunity and transplantation is critical for 3rd-year MBBS students as it forms the foundation for understanding the pathological basis for immune function, blood disorders, and the life-saving field of organ and tissue transplantation. This module integrates immunology, hematology, and clinical medicine, providing students with essential knowledge, skills and behavior about hematopoietic stem cells, immune responses, and their role in diseases like leukemia, lymphoma, and immunodeficiencies.

Understanding graft rejection, immunosuppression, and transplant-related complications prepares students to manage clinical cases involving blood transfusions, organ transplants, and autoimmune diseases. In addition, it integrates key concepts from pharmacology, general medicine, surgery and ethics, preparing students for future clinical practice, decision-making, and research in advanced therapies like immunotherapy and bioengineered organs.

The module also emphasizes the ethical and legal considerations of organ donation, helping students navigate the complexities of modern transplantation medicine.



## 7.2 Module Outcomes

- Describe the process of hematopoiesis including sites of blood cell formation in embryonic and adult stages.
- Describe the differentiation of stem cells into various mature blood cell lines
- Classify the key factors and signaling pathways for haemopoietic stem cell development and maintenance.
- Describe the characteristics of various blood cell, including erythrocytes, leukocytes and platelets.
- Explain the various hematological disorders such as inherited and acquired anemias, acute and chronic leukemias, Hodgkin and Non Hodgkin lymphomas and coagulation disorders in terms of inheritance, etiology, classification, pathogenesis, clinical features, diagnosis and prognosis.
- Explain and interpret the data of inheritance, etiology, classification, pathogenesis, clinical features, diagnosis and prognosis of Primary & Secondary Polycythemia and other myeloproliferative neoplasms.
- Interpret the patient and laboratory/radiological data of various hematological disorders such as inherited and acquired anemias, acute and chronic leukemias, Bone Marrow Failure Syndromes, Hodgkin and Non-Hodgkin lymphomas and coagulation disorders in terms of inheritance, etiology, classification, pathogenesis, clinical features, diagnosis and prognosis.
- Classify and explain mechanisms which can cause neutropenia/agranulocytosis, eosinophilia, lymphocytosis, neutrophilia and basophilia
- Differentiation between infective and malignant causes of leukocytosis with special reference to infectious mononucleosis, acute and chronic non-specific lymphadenitis.
- Explain and interpret the data of multiple myeloma with respect to etiology, pathogenesis, morphology, clinical features and diagnosis.
- Explain and apply knowledge of different drugs used to treat anemias, polycythemias, coagulation disorders, myeloproliferative disorders and bone marrow failure syndromes.
- Explain ABO and Rhesus blood groups, their clinical importance and method of group typing.
- Explain and identify common indications of blood products (red cells, platelets and plasma) in different clinical scenarios.

- Explain and interpret the data regarding hazards of blood transfusion and apply methods of their prevention in different clinical scenarios.
- Describe concepts of immune system and different immunities as passive, active, innate and adaptive
- Compare and contrast the various immune cell
- Elaborate the primary (bone marrow and thymus) and secondary (Spleen, lymph nodes and MALT {mucosa associated lymphoid tissue}) lymphoid organs.
- Analyze the mechanisms of antigen recognition/presentation the related diseases.
- Describe the processes involved in antibody production and B cell role in humoral immunity.
- Describe the complement activation pathways and interpret the data regarding their role in immune response to infections, autoimmunity, transplant rejection and immune deficiency diseases.
- Explain and interpret the data regarding clinical aspects of hypersensitivity reactions (infectious diseases and autoimmune diseases).
- Describe the principles of organ and tissue transplantation including the various types as allograft, isograft etc.
- Identify the common organs/tissue transplanted such as kidneys, liver, cornea, lung etc.
- Understand the role of Human Leukocyte Antigen (HLA) system and tissue matching.
- Illustrate the pharmacological drugs used in immunosuppression along with their mechanism of action. Explain the different types of rejection as hyperacute, acute and chronic.
- Apply knowledge of haemopoietic, immune and transplant principles to clinical scenarios along with management of hematological disorders and transplant patients
- Explain recent advancements in haemopoietic stem cell research, immunotherapy and transplantation techniques.
- Describe the ethical considerations such as consent, national and international laws governing organ donation and transplantation.
- Identify the future challenges in field of transplantation such as bioengineered organs.

### 7.3 Learning Objectives

#### 7.3.1 Knowledge

#### HEMATOLOGY

Topic	Sub Topic	Learning objectives
Hematology	Hematopoietic system	Describe the stages in formation of red blood cells (RBCs), white blood cells (WBCs), platelets
		Correlate hematopoiesis with various hematopoietic growth factors along with normal bone marrow morphology
		Identify normal values of RBC, WBC, hemoglobin level, packed cell volume, MCH, MCV, MCHC and platelet count.
		Classify and interpret the anemias on basis of morphology and underlying pathogenesis of RBC production
		Describe and interpret data related to causes, clinical features, clinical presentation and diagnosis of hypochromic anemia, megaloblastic anemia, anemia of chronic disease, Hereditary Spherocytosis, aplastic anemia and hemolytic anemias
		Give biochemical explanation for megaloblastic anemia in subjects suffering from deficiency of vitamin B9 and B12.
		Give biochemical explanation for microcytic anemia in subjects suffering from deficiency of vitamin B6, vitamin B2, vitamin C, vitamin A, and iron.
		Elaborate the biochemical mechanism underlying hemolysis in subjects suffering from deficiency of pyruvate kinase and

		glucose-6-phosphate dehydrogenase.
		Elaborate the biochemical mechanism underlying hemolysis in subjects suffering from hereditary spherocytosis and elliptocytosis.
		Give biochemical explanation for hemolysis in subjects suffering from vitamin E deficiency.
		Describe the clinical manifestations, clinically differentiating features and clinical course of patient with anemia.
General Surgery		Recognize symptoms driving surgical decisions such as jaundice, pallor and fatigue that may require surgical intervention especially splenectomy
		Evaluate physical signs for surgical planning as splenectomy particularly in cases where splenic sequestration or hypertension exacerbates hemolysis
		Monitor patient's post-splenectomy for recurrent symptoms like jaundice or anemia, which may suggest incomplete resolution or complications requiring surgical or medical management
Hematology		Describe and interpret data related to etiology, pathogenesis, clinical types, and diagnosis of thalassemia with emphasis on incidence, common mutations, associated psychosocial problems and prevention
Biochemistry		Clearly differentiate between quantitative and qualitative hemoglobinopathies
		Elaborate the genetic basis and inheritance of important types of quantitative hemoglobinopathies (alpha and beta

		thalassemia's).
		Elaborate the genetic basis and inheritance of important types of qualitative hemoglobinopathies (HbS, HbC, HbSC).
		Enlist the inherited and acquired causes of methemoglobinemia's and elaborate the consequences.
Hematology		Describe and interpret the data inheritance, clinical features, lab diagnosis of Von Willebrand's disease, Hemophilia A&B and Polycythemia
Biochemistry		Give explanation for hemorrhages in subjects suffering from vitamin K and vitamin C deficiency.
Hematology		Elaborate mechanisms which can cause neutropenia/agranulocytosis
Biochemistry		Explain how deficiency of glucose-6-phosphate translocase results in neutropenia and recurrent infections.
Hematology	Lymphoid system	Differentiate between infective and malignant causes of leukocytosis with special reference to infectious mononucleosis, acute and chronic non-specific lymphadenitis
		Explain and interpret the data of non-Hodgkin's lymphoma in terms of classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis.
		Explain and interpret the data of Hodgkin's lymphoma in terms of classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis.
General Surgery		Explain the pathophysiology of gastric lymphomas including the type (e.g. MALT

		and diffuse large B-cell lymphoma), role of H. pylori infection
		Identify the clinical features and diagnostic modalities (e.g., Endoscopy, biopsy, and imaging) and differential diagnosis of gastric lymphomas inpatients presenting with gastrointestinal symptoms
Hematology		Explain and interpret the data of acute and chronic leukemias with respect to classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis
General Medicine		Describe the clinical manifestations, clinically differentiating features and clinical course of patient with leukemia.
		Explain and interpret the data of multiple myeloma with respect to etiology, pathogenesis, morphology, clinical features, diagnosis, staging and prognosis
Hematology	Haemopoietic system	Explain and interpret the data of disseminated intravascular coagulation with respect to classification, etiology, pathogenesis, morphology, clinical features, diagnosis, prognosis, and management.
Pharmacology		Classify anticlotting drugs: Compare their usefulness in venous and arterial thromboses Describe the mechanisms of action, clinical uses, and adverse effects of anticoagulants Compare Unfractionated heparin, LMW heparins and oral anticoagulants
		Compare and contrast the mechanism of action, clinical uses, and toxicities of the oral anticoagulants (warfarin, rivaroxaban, and dabigatran).

		Explain the pharmacokinetic and pharmacodynamics drug interactions of Warfarin
		Describe the mechanisms of action, clinical uses, and adverse effects of antiplatelet drugs Illustrate where the 4 major classes of antiplatelet drugs act Differentiate between Clopidogrel and Ticlopidine
		Discuss the mechanism of action, clinical uses, adverse effects, and contraindications of Thrombolytics Tabulate differences between Streptokinase & recombinant tissue plasminogen activators.
		Enumerate hematopoietic growth factors, explain their mechanism of action, uses and adverse effects.
Hematology		Explain and interpret the data with respect to causes of decreased production and decreased survival of platelets in terms of classification, etiology pathogenesis, morphology, clinical features, diagnosis, prognosis, and management.
General Medicine		Interpretation of coagulation profile in the assessment of bleeding disorders Describe the clinical manifestations, clinically differentiating features of patients with bleeding tendency.
Pharmacology		List the drugs used to treat bleeding disorders
Hematology	Blood Transfusion	Understand the ABO and Rhesus blood groups their clinical importance and method of group typing Explain and identify common indications of

		blood products (red cells, platelets, and plasma) and hazards of blood transfusion and methods of their prevention in different clinical scenarios
Biochemistry		Enlist changes that take place in the biochemical composition of stored blood. Give significance of rejuvenation.

### GENERAL PATHOLOGY

Topic	Sub Topic	Learning objectives
General Pathology	Immunology	Describe clinical aspects of innate and acquired immunity, active and passive immunity
		Classify the types of cells taking part in immune response (Phagocytes, T cells, B cells & NK cells) and apply data in their clinical importance
		Correlate complement activation pathways with their role in immune response to infections, autoimmunity, transplant rejection and immune deficiency disease
		Elaborate MHC and their role in clinical diseases
Pharmacology	Hematopoietic system	Classify immunosuppressants and antibodies with their mechanism of action, clinical uses, and toxicities
		Identify the major cytokines and other immunomodulating agents and know their clinical applications.
General	Immunology	Understand the clinical aspects of

Pathology		hypersensitivity reactions and interpret the data related to these conditions (infectious diseases and autoimmune disease)
General Pathology	Immunology	Describe types of transplant rejection & Graft vs Host disease and apply the knowledge in different clinical scenarios
Pharmacology	Transplantation	Role of pharmacology in organ transplant
		Overview of prophylactic treatments of Post-Transplant Infections, such as antiviral drugs (e.g., valganciclovir for CMV) and antifungal medications
General Pathology		Describe clinical aspects of auto immunity and autoimmune disease and apply the knowledge in different clinical settings.

### 7.3.2 Practical / Lab Work

#### GENERAL PATHOLOGY

Topic	Sub Topic	Learning objectives
Hematology	Hematopoietic and Lymphoid System	Perform CBC on analyzer and interpret the report.
	Hematopoietic System	Analyze RBC indices, Platelet Indices and WBC parameters.
		Perform PT, APTT and Bleeding Time. Interpret the reports
		Perform Blood Group and Cross Match, interpret the reports.
		Identify normal blood cells.
		Identify common malignant disorders e.g., CML, CLL Acute Leukemias.
Immunology	Immunology	Interpret the data of ELISA for different tests related to immunology.
	Transplant	Interpret the data of Graft rejection, Graft

		versus host disease.
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### 7.3.3 Clinical Rotations / Community Healthcare

#### GENERAL PATHOLOGY

Topic	Sub Topic	Learning objectives
Hematology	Blood Transfusion	Administer Blood Products x3
		Clinical Audit for indications and transfusion reactions x3





**FORENSIC MEDICINE &**  
**TOXICOLOGY-I**

## **8. Forensic Medicine & Toxicology-I**

### **8.1 Module Rationale**

The Forensic Medicine and Toxicology Module 1 prepares the medical graduate to handle the complexities of life and death and the medico-legal cases they encounter in their early career as doctors. The Autopsy training provides them with diagnostic skills for determining the cause of death, personal identity is essential for disaster victim identification, and medico-legal cases involving unidentified bodies. The death indicators and certification of death are important in their clinical practice. Introducing these topics in the 3rd year builds a strong foundation for handling medico-legal cases; ensuring students are ready to navigate the complexities of death-related issues in their future careers.



## 8.2 Module Outcomes

- Explain the concept of death and its medico-legal aspect
- Discuss the indicators of death
- Describe the inter-relationship of cause, mechanism, mode, and manner of death
- Determine the parameters of personal identification in living and dead
- Describe the types, objectives, rules, and techniques of autopsy
- Discuss the post-mortem artifacts and their medic-legal significance
- Discuss the methodologies and techniques employed for personal identification.
- Describe the methods of age certification



### 8.3 Learning Objectives

#### 8.3.1 Knowledge

#### THANATOLOGY

Topic	Sub Topic	Learning objectives
Integration with Medicine	Death and life	Define life and death.
		Describe views about death of different authorities.
		Differentiate between somatic and molecular death.
		Diagnose a case of death clinically.
		Describe the legal procedure of disposal of a dead body-known /unclaimed
		Describe brain death.
		Explain criteria of diagnosis of brain death
		Enlist guiding principles to diagnose a case of brain death
		Describe the medico legal importance of brain stem death.
		Summarize ethical, legal and moral considerations related with organ transplant and brain death
		Differentiate between Death and Apparent/Suspended Animation
		Describe different clinical conditions simulating with suspended animation
Forensic Medicine, Pathology & Chemical Pathology	Post-mortem changes - (Immediate early and late)	Classify post-mortem changes.
		Classify post-mortem changes.
		Describe immediate signs of somatic death
		Explain early eye changes after death
		Explain Post-mortem Cooling of Dead body (Algor Mortis) and its medicolegal implications.

		Describe methods of recording the temperature of a dead body.
		Explain cooling curve of a dead body.
		State different formulas applied for calculating body temperature after death.
		Summarize factors affecting Algor Mortis
		Explain Postmortem Lividity and its mechanism of development.
		Explain its Medicolegal implications.
		Summarize factors affecting post-mortem lividity.
		Differentiate Postmortem Lividity from Congestion and Bruise
		Explain Rigor Mortis and its mechanism of development.
		Describe its Medicolegal implications.
		Summarize factors affecting Rigor Mortis
		Summarize conditions simulating Rigor Mortis
		Distinguish Rigor Mortis from Cadaveric Spasm and instantaneous rigor
		Enlist late changes after death
		Explain the process of putrefaction.
		Describe different stages of putrefaction.
		Summarize factors affecting putrefaction
		Describe forensic entomology and its role in the estimation of post mortem interval
		Summarize the procedure to collect specimens of forensic entomology
		Draw and label graphic representation of post-mortem changes.
		Infer the importance of putrefaction in toxicological analysis

		Describe the process of Mummification
		Describe the process of adipocere formation
Biochemistry	Bio chemical changes, after death.	Summarize the biochemical changes in blood, vitreous humour and CSF after death
	Estimation of Post-mortem interval	List of different parameters to determine PMI
Forensic Medicine	Post-mortem interval	Describe rate method and concurrent methods to estimate PMI.
Medicine	Sudden death	Define sudden death
	Mechanism, manner, cause, modes of death,	Summarize common causes of sudden death
		Differentiate between modes, manner cause and mechanism of death.
Forensic medicine	Post-mortem artefacts	Define and classify post mortem artefacts
		Explain medico legal significance of artefacts.
	Flow- cytometry	Discuss the use of flow-cytometry in forensic medicine.
Medicine	Sudden infant death syndrome (SIDS)	Define sudden infant death syndrome
		Explain causes of sudden infant death syndrome and its pathological findings

### SPECIAL TRAUMATOLOGY

Topic	Sub Topic	Learning objectives
Pathology	Pathophysiology y of injuries	Describe the pathophysiology of injuries. Explain effects of injuries on the body.
Pathology, surgery, medicine & Forensic medicine	Timing of injury / ante mortem, post mortem nature of wound	<ol style="list-style-type: none"> <li>1. Elaborate different methods (naked eye examination, microscopic examination, histochemical and biochemical methods) for determination of age of wound.</li> <li>2. Describe different methods (naked eye examination, microscopic examination,</li> </ol>

		histochemical and biochemical methods of determination of ante mortem/ post mortem nature (vital reaction) of a wound.
	Ewing's postulates	Link Sequelae of trauma to its original cause and search for the relationship of sequelae to pre-existing disease.
	Battered baby syndrome	<ol style="list-style-type: none"> <li>1. Give a detailed account of battered baby or Caffey syndrome from a medico legal point of view.</li> <li>2. Diagnose a case of a battered baby on the basis of different injuries sustained by a battered baby</li> </ol>
	Torture	<ol style="list-style-type: none"> <li>1. Define torture.</li> <li>2. Explain reasons, types, and complications of torture. Describe medico legal aspects of torture.</li> </ol>
	Medico legal Certification of injury	Examine and prepare Medico-legal report of an injured person with different etiologies in a Simulated/supervised environment.
	Internal ballistics	<ol style="list-style-type: none"> <li>1. Define fire arms and ballistics. Classify fire arm.</li> <li>2. Explain different parts of fire arm weapons. Describe ammunition used in firearms.</li> <li>3. Explain chain of events of firing</li> </ol>
	External Ballistics	To explain the factors affecting the trajectory of bullet after its exit from the muzzle end.
	Terminal Ballistics	<ol style="list-style-type: none"> <li>1. Interpret wound complex produced by a rifled and non- rifled weapons at different ranges.</li> <li>2. Calculate the distance of fire from the wound examination.</li> <li>3. Differentiate between entry and exit</li> </ol>

		wounds of fire arms. 4. Explain medico legal importance of fire arm injuries.
	Gun powders	Identify gun powders and ammunition used through different methods.
	Blast injuries	1. Describe mechanics of blast injuries. 2. Explain effects of blast injuries on human body. Describe medico legal aspects of blast injuries
	Regional Injuries	1. Explain mechanism of injuries to soft and bony tissues of head, neck, chest, abdomen, and limbs. 2. Describe effects of injuries to head, neck, chest, abdomen, and limbs. 3. Describe medico legal aspects of regional injuries
	Transportation Injuries	1. Classify transport accidents. 2. Describe different factors involved in the causation of RTA. 3. Classify and describe different patterns of injuries sustained by pedestrians and occupants of the vehicles 4. Explain medico legal significance and prevention of RTA.
Surgery	Thermal Injuries / Burn	1. Define thermal injuries. 2. Classify thermal injuries-flame burns and scalds. Describe degree of burns according to different classifications. 3. Calculate percentage of burnt surface area and their effects on the body. 4. Describe management of the burnt patient clinically. Appraise causes of death due to burn.

		<ol style="list-style-type: none"> <li>5. Determine age of burn and ante-mortem/post mortem nature of burn.</li> <li>6. Describe autopsy findings and medico legal importance of burns.</li> </ol>
	<p>Electrocution Lightening</p>	<ol style="list-style-type: none"> <li>1. Classify electrical injuries injuries-low voltage and high voltage</li> <li>2. Explain factors affecting electrocution.</li> <li>3. Describe mechanism and causes of death in electrocution.</li> <li>4. Interpret different patterns of electrical injuries due to low and high voltage current and lightening</li> <li>5. Describe autopsy findings and medico legal importance of electrocution</li> </ol>
	<p>Hyper / Hypothermia/ Starvation</p>	<ol style="list-style-type: none"> <li>1. Explain deaths from exposure to high environmental temperature like heat stroke, heat cramps and heat exhaustion.</li> <li>2. Explain deaths from exposure to low environmental temperature like Frost bite, Trench foot, Immersion foot.</li> <li>3. Describe their mechanism of development, autopsy findings and medico legal importance.</li> <li>4. Interpret Starvation, causes, clinical findings, autopsy findings and medico legal importance</li> </ol>
	<p>Chemical Burns</p>	<ol style="list-style-type: none"> <li>1. Describe chemical burns</li> <li>2. Explain mechanism of development of chemical burns Describe autopsy findings</li> </ol>
	<p>Thermal Injuries / Burn</p>	<ol style="list-style-type: none"> <li>1. Define thermal injuries.</li> <li>2. Classify thermal injuries-flame burns and scalds. Describe degree of burns according to different classifications.</li> </ol>

		<ol style="list-style-type: none"> <li>3. Calculate percentage of burnt surface area and their effects on the body.</li> <li>4. Describe management of the burnt patient clinically. Appraise causes of death due to burn.</li> <li>5. Determine age of burn and ante-mortem/post mortem nature of burn.</li> <li>6. Describe autopsy findings and medico legal importance of burns.</li> </ol>
	Electrocution Lightening	<ol style="list-style-type: none"> <li>1. Classify electrical injuries injuries-low voltage and high voltage</li> <li>2. Explain factors affecting electrocution.</li> <li>3. Describe mechanism and causes of death in electrocution.</li> <li>4. Interpret different patterns of electrical injuries due to low and high voltage current and lightening</li> <li>5. Describe autopsy findings and medico legal importance of electrocution</li> </ol>
	Hyper / Hypothermia/ Starvation	<ol style="list-style-type: none"> <li>1. Explain deaths from exposure to high environmental temperature like heat stroke, heat cramps and heat exhaustion.</li> <li>2. Explain deaths from exposure to low environmental temperature like Frost bite, Trench foot, Immersion foot.</li> <li>3. Describe their mechanism of development, autopsy findings and medico legal importance.</li> <li>4. Interpret Starvation, causes, clinical findings, autopsy findings and medico legal importance</li> </ol>
	Chemical Burns	<ol style="list-style-type: none"> <li>1. Describe chemical burns</li> <li>2. Explain mechanism of development of</li> </ol>

		<p>chemical burns Describe autopsy findings</p> <p>Summarize the chemical buns as per qisas and diyat act.</p> <p>3. Describe medicolegal importance of chemical burns.</p>
	Drowning	<p>1. Define and classify drowning.</p> <p>2. Explain mechanism of death in wet and dry drowning. Describe external and internal autopsy findings in wet and dry drowning.</p> <p>3. Interpret biochemical and diatom tests.</p> <p>4. Emphasize medicolegal importance of drowning</p>

### MEDICOLEGAL ASPECTS OF SEXUAL OFFENCES

Topic	Sub Topic	Learning objectives
Forensic Medicine & Gyne/obs	Impotency frigidity and sterility	<p>1. Comprehend the terms-impotency, frigidity in females and sterility</p> <p>2. Explain their causes.</p> <p>3. Narrate their medico legal importance</p>
	Virginity and defloration	<p>1. Explain signs of virginity and defloration.</p> <p>2. Interpret medico legal importance</p>
	Pregnancy	Describe presumptive, probable, and sure signs of pregnancy in living and dead.
	Delivery	Explain recent and old signs of delivery in living and dead.
	Abortion/Miscarriage	<p>1. Define and classify abortions</p> <p>2. Explain motives for criminal abortions</p> <p>3. Reproduce different methods of inducing criminal abortion</p> <p>4. Outline complications and causes of death due to abortion.</p>

		<p>5. Describe findings in living and dead after abortion. Examine the aborted material to assess the age and viability Apply sections of Qisas and Diyat act relevant to abortion.</p>
	Sexual Offences	<ol style="list-style-type: none"> <li>1. Classify sexual offenses (natural, unnatural and perversions) and explain their medico legal importance.</li> <li>2. Describe sexual perversions and identify the traits. Reproduce different sections of law relevant to sexual offenses.</li> <li>3. Explain Medico-legal examination of a victim of sexual assault and issue report.</li> <li>4. Describe Medico-legal examination of the alleged accused of rape and</li> <li>5. issue report</li> <li>6. Know the Medico-legal examination in unnatural sexual offence.</li> <li>7. Outline collection, preservation, and dispatch of specimens in cases of sexual assaults to chemical examiner.</li> <li>8. Interpret Psycho-pathology of assailant Interpret Psycho-pathology of victim</li> <li>9. Undertake initial management &amp; referral of victim</li> </ol>
Forensic Medicine	Infanticide	<ol style="list-style-type: none"> <li>1. Define infanticide.</li> <li>2. State status of infants-still born/dead born/live born. Describe autopsy findings to determine whether live</li> <li>3. born or not, cause of death, age of new born and others</li> </ol>

8.3.2 Practical / Lab WorkTRAUMATOLOGY

Topic	Sub Topic	Learning objectives
Forensic medicine	Mechanical injuries	Recognize and identify common conventional blunt objects, sharp objects, firearms, electrical instruments and chemicals and their medico- legal aspects. (lathi, knife, axe, gandasa, sickle, dagger, razor & stick, fire arms
	Abrasion	Differentiate between different types of abrasions
	Bruise	<ol style="list-style-type: none"> <li>1. Assess the age of a bruise on the basis of color changes.</li> <li>2. Differentiate between a bruise and post mortem staining</li> </ol>
	wound	Differentiate between a lacerated and incised wound on naked eye examination
	Age of fracture	<ol style="list-style-type: none"> <li>1. Assess the age of fracture by recognition of healing stages on x rays</li> <li>2. Apply different sections of Qisas and Diyat Act from examination of fractures on x rays</li> </ol>
	Hurt / Qisas N Diyat Act	Identify hurt and apply relevant section of Qisas and Diyat Act for: <ol style="list-style-type: none"> <li>1. Itlaf-udw</li> <li>2. Itlaf -slahiat-udw</li> <li>3. Shajja</li> <li>4. Jurh</li> </ol>
	Certification of injury	Demonstrate appropriate examination of an injured person and issue the report in a simulated/supervised environment correctly
	Firearm	<ol style="list-style-type: none"> <li>1. Identify different types of fire arm</li> </ol>

		<p>weapons</p> <p>2. Identify different parts of fire arm weapons Identify different parts of ammunition.</p>
		<p>1. Determine the type of fire arm weapon from the examination of fire arm wound complex.</p> <p>2. Calculate the firing range of the weapon from appearance of wound.</p> <p>3. Identify characteristics of entry and exit fire arm wounds.</p>
	Burn	<p>1. Differentiate between dry burn and wet burn. Calculate burnt surface area</p> <p>2. Determine age and nature of burn on naked eye Examination</p> <p>3. Recognize autopsy findings</p>
	Electrocuted injury	<p>1. Recognize between entry and exit wounds of electric currents on body.</p> <p>2. Describe different pathways of electric currents through human body.</p> <p>3. Recognize different patterns of electrical injuries.</p>
	Hypo / Hypothermia / starvation	<p>1. Recognize different patterns of effects of high/low environmental temperature on the body.</p> <p>2. Appreciate clinical and autopsy findings of death due to starvation</p>
	Chemical Burns	<p>1. Recognize different patterns of Chemical burns over body.</p> <p>2. Apply relevant sections of Qisas and Diyat Act.</p>
	Hanging	<p>1. Identify different kinds of ligature materials used for hanging</p> <p>2. Recognize different types of hanging</p>

		<ol style="list-style-type: none"> <li>3. Appreciate nonspecific and specific autopsy findings of hanging.</li> <li>4. Know how to remove and preserve the ligature material used.</li> </ol>
	Strangulation / Hanging	<ol style="list-style-type: none"> <li>1. Differentiate between ligature marks due to hanging and strangulation.</li> <li>2. Appreciate nonspecific and specific autopsy findings of hanging.</li> <li>3. Know how to remove and preserve the ligature material used.</li> </ol>
	Throttling	<ol style="list-style-type: none"> <li>1. Appreciate external and internal autopsy findings of death due to throttling.</li> <li>2. Determine the position of assailant and victim from external marks on neck</li> </ol>
	Smothering / Gagging	Appreciate external and internal autopsy findings of death due to smothering, choking, gagging and traumatic asphyxia
	Drowning	Appreciate external and internal autopsy findings of death due to drowning.

### SEXOLOGY

Topic	Sub Topic	Learning objectives
Forensic medicine	Sexual assault	<ol style="list-style-type: none"> <li>1. Replicate Medico-legal examination of a victim of sexual assault and issue report.</li> <li>2. Demonstrate Medico-legal examination of the alleged accused of rape and issue report.</li> <li>3. Copy the Medico-legal examination in unnatural sexual offence.</li> <li>4. Perform collection, preservation, and dispatch of specimens in cases of sexual assaults to chemical examiner.</li> </ol>

### 9. CFRC for Block-7

Code	Subject	Task/Skill
CFRC3-001	Pharmacology	Prescribing antihypertensives
CFRC3-002	Pharmacology	Prescribing antibiotics for infection
CFRC3-003	Pharmacology	Monitoring for drug side effects
CFRC3-004	Pharmacology	Adjusting medications based on response
CFRC3-005	Pharmacology	Knowledge of common drug classes relevant to foundational clinical care (e.g., antibiotics, analgesics, antihypertensives).
CFRC3-006	Pharmacology	Ability to calculate and adjust dosages for common medications based on patient factors.
CFRC3-007	Community Medicine	Perform proper hand hygiene, aseptic techniques, and basic infection control protocols.
CFRC3-008	Anesthesia	Demonstrate appropriate use of PPE and understand its importance in preventing healthcare-associated infections.
CFRC3-009	Medicine	Take detailed patient history and perform general physical exams.
CFRC3-010	Medicine	Understand fluid compartments and the basics of electrolyte balance.
CFRC3-011	Community Medicine	Offer guidance on health maintenance, such as hygiene, nutrition, and medication adherence.
CFRC3-012	Medicine	Perform and interpret measurements of vital signs (e.g., BP, pulse, temperature, respiratory rate).
CFRC3-054	Psychiatry	Effective communication during consultations (shared decision-making)
CFRC3-055	Psychiatry	Ethical considerations (confidentiality, informed consent)
CFRC3-058	Anesthesia	Able to scrub in for major and minor surgical procedures
CFRC3-059	Anesthesia	Assist in minor surgical procedures (observed in OT)
CFRC3-061	Medicine	General physical examination(medicine)

CFRC3-023	Surgery	Wound management and suturing
CFRC3-024	Surgery	History of infections related to surgical wounds
CFRC3-026	Surgery	Inspecting and diagnosing surgical wound infections
CFRC3-027	Surgery	Antimicrobial prophylaxis and post-surgical infection management
CFRC3-013	Medicine	Recognize abnormal vital signs and escalate care accordingly.
CFRC3-014	Surgery	Perform basic blood sampling (e.g., venipuncture) with proper aseptic technique.



### 10. PERL's for Block-7

FOUNDATION-II & EBM			
Topic	Sub Topic	Learning objectives	Proposed Portfolio Entry
<b>Professionalism</b>	Professional Responsibility in Clinical Rotations	<ol style="list-style-type: none"> <li>1. Understand the basic professional behaviors expected in clinical rotations, such as punctuality, appropriate communication, and respectful interactions with patients and staff.</li> <li>2. Observe a clinical setting and identify key professional behaviors demonstrated by healthcare staff, such as maintaining punctuality and professional communication</li> </ol>	A brief reflection on the key professional behaviors observed during the first clinical rotation session, noting how these behaviors contribute to patient care and professional conduct.
<b>Research</b>	Evidence-Based Practice for Disease Management	<ol style="list-style-type: none"> <li>1. Understand the principles of evidence-based practice (EBP) and how to apply current research findings to clinical decision-making for disease management.</li> <li>2. Apply evidence-based guidelines to develop a disease management plan.</li> </ol>	Create a case report detailing the application of EBP to a specific disease management scenario, including references to the literature
<b>Research</b>	Investigating medical errors	<ol style="list-style-type: none"> <li>1. Describe the process of investigating medical</li> </ol>	Poster Submission of a medical error case,

		<p>errors, including Root Cause Analysis (RCA) and the Swiss Cheese Model, to identify contributing factors and prevent future errors.</p> <p>2. Analyze a medical error case, conduct a root cause analysis, apply the Swiss Cheese Model and propose preventive measures to strengthen system defenses.</p>	<p>including both root cause analysis and a Swiss Cheese Model diagram that illustrates the alignment of system failures – along with proposed recommendations.</p>
<b>Ethics</b>	Reporting medical errors	<p>1. Discuss the ethical obligations in reporting medical errors and the role of transparency in maintaining patient trust and improving care quality.</p> <p>2. Draft an incident report on a simulated medical error, outlining the ethical considerations and steps taken to address the issue</p>	<p>Submit a written incident report on a simulated or real medical error, including the ethical implications and actions taken.</p>
<b>Leadership</b>	Role Modelling/ Mentoring Session V	<p>Participate in a mentoring session where they will discuss their strengths and weaknesses with their mentor, receive feedback, and collaboratively create an action plan for personal and professional development.</p>	<p>Mentoring Session V Key decisions</p>

		Discuss any challenges faced while carrying out any action plan if already created and related solutions to overcome those challenges.	
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GENERAL & CLINICAL PHARMACOLOGY			
Topic	Sub Topic	Learning objectives	Proposed Portfolio Entry
<b>Professionalism</b>	Responsible use of social media Platforms	<ol style="list-style-type: none"> <li>1. Discuss the principles of responsible use of social media platforms, including safeguarding patient confidentiality, conducting ethical interactions, and practicing careful online sharing.</li> <li>2. Discuss available social media use guidelines in healthcare.</li> </ol>	Develop and submit personal social media guidelines that reflect ethical use in professional and medical contexts
<b>Ethics</b>	Conflict of interest, Dealing with Pharmaceuticals	Explain the ethical challenges related to conflicts of interest in healthcare, particularly when dealing with pharmaceutical companies, and understand how to manage these situations maintain professional integrity. Analyze a case study where a conflict of	Submit an analysis of a case involving a conflict of interest in pharmaceutical dealings, including recommendations for handling the situation ethically and how such conflicts can be avoided in future practice.

		interest occurred involving pharmaceutical companies, and propose strategies for ethically managing such situations	
<b>Research</b>	Gaps in Literature	<ol style="list-style-type: none"> <li>1. Analyze existing research in a specific medical field to identify gaps in literature that need further exploration.</li> <li>2. Appreciate the importance of recognizing these gaps to formulate meaningful research problems.</li> <li>3. Identify and submit at least one significant gap in the literature, and propose a research question or hypothesis to address this gap.</li> </ol>	Submit a literature review summary identifying key gaps in the research.
<b>Leader</b>	Artificial Intelligence in Research	<ol style="list-style-type: none"> <li>1. Explore the role of artificial intelligence (AI) in medical research, including its applications, potential benefits, and challenges, while identifying ways AI can innovate and enhance research methodologies.</li> <li>2. Discuss the ethical implications of using AI</li> </ol>	Develop and submit a code of conduct for the responsible use of AI tools in research, focusing on ethical issues such as bias, data privacy, informed consent, and transparency.

		<p>in research, including bias, data privacy, transparency, and accountability concerns.</p> <p>3. Demonstrate the use of AI tools as supplementary tools in research.</p>	
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### HEMATOPOETIC, IMMUNITY & TRANSPLANT

Topic	Sub Topic	Learning objectives	Proposed Portfolio Entry
Professionalism	Maintaining Patient Confidentiality	<ol style="list-style-type: none"> <li>1. Discuss the principles for maintaining patient confidentiality.</li> <li>2. Appreciate the Importance of maintaining patient confidentiality in clinical practice.</li> <li>3. Discus legal and ethical implications of patient confidentiality.</li> </ol>	Reflective entry on a clinical case where confidentiality was maintained, detailing the challenges and how they were addressed.

### FORENSIC MEDICINE & TOXICOLOGY

Topic	Sub Topic	Learning objectives	Proposed Portfolio Entry
Ethics	Human Rights & Malpractice	Discuss ethical principles surrounding human rights in healthcare, particularly in malpractice cases, and recognize the professional	Case analysis of a malpractice incident, discussing the implications of human rights and detailing

		obligations to uphold patients' rights while preventing and addressing malpractice.	measures that could have been implemented to avoid the violation of patient rights.
Research	Legal and Ethical Aspects of Research	<ol style="list-style-type: none"> <li>1. Discuss the legal and ethical frameworks governing medical research, including protecting human subjects, informed consent, privacy, and compliance with national and international regulations.</li> <li>2. Discuss the role of Institutional Review Boards in the research process.</li> </ol>	Review and submit the Patient Information Sheet/ Informed Consent Sheet of your College IRB and propose any improvement if needed.
Leadership	Project Management	<ol style="list-style-type: none"> <li>1. Introduce the basic concepts of project management in healthcare, including planning, organizing, and executing small projects, such as case studies or group assignments.</li> <li>2. Participate in a class activity, where they will plan and organize tasks, set timelines, and assign roles to ensure the project is completed efficiently.</li> </ol>	Write a Class activity report with assigned roles taken by each group member. Critically evaluate the challenges observed with proposed recommendations.

## **11. Teaching & Learning Methodologies**

### ➤ **Interactive Lectures**

Interactive lecturing involves an increased interchange between teachers, students, and the lecture content. The use of interactive lectures can promote active learning, heighten attention and motivation, give feedback to the teacher and the student, and increase satisfaction for both.

### ➤ **Small group discussions**

Small-group discussion is a student-centered methodology that allows students to actively involve and be partners in the teaching-learning process. Students interact with peers and instructors, discussing, and sharing ideas. They develop the ability to build consensus in a group.

### ➤ **Practical's**

Hands-on performance of skills in laboratory

### ➤ **Clinical Ward Rotation**

During clinical rotations, students learn history taking and physical examination, recognize common clinical presentations, and get introduced to basic diagnostic procedures and treatment planning. They also develop professional behavior and communication skills essential for patient care.

### ➤ **Case based Learning**

Case-based learning is a student-centered learning approach where students read and discuss complex situations and apply their knowledge to each situation. Students typically examine the case together as a team and address the problems within the realistic scenario to develop a reasonable conclusion.

### ➤ **Self-directed learning**

Self-directed learning is an instructional strategy where the students with guidance from the teacher decide what and how they will learn. It can be done individually or with group, learning, but the overall concept is that students take honor ship of their learning

## **12. Assessment Methodologies**

### **Theory**

#### **1. MCQ's**

A multiple-choice question (MCQ) is composed of two parts: a stem that identifies the question or problem, and a set of alternatives or possible answers that contain a key that is the best answer to the question, and several distractors that are plausible but incorrect answers to the question.

#### **2. SEQ's**

It is a type of assessment tool in which a question on a topic is given in test or examination requiring a written analysis and explanation usually of a specified length.

### **Practical**

#### **1. OSPE**

“Objectively Structured Practical Examination.”, as a tool for the assessment of practical skills of undergraduate Medical Students.

#### **2. OSCE**

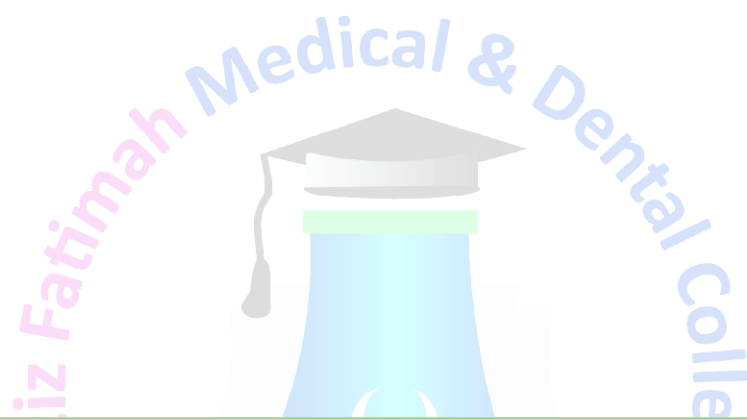
OSCE stands for “Objectively Structured Clinical Examination.” OSCEs are very helpful in medical education because they allow a student to practice and demonstrate clinical skills in a standardized medical scenario.

#### **3. OSVE**

OSVE stands for “Objectively Structured Viva Examination”. In the viva you have to answer questions and engage with your examiners.

#### **4. EOR**

**End-of-Rotation (EOR)** assessments are summative evaluations conducted at the conclusion of a clinical rotation or academic module. These assessments aim to measure the knowledge, skills, attitudes, and clinical competencies a student has acquired over the duration of the rotation.



# **ASSESSMENT POLICY AND TOS OF UHS**

### **13. Assessment Policy (UHS)**

#### **Statutes**

1. The third Professional MBBS Examination shall be held at the end of the third year.
2. Every candidate shall be required to study contents of Anatomy (including Histology), Physiology, Biochemistry, Behavioral Sciences, Community Medicine & Public Health, Pathology including microbiology, Pharmacology & Therapeutics, Ophthalmology, Otorhinolaryngology, Surgery, Medicine, Clinical skills and Professionalism, Ethics, Research and Leadership. The teaching and assessment shall be done in three modular blocks.
3. There will be three papers in the third professional examination:

#### **Third Professional Exam:**

- a) Paper 1 will be based on contents of Block 7;
- b) Paper 2 will be based on contents of Block 8;
- c) Paper 3 will be based on contents of Block 9;
4. Each paper will comprise of two components “Written” and “Oral/Practical/Clinical” examinations.
5. The Written and ‘Oral/Practical/Clinical’ examination in each paper will carry 175 marks each, making the total marks of 350 for each of the papers 7,8, and 9 (inclusive of Internal Assessment).
6. Total marks for the Third Professional Examinations shall be 1050.
7. Major content areas of the third professional years shall be from:
  - a) Pharmacology including applied/clinical Pharmacology;
  - b) Pathology including microbiology;
  - c) Community Medicine and Public Health
  - d) Forensic Medicine.
8. The Applied/Clinical content shall be based on clinical correlations.
9. Integrated clinical content areas include General Medicine, General Surgery, Community Medicine & Public Health, Pathology, Pharmacology & Therapeutics, Clinical Rotations (C- FRC– III), PERLs- III, Expository writing, and IT.

#### **Written Examination**

- a) The written component of Papers 7, 8, and 9 will consist of 'One-best- type' Multiple Choice Questions (MCQ) and Structured Essay Questions (SEQ) in a ratio of 65:35 %.
- b) Each MCQ will have five options (one best response and four distractors) and will carry one (01) mark.
- c) There will be no negative marking.
- d) Each SEQ will be a structured question with five (05) marks each.
- e) SEQ's will only be based on the major content areas of the year.
- f) There will be total of 90 MCQs and 10 SEQs in every written paper in Papers 7, 8, and 9.
- g) The duration of each written paper will be 190 minutes (03 hours and 10 minutes).
- h) The section 'B' of the MCQs and the section 'B' of the SEQs must be passed independently also to be declared as 'pass' in the theory exam.
- i) The MCQ section will be 90 minutes duration and the SEQ section of 100 minutes.

#### **Oral/Practical/Clinical Examination**

- a) The 'Oral/Practical/Clinical' component of each Papers 7, 8, and 9 will consist of a total of fifteen (15) OSPE/OSCE/OSVE stations in each 'Oral/Practical/Clinical' examination.
- b) There will be eleven (11) Observed OSPE/OSCE (Objective Structured Practical Examination Objective Structured Clinical Examination) stations from major subject areas. Each OSPE/OSCE station will have the practical component and an evaluation of the underlying principle relevant to that practical with a component of applied knowledge.
- c) There will be one (01) Observed OSCE (Objective Structured Clinical Examination) station, based on PERLs-3 & ExposITory-3 in each 'Oral/Practical/Clinical' examination.
- d) There will be three (03) Observed interactive OSVE (Objective Structured Viva Examination) from major subject areas. Each OSVE station will have a structured viva, to assess a practical component along with evaluation of the underlying principle relevant to that practical with a component of applied/practical knowledge and related clinical application.
- e) OSPE/OSCE station from the major subject areas will carry eight (08) marks.
- f) The OSCE station of PERLs-3 & ExposITory-3 will carry ten (10) marks.

- g) Each OSVE station will carry fourteen (14) marks
- h) The duration of each “Oral/Practical/Clinical” examination will be 120 minutes (2 hours).
- i) Time for each OSPE, OSCE and OSVE station will be eight (08) minutes.
10. Every candidate shall take the examination in the following Blocks (Modules) in the third Professional MBBS Examinations.

3 <sup>rd</sup> Year MBBS		
	Block 7	Marks
A	(Foundation-II + Hematopoietic, Immunity & Implant + General Pharmacology + Forensic Medicine & Toxicology- I)	350
B	Block 8 (Musculoskeletal & Locomotion-II + Infectious Diseases + Neoplasia + Forensic Medicine & Toxicology - II)	350
C	Block 9 (Cardiovascular-II + Respiratory II + Community Medicine & Public Health + Family Medicine I + Forensic Medicine & Toxicology - III)	350
	<b>Total</b>	<b>1050</b>

**A. Block 7 (Foundation-II + Hematopoietic, Immunity & Implant + General Pharmacology + Forensic Medicine-I)**

The examination in Block 7 shall be as follows: -

- a) One written paper of 140 marks having two parts:
- i. Part I shall have ninety Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 90 minutes. There will be no negative marking.
  - ii. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 110 minutes.
- b) “Oral/Practical/Clinical” examination shall have 140 marks in total.

- c) The continuous internal assessment through 'Block Examination' and other parameters specified, conducted by the college of enrollment shall carry 70 marks, i.e., 20% of the total allocated marks (350) for the block. The score will be equally distributed to the Written and 'Oral/Practical/Clinical' Examinations.

**B. Block 8 (Musculoskeletal & Locomotion--II + Infectious Diseases + Neoplasia+ Forensic Medicine - II)**

The examination in Block 8 shall be as follows: -

- a) One written paper of 140 marks having two parts:
- i. Part I shall have ninety Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 90 minutes. There will be no negative marking.
  - ii. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 110 minutes.
- b) "Oral/Practical/Clinical" examination shall have 140 marks in total.
- c) The continuous internal assessment through 'Block Examination' and other parameters specified, conducted by the college of enrollment shall carry 70 marks, i.e., 20% of the total allocated marks (350) for the block. The score will be equally distributed to the "Written" and "Oral/Practical/Clinical" Examinations.

**C. Block 9 (Cardiovascular -II + Respiratory II + Community Medicine & Public Health + Family Medicine I + Forensic Medicine - II)**

The examination in Block 9 shall be as follows: -

- a) One written paper of 140 marks having two parts:
- i. Part I shall have ninety Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 90 minutes. There will be no negative marking.
  - ii. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 110 minutes.
- b) "Oral/Practical/Clinical" examination shall have 140 marks in total.
- c) The continuous internal assessment through 'Block Examination' and other parameters specified, conducted by the college of enrollment shall carry 70 marks, i.e., 20% of the total allocated marks (350) for the block. The score will be equally distributed to the "Written" and "Oral/Practical/Clinical" Examinations.

11. The marks distribution in each subject is given in Table 1

**Table 1**

YEAR-3						
Subject	Theory		Practical			Total
<b>BLOCK 7</b> <b>Modules</b> (Foundation-II + Hematopoietic, Immunity & Implant + General & Clinical Pharmacology + Forensic Medicine & Toxicology-I)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE	Marks	<b>350</b>
					88	
	Part II SEQs (10)	50 Marks		01 OSCE	10	
				03 OSVE	42	
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	<b>175</b>	Total	<b>175</b>		
<b>BLOCK 8</b> <b>Modules</b> (Neoplasia + Infectious Diseases + Musculoskeletal & Locomotion-II + Forensic Medicine & Toxicology-II)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE	Marks	<b>350</b>
					88	
	Part II SEQs (10)	50 Marks		01 OSCE	10	
				03 OSVE	42	
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	<b>175</b>	Total	<b>175</b>		
<b>BLOCK 9</b> <b>Modules</b> (Cardiovascular -II + Respiratory II + Community Medicine & Public Health + Family Medicine I + Forensic Medicine & Toxicology- III)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE	Marks	<b>350</b>
					88	
	Part II SEQs (10)	50 Marks		01 OSCE	10	
				03 OSVE	42	
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	<b>175</b>	Total	<b>175</b>		
<b>Total Marks:</b>						<b>1050</b>

12. No grace marks shall be allowed in any examination or practical under any guise or name.
13. At least 50% MCQs & 50% SEQs shall be based on applied/clinical/case scenario to assess high order thinking in the papers set for the students of Third Professional MBBS Examinations.



## **14. Exam Regulations by UHS**

### **Regulations**

1. Professional examination shall be open to any student who: -
  - a) Has been enrolled/registered and completed one academic year preceding the concerned professional examination in a constituent/affiliated college of the University.
  - b) Has his/her name submitted to the Controller of Examinations, for the purpose of examination, by the Principal of the college in which he / she is enrolled & is eligible as per all prerequisites of the examination?
  - c) has his/her marks of internal assessment in all the Blocks sent to the Controller of Examinations by the Principal of the college along with the admission form.
  - d) Produces the following certificates duly verified by the principal of his / her college:
    - i. Of good character;
    - ii. Of having attended not less than cumulative 85% of the full course of lectures delivered and practical conducted in the academic session, while maintaining 75 % attendance in each block,
    - iii. Certificate of having appeared at the Block Examinations conducted by the college of enrolment with at least 55 % cumulative percentage in aggregate of blocks 7,8, and 9 for the third year;
    - iv. Candidates falling short of block/s attendance shall not be admitted to the annual examination unless they take remedial classes to complete the requirement.
2. The minimum number of marks required to pass the professional examination for each paper shall be fifty-five percent (55%) in Written and fifty-five percent (55%) in the 'Oral/Practical/Clinical' examinations and fifty-five percent (55%) in aggregate, independently and concomitantly, at one and the same time.
3. Candidates who secure eighty five percent (85%) or above marks in any of the papers shall be declared to have passed "with distinction" in that Block, subject to having at least 80 % marks in the written component of that paper, concomitantly. However, no candidate shall be declared to have passed "with distinction" in any paper, who does not pass in all the papers of the Professional Examination as a whole at one and the same time,
4. A candidate failing in one or more paper of the annual examination shall be provisionally allowed to join the next professional class till the commencement of supplementary

examinations. Under no circumstances, a candidate shall be promoted to the next professional class till he / she has passed all the papers in the preceding professional examination.

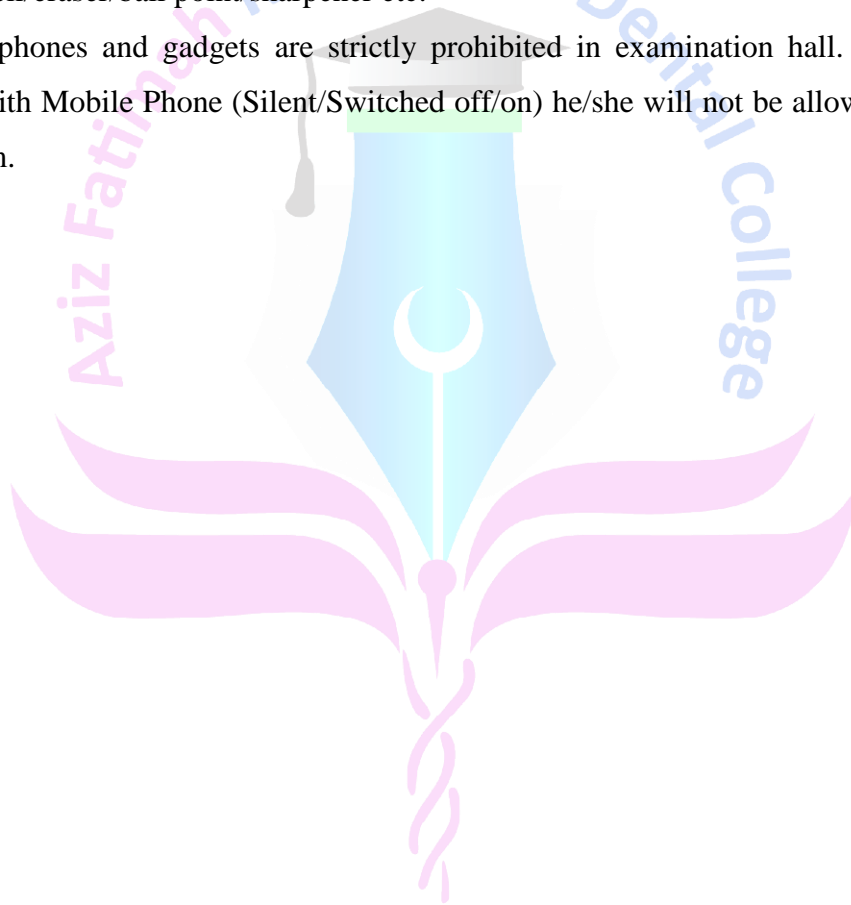
5. If a student appears in the supplementary examination for the first time as he/she did not appear in the annual examination because of any reason and fails in any paper in the Supplementary Examination, he/she will be detained in the same class and will not be promoted to next class.
6. The colleges may arrange remedial classes and one re-sit for each block examination after approval from the Competent Authority.
7. The remedial classes and re-sit examination can be conducted during summer vacation/weekends, before or during preparatory leave, for the concerned professional examination, subject to the following conditions:
  - a) At the completion of each block, the principals of the colleges shall submit a detailed report to the university, including cases of students with short attendance, poor performance/absence in the block examination along with the reasons and evidence for the same, proposed schedule for remedial classes and re-sit examination.
  - b) Competent Authority UHS will have the cause and the submitted evidence evaluated and documented, before permitting the colleges to arrange remedial classes and re-sit examination at the concerned block. No college is allowed to conduct remedial classes or re-sit examination without prior approval of the competent authority.
  - c) The students can appear in remedial classes / re-sit of a block examination, however, conduct of remedial classes shall be permitted only in the cases of students, who shall have attended at least 50 % of total attendance of the concerned block in the first instance.
    - i. However, in special circumstances a student can be allowed to attend the 'remedial classes' for a certain block, with the permission of the Competent Authority, to complete his/her requirement of attendance, even if the block attendance is less than 50%. In such cases, the evidence of reason will be provided by the college after the Principal has endorsed the case.
    - ii. The students who have attained a cumulative attendance of 85% directly or with remedial classes, can appear in the 'annual' professional examination.
    - iii. The valid reasons for short attendance in a block or absence from a block examination may include major illness/accident/surgery of the student or sickness / death of an immediate relative/being afflicted by a natural/man- made

calamity or disaster or detained students (missed the first block of the year) or UHS permitted late admission students

8. The application for admission of each candidate for examination shall be submitted to the Controller of Examination, through the Principal of the College, in a prescribed format, as per notified schedule, accompanied by the prescribed fee.
9. The marks of internal assessment through block/s examination and attendance shall be submitted to Controller of Examinations three times, within two weeks of completion of each block examination.
10. At the end of each block, the colleges are required to submit question papers and keys for the block examination, internal assessment marks and attendance record to the Department of Examinations UHS. Further, parent-teacher meetings shall be arranged by the colleges after every block examination to share feedback on the progress of students with their parents. Minutes of parent teacher meetings shall be submitted to the Department of Medical Education UHS.
11. It is emphasized that fresh internal assessment or a revision of assessment for supplementary examination shall not be permissible. However, a revised internal assessment for the detained students can be submitted. The internal assessment award in a particular year will not be decreased subsequently detrimental to the detainee candidate. A proper record of the continuous internal assessment shall be maintained by the concerned department/s in the colleges.
12. The candidates shall pay their fee through the Principal of their respective Colleges who shall forward a bank draft / pay order / crossed cheque in favor of Treasurer, University of Health Sciences Lahore, along with their Admission Forms.
13. Only one annual and one supplementary of First, Second & Third Professional MBBS Examinations shall be allowed in a particular academic session. In exceptional situations, i.e., national calamities, war or loss of solved answer books in case of accident, special examination may be arranged after having observed due process of law. This will require permission of relevant authorities, i.e., Syndicate and Board of Governors.
14. The internal assessment for third year will be sent according to the following scheme:

### **15. Examination Rules AFMDC**

- Students must report to examination hall/ venue at least 30 minutes before the exam.
- Exam will start sharp at time.
- Late comers arriving at the examination hall more than 15 minutes after the start of the paper will not be allowed to enter the examination hall.
- All students should wear Lab coats before appearing in the exam.
- Students are not allowed to take into the examination hall textbooks, notes or manuscript of any kind.
- Students must bring the necessary stationary items for exam with them e.g. pen/pencil/eraser/ball point/sharpener etc.
- Mobile phones and gadgets are strictly prohibited in examination hall. If any student found with Mobile Phone (Silent/Switched off/on) he/she will not be allowed to continue the exam.

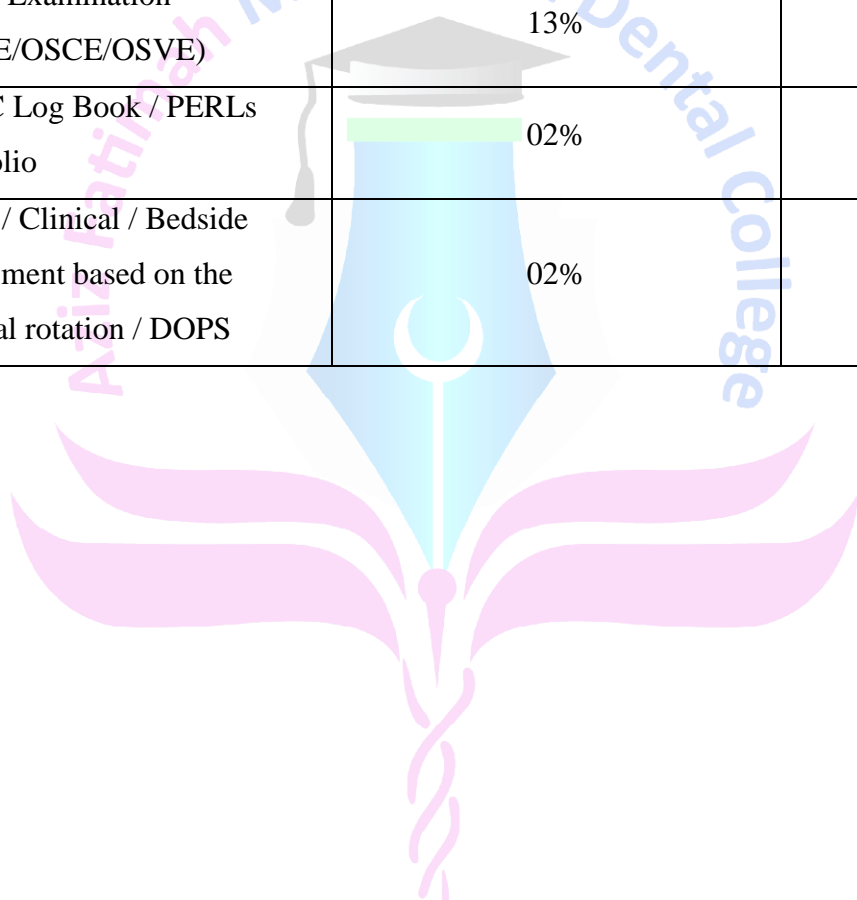


### 16. Internal Assessment Policy (UHS)

Internal Assessment (Theory)			
Sr #	Scoring Parameter	Marks out of 20%	Marks distribution
1	Attendance in Lectures	85-90%=1%, > 90%=2%	85-90%= 01 mark > 90%=02 marks
		Remedial classes – re-sit examination allowed only after case endorsed and submitted by the college Principal and approval given by the Competent Authority. However, no marks given	
		Remedial classes – re-sit exam allowed only in genuine cases after approval from Competent Authority. However, no marks given	
2	Block Examination	15%	27
3	Continuous Internal Assessment/Class Quiz/Class participation/ Professional Behaviors/ Ethical practices/ Leadership traits/ Module Exam Discipline/Punctuality	3%	06

Internal Assessment (Practical & Behavioral)			
Sr #	Scoring Parameter	Marks out of 20%	Marks distribution
1	Attendance in Practical & Rotations	85-90%=1%, > 90%=2%	85-90%= 01 mark > 90%=02 marks
		Remedial classes – re-sit examination allowed only after case endorsed and submitted by	

		the college Principal and approval given by the Competent Authority. However, no marks given	
		Remedial classes – re-sit exam allowed only in genuine cases after approval from Competent Authority. However, no marks given	
2	Block Examination (OSPE/OSCE/OSVE)	13%	23
3	CFRC Log Book / PERLs Portfolio	02%	06
4	Ward / Clinical / Bedside assessment based on the clinical rotation / DOPS	02%	04

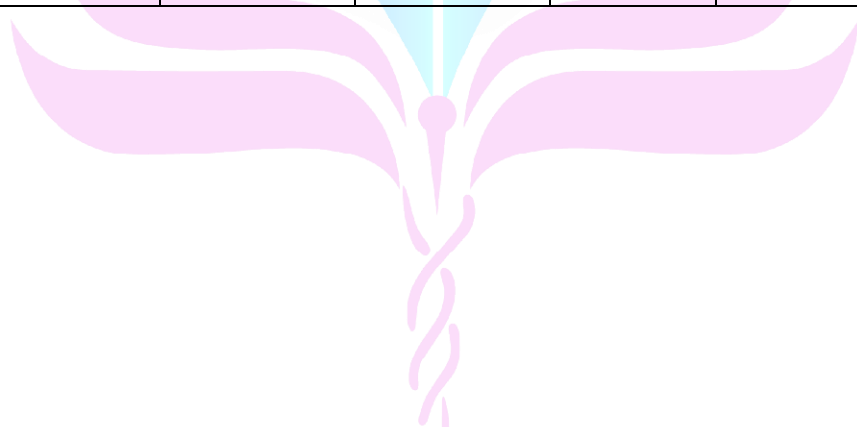


### 17. Table of Specification (TOS)

MBBS 3rd Professional							
Block-7							
Subject	Written Exam			Oral/Practical/Clinical Exam			
	MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE /OSCE (8 marks each observed)	OSCE (10 marks each observed)	OSVE (14 marks each observed)	Marks
Pharmacology	30	05	55	03	-	01	38
Pathology	30	04	50	03	-	01	38
Family Medicine	-	-	-	-	-	-	-
Community Medicine	02	-	02	01	-	-	08
Surgery	05	-	05	01	-	-	08
Medicine	05	-	05	01	-	-	08
Forensic	13	01	18	01	-	01	22
Behavioral	02	-	02	-	-	-	-
Patient Safety	03	-	03	-	-	-	-
CFRC	-	-	-	01	-	-	08
PERLs + Expository	-	-	-	-	01	-	10
<b>Total</b>	<b>90</b>	<b>10x5=50</b>	<b>140</b>	<b>11 stations x 08 = 88</b>	<b>01 stations x 10 = 10</b>	<b>03 stations x 14=42</b>	<b>140</b>

### 18. Frame work of Block 7 3<sup>rd</sup> Year MBBS Timetable 2024-25

DAY	1	2	3	4	5	
	08:00 - 09:00	09:00 - 10:00	10:00 - 11:30	11:30 - 12:00	12:00 - 02:00	
Monday	Forensic Medicine Lecture	Pharmacology Lecture	Practical	Break/Transportation Time	Ward	
Tuesday	Pathology Lecture	Pharmacology Lecture	Practical		Ward	
Wednesday	Pharmacology Lecture	Pathology Lecture	Practical		Ward	
DAY	1	2	3	4	5	6
	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:30	12:30 - 01:00	01:00 - 02:00
Thursday	Pharmacology Lecture	Pathology Lecture	Forensic Medicine Lecture	Tutorial	Break/Namaz Break	PERL's Lecture
DAY	1	2	3	4	5	6
	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 11:30	11:30 am - 01:00 pm	
Friday	Pathology Lecture	Forensic Medicine Lecture	Pathology Lecture	SDL	Tutorial	
DAY	1	2	3	4	5	6
	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:30	12:30 - 01:00	01:00 - 02:00
Saturday	General Medicine/General Surgery Lecture	Pathology Lecture	Pharmacology Lecture	Tutorial	Break/Namaz Break	BS/Community Medicine



### 19. Clinical Ward Rotation of 3<sup>rd</sup> Year MBBS 2024-25

#### Batch Wise Distribution of 3rd Year MBBS for Practical / Tutorials for Session 2024-2025

Batch A	Batch B	Batch C
21064, 21066, 21067	21104, 21105, 21139,	21141, 21152,
22001 - 22050	22051 - 22099	22100 - 22150

#### Group Wise Distribution of 3rd Year MBBS for Ward Rotation for Session 2024-2025

Groups	Sub - Groups	
<b>Group A</b>	<b>Group A1</b>	<b>Group A2</b>
21064, 21066, 21067, 21104	21064, 21066	21067, 21104
22001 - 22036	22001 - 22018	22019 - 22036
<b>Group B</b>	<b>Group B1</b>	<b>Group B2</b>
21105, 21139, 21141, 21152	21105, 21139	21141, 21152
22037 - 22073	22037 - 22055	22056 - 22073
<b>Group C</b>	<b>Group C1</b>	<b>Group C2</b>
22074 - 22111	22074 - 22092	22093 - 22111
<b>Group D</b>	<b>Group D1</b>	<b>Group D2</b>
22112 - 22150	22112 - 22130	22131 - 22150

Note: No change in any group is acceptable. Strict Compliance is required.

### 3rd Year MBBS Ward Rotation

Clinical Rotation	Morning	Evening	Total Duration	Credit Hours
<b>Rotation 1</b> (Medicine)	2 Weeks	2 Weeks	2 Weeks	
<b>Group 1 Specialities</b>				
<b>Rotation 2</b> (Pharmacology/Anaesthesia)	2 weeks=1 Week in each speciality		2 Weeks	
<b>Group 2 Specialities</b>				
<b>Rotation 3</b> (Psychiatry/Community Medicine)	2 weeks=1 Week in each speciality		2 Weeks	
<b>Rotation 4</b> (Surgery)	2 Weeks	2 Weeks	2 Weeks	

Total class will be divided into 4 main groups (A, B, C, D) and each group will be further divided into sub groups (A1, A2, B1, B2, C1, C2, D1, D2)

Note: 3rd Year MBBS will attend evening clinical wards during (Medicine & Surgery) rotations only, for 3 days per week (Monday - Wednesday) from 02:30 - 04:30 pm

### **Group Wise Rotation 3rd Year MBBS**

Rotations	Medicine	Medicine	Group 1 Specialities	Group 1 Specialities	Group 2 Specialities	Group 2 Specialities	Surgery	Surgery
	Medical Unit I	Medical Unit II	Pharmacology	Anaesthesia	Psychiatry	Community Medicine	Surgical Unit I	Surgical Unit II
<b>Rotations 1</b>	A1	A2	B1 (1st week) B2 (2nd Week)	B2 (1st week) B1 (2nd Week)	C1 (1st week) C2 (2nd Week)	C2 (1st week) C1 (2nd Week)	D1	D2
<b>Rotations 2</b>	D1	D2	A1 (1st week) A2 (2nd Week)	A2 (1st week) A1 (2nd Week)	B1 (1st week) B2 (2nd Week)	B2 (1st week) B1 (2nd Week)	C1	C2
<b>Rotations 3</b>	C1	C2	D1 (1st week) D2 (2nd Week)	D2 (1st week) D1 (2nd Week)	A1 (1st week) A2 (2nd Week)	A2 (1st week) A1 (2nd Week)	B1	B2
<b>Rotations 4</b>	B1	B2	C1 (1st week) C2 (2nd Week)	C2 (1st week) C1 (2nd Week)	D1 (1st week) D2 (2nd Week)	D2 (1st week) D1 (2nd Week)	A1	A2

### Clinical Ward Rotation schedule of BLOCK 7 (3rd Year MBBS) Session 2024-25

<b>Clinical Ward Rotation</b>	
1st Rotation	3rd, 5th & 7th April 2025 (1st Week) 14th April 2025 - 19th April 2025 (2nd Week)
2nd Rotation	21st April 2025 - 26th April 2025 (1st Week) 28th April 2025 - 3rd May 2025 (2nd Week)
3rd Rotation	5th May 2025 - 10th May 2025 (1st Week) 12th May 2025 - 17th May 2025 (2nd Week)
4th Rotation	19th May 2025 - 24th May 2025 (1st Week) 26th May 2025 - 31st May 2025 (2nd Week)

### Department wise Competencies of Block 7

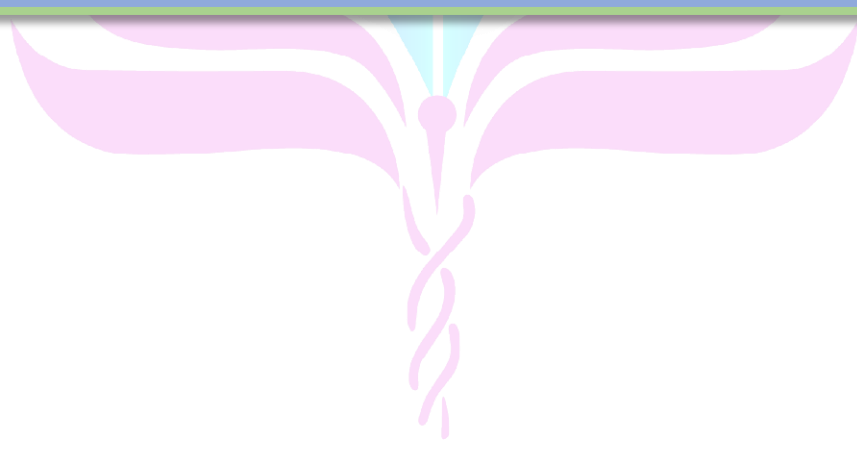
Subjects	CFRC3	Ward rotations
<b>Medicine</b>	(CFRC3-009) Take detailed patient history and perform general physical exams (CFRC3-010) Understand fluid compartments and the basics of electrolyte balance. (CFRC3-012) Perform and interpret measurements of vital signs (e.g., BP, pulse, temperature, respiratory rate). (CFRC3-013) Recognize abnormal vital signs and escalate care accordingly. (CFRC3-061) General physical examination (Medicine)	1. (F2-M-003) History taking skills 2. (F2-M-004) Approach to patient
<b>Surgery</b>	1. (CFRC3-014) Perform basic blood sampling (e.g., venipuncture) with proper aseptic technique CFRC3-023 Wound management and suturing CFRC3-024 History of infections related to surgical wounds CFRC3-026 inspecting and diagnosing surgical wound infections CFRC3-027 Antimicrobial prophylaxis and post-surgical infection management.	1. (F2-S-004) Enlist Suture types & techniques 2. (F2-S-005) Classify Wound Dressings & its protocols

<b>Pharmacology</b>	<p>(CFRC3-001) Prescribing antihypertensives (CFRC3-002) Prescribing antibiotics for infection (CFRC3-003) Monitoring for drug side effects (CFRC3-004) Adjusting medications based on response (CFRC3-005) Knowledge of common drug classes relevant to foundational clinical care (e.g., antibiotics, analgesics, antihypertensives). (CFRC3-006) Ability to calculate and adjust dosages for common medications based on patient factors</p>	
<b>Anaesthesia</b>	<p>(CFRC3-008) Demonstrate appropriate use of PPE and understand its importance in preventing healthcare-associated infections CFRC3-058 Able to scrub in for major and minor surgical procedures CFRC3-059 Assist in minor surgical procedures (observed in OT)</p>	
<b>Psychiatry</b>	<p>CFRC3-054 Effective communication during consultations (shared decision-making) CFRC3-055 Ethical considerations (Confidentiality, informed consent)</p>	
<b>Community Medicine</b>	<p>(CFRC3-007) Perform proper hand hygiene, aseptic techniques, and basic infection control protocols. CFRC3-011) Offer guidance on health maintenance, such as hygiene, nutrition, and medication adherence</p>	<p>HIT-H-007 Administer Blood Products x3 Clinical Audit for indications and transfusion reactions x3</p>



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**RESOURCE BOOKS**



## 20. Learning Resources

<b>Anatomy</b>	<ul style="list-style-type: none"> <li>• Snell’s Clinical Anatomy 10th ed.</li> <li>• Langman’s Medical Embryology 12th ed</li> <li>• Medical Histology by Laiq Hussain Siddiqui 8th edition.</li> <li>• General Anatomy by Laiq Hussain Siddiqui 6th edition.</li> </ul>
<b>Biochemistry</b>	<ul style="list-style-type: none"> <li>• Harpers illustrated Biochemistry (latest edition). Rodwell.V.W MCGrawHill publishers.</li> <li>• Lippincott illustrated Review (latest edition). Kluwer.W.</li> <li>• Essentials of Medical Biochemistry vol 1&amp;2 by Mushtaq Ahmed</li> </ul>
<b>Pathology</b>	<ul style="list-style-type: none"> <li>• Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.</li> <li>• Robbins and Cotran Pathological Basis of Disease. Kumar, V., Abbas, A. and Aster, J. Latest Edition</li> <li>• Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pocket Companion to Pathologic basis of diseases, Saunder Harcourt.</li> <li>• Walter and Israel. General Pathology. Churchill Livingstone.</li> <li>• Robbins &amp; Kumar, Medical Microbiology and Immunology Levinson.</li> </ul>
<b>General Medicine</b>	<ul style="list-style-type: none"> <li>• Principles and Practice of Medicine by Davidson (latest edition)</li> <li>• Clinical Medicine by Parveen J Kumar &amp; Michael Clark</li> <li>• Oxford Handbook of Medicine</li> <li>• Macleod's Clinical Examination book</li> <li>• Medicine and Toxicology by C.K. Parikh</li> <li>• Hutchison's Clinical Methods by Michael Swash. 21st edition</li> </ul>
<b>Pharmacology And Therapeutics</b>	<ul style="list-style-type: none"> <li>• Katzung and Trevor’s Pharmacology: Examination and Board Review- 15th Edition</li> <li>• Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 16th Edition-</li> <li>• Current Medical Diagnosis and Treatment- reference book – Edition-2024</li> <li>• Basic and Clinical Pharmacology by Bertram G Katzung (case</li> </ul>

	<p>scenarios only) - 15th Edition</p> <ul style="list-style-type: none"> <li>• Basic and Clinical Pharmacology by Katzung, McGraw-Hill. 16th Edition</li> <li>• Pharmacology by Champe and Harvey, Lippincott Williams &amp; Wilkins 8th Edition.</li> <li>• Katzung Basic and Clinical pharmacology, Lippincott Illustrated reviews.</li> <li>• Clinical Pathology Interpretations by A. H. Nagi</li> </ul>
<b>Behavioural Sciences</b>	<ul style="list-style-type: none"> <li>• Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition</li> <li>• Medical and Psychosocial aspects of chronic illness and disability 6th edition by Donna R.Falvo and Beverly E.Holland,</li> <li>• Integrating behavioral sciences in healthcare, Asma Humayun,2003, 1st edition</li> </ul>
<b>Community medicine</b>	<ul style="list-style-type: none"> <li>• Parks Textbook of Preventive and Social Medicine. K. Park</li> <li>• Public Health and Community Medicine by Ilyas Ansari</li> <li>• MSDS manual of Government of Punjab</li> <li>• Text book of Community Medicine by Park J E. Latest Edition</li> </ul>
<b>Surgery</b>	<ul style="list-style-type: none"> <li>• Bailey &amp; Love's Short Practice of Surgery (latest edition)</li> <li>• Browse's Introduction to the Symptoms &amp; Signs of Surgical Disease 4th Edition</li> <li>• Bailey &amp; Love Short Practice of Surgery, Clinical Surgery pearls by Dayananda Babu RACS for Surgical Audits.</li> </ul>
<b>Patient Safety</b>	<ul style="list-style-type: none"> <li>• Patient Safety Curriculum Guide: Multi Professional Guide</li> </ul>
<b>Microbiology</b>	<ul style="list-style-type: none"> <li>• Levinson's review of Microbiology</li> <li>• Medical Microbiology and Immunology by Levinson and Jawetz,</li> </ul>
<b>Pediatrics Medicine</b>	<ul style="list-style-type: none"> <li>• Nelson Textbook of Pediatrics</li> <li>• Basis of Pediatrics by Pervez Akbar Khan</li> </ul>
<b>Gynecology</b>	<ul style="list-style-type: none"> <li>• Gynecology by Ten Teachers</li> </ul>
<b>Infection Control</b>	<ul style="list-style-type: none"> <li>• National Guidelines Infection Prevention and control, National Institute of Health Pakistan</li> </ul>

<b>Biosafety</b>	<ul style="list-style-type: none"> <li>• Biosafety in Microbiological and Biomedical Laboratories, 6th Edition (CDC, USA)</li> <li>• WHO Laboratory Biosafety Manual, Fourth Edition, And Associated Monographs</li> <li>• WHO safe management of wastes from healthcare facilities chapter 7 -8 page 77-99, 105-125)</li> </ul>
<b>Family medicine</b>	<ul style="list-style-type: none"> <li>• Oxford Handbook of General Practice, 5th Edition</li> </ul>
<b>Orthopedics</b>	<ul style="list-style-type: none"> <li>• Apley and Solomon's System of Orthopaedics and Trauma by Ashley Blom (Editor)</li> </ul>
<b>Rheumatology</b>	<ul style="list-style-type: none"> <li>• Davidson's Principles and Practice of Medicine</li> <li>• Clinical Medicine by Parveen J Kumar &amp; Michael Clark</li> <li>• Hutchison's Clinical Methods by Michael Swash</li> </ul>
<b>Radiology</b>	<ul style="list-style-type: none"> <li>• Aids to Radiological Differential Diagnosis by Chapman S. and Nakielny R. 4th edition. Elsevier Science Limited; 2003</li> </ul>
<b>Forensic Medicine</b>	<ul style="list-style-type: none"> <li>• Knight's Forensic Pathology by Barnard Knight 3rd edition</li> <li>• G. Principles and Practice of Forensic Medicine by Prof. NasibR. Awan, 2nd edition</li> <li>• Forensic DNA Typing – 2nd Edition, Author: John M. Butler</li> <li>• Parikh's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology by C.K. Parikh 6th Ed., CBS Publisher.</li> <li>• Gun Shot Wounds 2nd edition by V.J.Deimaio</li> <li>• Knight B. Simpson's Forensic Medicine.</li> <li>• Knight and Pekka. Principles of Forensic Medicine</li> </ul>
<b>Forensic Pathology</b>	<ul style="list-style-type: none"> <li>• Forensic pathology 2nd edition by V.J.Deimaio CRC press Boca Raton London New York Washington DC</li> </ul>
<b>Toxicology</b>	<ul style="list-style-type: none"> <li>• Principles of clinical toxicology 3rd edition Thomas. Gossel CRC press Taylor and Francis group</li> </ul>
<b>Forensic Sciences</b>	<ul style="list-style-type: none"> <li>• Fundamentals of Forensic Science- 3rd Edition: Author: Max M Houck, Jay A. Siegel</li> <li>• Text Book of forensic medicine and toxicology Principles and Practice 5th edition by Krishan Vig</li> </ul>
<b>Biomedical ethics</b>	<ul style="list-style-type: none"> <li>• Principles of Biomedical ethics, 8th edition by Tom. L.</li> </ul>

	Beauchamp, James F. Childress.
<b>Evidence Based Medicine</b>	<ul style="list-style-type: none"> <li>• Databases for the latest articles/manuscripts</li> <li>• Clinical Practice Guidelines- local and international - (within last 3 years)</li> <li>• Books (Latest edition-within last 5 years)</li> </ul>
<b>Pediatrics</b>	<ul style="list-style-type: none"> <li>• Nelson's Book of Pediatric 22 edition Illustrated book of Pediatrics, Pervaiz Akbar textbook peds medicine</li> </ul>
<b>Islamiyat</b>	<ul style="list-style-type: none"> <li>• Standard Islamiyat (compulsory) for B.A, BSc, MA, MSc, MBBS by Prof M Sharif Islahi</li> <li>• IImi Islamiyat (compulsory) for BA, BSc &amp; equivalent.</li> </ul>

