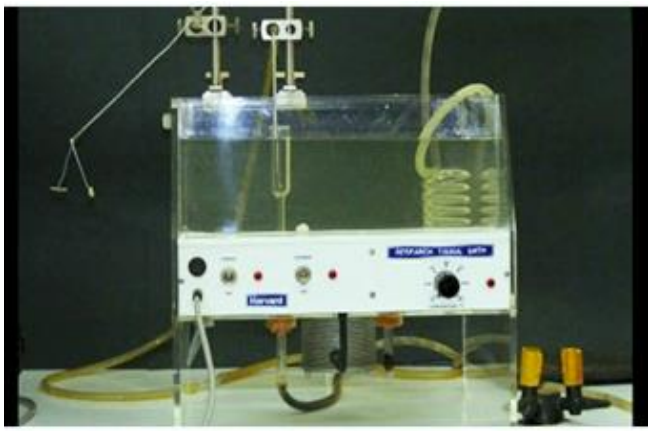
LAHORE
MEDICAL & DENTAL
COLLEGE

STUDY GUIDE 2025

BLOCK-07



LAHORE MEDICAL AND DENTAL COLLEGE, LAHORE

Mission of LMDC

The Lahore Medical & Dental College is committed in its pursuit of excellence to providing the best academic facilities and atmosphere to its students.

Our mission is to: “Train future leaders of medicine who set new standards in knowledge, care and compassion”.

The well qualified and committed faculty of LMDC provides combination of nurturing support and challenge to the students to reach their maximum potential.

Contents:-

1. Introduction to the Study Guide:-

As UHS has introduced modular integrated MBBS curriculum 2023 from the academic session 2024-2025 and version 3.0 is released in 2025, the study guide for Block -07 is developed in order to introduce the 3rd Year MBBS students to various modules and block in the Year 3. The learning Objectives of all the Subjects included in Block -07 are added to help learners focus on key areas.

Time tables for both the modules in Block -07 are added and total contact hours for each subject are given in a tabulated manner. The book and other reading resources are mentioned to facilitate the students. Assessment tools, policy and schedule are also included. Moreover, table of specifications (TOS) for Block-07 examination is added to facilitate the learners.

2. Departmental Faculty & Staff

Department Of Physiology

- Prof. Dr. Anser Asrar (HOD/Professor)
- Prof. Dr. Uzma Zargham (Professor)
- Prof. Dr. Zaima Ali (Professor)
- Dr. Attiqa Khalid (Associate Professor)
- Dr. Sadia Nazir (Associate Professor)
- Dr. Asma Akram (Assistant Professor)

Department Of Anatomy

- Prof. Dr. Iffat Badar (HOD/Professor)
- Prof. Dr. Aruna Bashir (Professor)
- Dr. Anis Fatima (Associate Professor)
- Dr. Shumaila Shakoor (Assistant Professor)
- Dr. Anum Dogar (Assistant Professor)
- Dr. Shumaila Ijaz (Assistant Professor)

Department Of Biochemistry

- Prof. Dr. Rubina Bashir (HOD/Professor)
- Prof. Dr. Sobia Imtiaz (Professor)
- Dr. Mahwish Shahzad (Assistant Professor)
- Dr. Khaulah Qureshi (Assistant Professor)

Department Of Pharmacology

- Prof. Dr. Ajaz Fatima (HOD/Professor)
- Prof. Dr. Shazia Asim (Professor)
- Dr. Asia Firdous (Associate Professor)
- Dr. Quratulain Mehdi (Assistant Professor)
- Dr. Ovais Qarni (Senior Lecturer)

Department Of Pathology

- Prof. Dr. Shazia Nilofar Ibne Rasa (HOD/Professor Histopathology)
- Prof. Dr. Saadia Chaudhary (Professor Microbiology)
- Prof. Dr. Fauzia Sadiq (Professor Chemical Pathology)
- Prof. Dr. Muhammad Shahbaz Amin (Professor Histopathology)
- Dr. Nazia Ahmad (Associate Professor Haematology)
- Dr. Zahid Asgher (Assistant Professor Histopathology)
- Dr. Sonia Tahir (Assistant Professor Microbiology)
- Dr. Muhammad Rizwan (Assistant Professor Histopathology)

- Dr. Maimoona Aslam (Assistant Professor Histopathology)

Department Of Forensic Medicine

- Prof. Dr. Amir Bashir (Forensic Medicine Dept.)
- Assist. Prof. Dr. Roman Ashraf (Forensic Medicine Dept.)

Department Of Community Medicine

- Prof. Dr. Seema Daud (HOD/Professor)
- Dr. Humayun Mirza (Associate Professor)
- Dr. Umbreen Navied (Assistant Professor)
- Dr. Saadia Maqbool (Assistant Professor)

Department Of Medical Education

- Dr. Nighat Nadeem (Associate Professor)

Department Of Medicine

- Prof. Dr. Waseem Amir (HOD/Professor)
- Prof. Dr. Asad Ullah Ijaz (Professor OPS)
- Prof. Dr. Sarah Shoaib (Professor OPS)
- Prof. Dr. Ijaz Ahmed (Professor OPS)
- Prof. Dr. Rizwan Akram (Professor OPS)
- Prof. Dr. Atiq-Uz-Zaman (Professor OPS)
- Dr. Abdullah Shah (Associate Professor OPS)

Department Of Surgery

- Prof. Dr. Hasnat Ahmad Butt (HOD/Professor)
- Prof. Dr. Saquib Zahoor (Professor)
- Prof. Wasif Majeed Chaudhry (Professor)
- Dr. Sidra Shoaib (Professor)

Department Of Behavioural Sciences

- Prof. Dr. Maj. R . Maqbool Ahmad (HOD/Professor)

Department Of Radiology

Prof. Dr. Khalid Farooq (HOD/Professor)

Department Of Pediatrics

Prof. Rizwan Waseem (HOD/Professor)

3. List of Abbreviations

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_2	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	Orthopaedic
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 in hibitors
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	Tumour, 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

4. Introduction to the Block -07:-

Course Name: Block -07

Year: Year -03

Level of Students: Third Year MBBS

Duration of Block -07:- 24th of March 2025 to 09th of May 2025.

MODULES BLOCK -07	DURATION
Foundation-II & EPOM	24th of March 2025 to 4th of April 2025
General & Clinical Pharmacology	9th of April 2025 to 25th of April 2025
Hematopoietic, Immunity & Transplant	28th of April 2025 to 2nd of May 2025
Forensic Medicine & Toxicology	5th of May 2025 to 9th of May 2025.

5. *Curriculum Frame Work for 3rd Year*

Year	Block	Module
Year 03	**Block-07**	• FOUNDATION-2 & EBM • GENERAL & CLINICAL PHARMACOLOGY • HEMATOPOIETIC & IMMUNITY & TRANSPLANT • FORENSIC MEDICINE & TOXICOLOGY -3
Year 03	**Block-08**	• Neoplasia • NEFECTIOUS DISEASE • MUSCULOSKELETAL & LOCOMOTION -2 • FORENSIC MEDICINE & TOXICOLOGY -3
Year 03	**BLock-09**	• CARDIOVASCULAR -2 • RESPIRATORY -2 • COMMUNITY MEDICINE & FAMILY HEALTH -1 • FORENSIC MEDICINE & TOXICOLOGY -3
Year 03	**Spiral**	• PERLS-3 • Expository -3 • C-FRC-3 (Clinical- Foundation, Rotation, Clerkships)

6. Committees

Block -07 (MODULE-12)

Module:-Foundation-II & EBM

List of Committees Members:-

- Coordinator 01: Prof. Dr. Ajaz Fatima (Pharmacology Dept.)
- Coordinator 02: Assoc. Prof. Dr. Asia Firdous (Pharmacology Dept.)

Representative:-

- Prof. Dr. Shazia Ibne- Rasa (Pathology Dept.)
- Assistant Prof. Dr. Sonia (Pathology Dept.)
- Prof. Dr. Ajaz Fatima (Pharmacology Dept.)
- Assoc. Prof. Dr. Asia Firdous (Pharmacology Dept.)
- Prof. Dr. Seema Daud (Community Medicine Dept.)
- Assoc. Prof. Dr. Humayun Mirza (Community Medicine Dept.)
- Prof. Dr. Amir Bashir (Forensic Medicine Dept.)
- Prof. Dr. Waseem Amir (Medicine Dept.)
- Dr. Sara (Medicine Dept.)
- Prof. Dr. Hasnat (Surgery Dept.)
- Dr. Sidra Shoaib (Surgery Dept.)
- Prof. Dr. Maqbool (Psychiatry Dept.)
- Miss. Ramla (Behavioral Sciences.)
- Prof. Dr. Rizwan (Peads Dept.)

Block -07 (MODULE-13)

Module:-General & Clinical Pharmacology.

List of Committees Members:-

- Coordinator 01: Prof. Dr. Ajaz Fatima (Pharmacology Dept.)
- Coordinator 02: Assoc. Prof. Dr. Asia Firdous (Pharmacology Dept.)

Representative:-

- Prof. Dr. Shazia Ibne- Rasa (Pathology Dept.)
- Prof. Dr. Sonia (Pathology Dept.)
- Prof. Dr. Seema Daud (Community Medicine Dept.)
- Dr. Humayun Mirza (Community Medicine Dept.)
- Prof. Dr. Amir Bashir (Forensic Medicine Dept.)
- Prof. Dr. Waseem Amir (Medicine Dept.)
- Dr. Sara (Medicine Dept.)
- Prof. Dr. Hasnat (Surgery Dept.)
- Dr. Sidra Shoaib (Surgery Dept.)
- Prof. Dr. Maqbool (Psychiatry Dept.)
- Miss Ramla (Behavioral Sciences)

Block -07 (MODULE-14)

Module:-Hematopoietic, Immunity & Transplant

List of Committees Members:-

- Coordinator 01: Prof. Dr. Shazia Ibne- Rasa (Pathology Dept.)
- Coordinator 02: Prof. Dr. Sonia (Pathology Dept.)

Representative:-

- Prof. Dr. Ajaz Fatima (Pharmacology Dept.)
- Assoc. Prof. Dr. Asia Firdous (Pharmacology Dept.)
- Prof. Dr. Seema Daud (Community Medicine Dept.)
- Dr. Humayun Mirza (Community Medicine Dept.)
- Prof. Dr. Amir Bashir (Forensic Medicine Dept.)
- Prof. Dr. Waseem Amir (Medicine Dept.)
- Dr. Sara (Medicine Dept.)
- Prof. Dr. Hasnat (Surgery Dept.)
- Dr. Sidra Shoaib (Surgery Dept.)
- Prof. Dr. Maqbool (Psychiatry Dept.)
- Miss. Ramla (Behavioral Sciences.)
- Prof. Dr. Rizwan (Peads Dept.)

Block -07 (MODULE-15)

Module:-Forensic Medicine & Toxicology-1

List of Committees Members:-

- Coordinator 01: Prof. Dr. Amir Bashir (Forensic Medicine Dept.)
- Coordinator 02: Assist. Prof. Dr. Roman Ashraf (Forensic Medicine Dept.)

Representative:-

- Prof. Dr. Shazia Ibne- Rasa (Pathology Dept.)
- Prof. Dr. Sonia (Pathology Dept.)
- Prof. Dr. Ajaz Fatima (Pharmacology Dept.)
- Assoc. Prof. Dr. Asia Firdous (Pharmacology Dept.)
- Prof. Dr. Seema Daud (Community Medicine Dept.)
- Dr. Humayun Mirza (Community Medicine Dept.)
- Prof. Dr. Waseem Amir (Medicine Dept.)
- Dr. Sara (Medicine Dept.)
- Prof. Dr. Hasnat (Surgery Dept.)
- Dr. Sidra Shoaib (Surgery Dept.)
- Prof. Dr. Maqbool (Psychiatry Dept.)
- Miss. Ramla (Behavioral Sciences.)

Duties Of Module Committees

- Module committee was headed by module coordinators
- Module coordinators were nominated from the subject with the maximum content in the respective module
- Module coordinator developed module team for collaboration and consultation with all the relevant subject
- Module committee assisted in implementation of the curricular guidelines provided by UHS
- Module committee coordinated with the assessment cell in medical education
- Module coordinator helped in developing the study guide in collaboration with department medical education.

7. Teaching & Learning Methodologies

- Interactive Lectures
- Small Group Discussions (Tutorials Sessions)
- Tests (MCQ's , SEQ's & Viva Voce)
- Clinico- Pharmacological Conference
- Skill Laboratories
- Laboratory Practical

Technologies to be Used:-

- We use latest technologies, high speed internet and software for on-line coaching/ teaching.
- Text Books are the Most Important source to learn for this Subject
- Hand Outs (by Senior Faculty Members)
- E. Books (Available)
- Multimedia (Power Point)
- Tables of Drugs Chart
- Departmental Library

8. Learning Resources:

Recommended Books, Handouts, etc.

Anatomy:-

- Langman's Medical Embryology
- Snell's Clinical Anatomy
- Snell's Clinical Neuroanatomy
- Laiq H.S Medical Histology
- Laiq H.S General Anatomy

Physiology:-

- Guyton AC and Hall JE. Textbook of Medical Physiology
- Essentials of Medical Physiology by Mushtaq Ahmad

Biochemistry:-

- Harper's Biochemistry
- Lipponcott's illustrated reviews biochemistry
- ABC of clinical genetics by H.M Kingston

Pathology:-

- Vinay Kumar, Abul K. Abbas and Nelson Fausto. Robbins and Cotran, Pathologic basis of Disease.
- Richard Mitchell, Vinay Kumar, Abul K. Abbas and Nelson Fausto. Robbins and Cotran, Pocket companion to pathologic basis of disease.
- Walter and Israel General Pathology

Pharmacology:-

- Goodman & Gilman's - The Pharmacological Basis of Therapeutics
- Basic & Clinical Pharmacology by Bertram G, Katzung
- Clinical Pharmacology by DR Lawrence, PN Bennett & MJ Brown
- Essentials of Medical Pharmacology by K.D. Tripathi
- Lippincott Illustrated Review Pharmacology

Behavioral Sciences:-

- Handbook of behavioral Sciences by Prof. Mowadat
- Medical and Psychosocial Aspects of Chronic illness and Disability

Community Medicine:-

- Parks Test book of Preventive and Social Medicine
- Public Health and Community Medicine ilyas

Surgery:-

- Bailey & Love' short practice of surgery

Medicine:-

- Davidson's Principles and Practice of Medicine

9. *Learning Outcomes and Themes of Block -07*

MODULE NO. 12: Foundation-II & EBM

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.

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.

SUBJECT INTEGRATED IN THE MODULE:

1. Pharmacology & Therapeutics
2. Biochemistry
3. Physiology
4. Behavioural Sciences
5. General Medicine

IMPLEMENTATION TOR's

- The time calculation for completion of modules and blocks **is based on 35 hours per week**. Total hours of teaching, learning and formative/summative **internal assessment to be completed in a year are 1200**.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

10. *Learning Outcomes and Themes of Block -07*

MODULE NO. 13: General & Clinical Pharmacology.

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 Pharmacogenetics 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.

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 pharmacodynamic principles to predict drug effects and optimize therapy.
- Understand different types of drugs that act on the autonomic nervous system and their clinical usage.

SUBJECT INTEGRATED IN THE MODULE:

6. Pharmacology & Therapeutics
7. Biochemistry
8. Physiology
9. Behavioural Sciences
10. General Medicine

IMPLEMENTATION TOR's

- The time calculation for completion of modules and blocks **is based on 35 hours per week**. Total hours of teaching, learning and formative/summative **internal assessment to be completed in a year are 1200**.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.

- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

11. *Learning Outcomes and Themes of Block -07*

MODULE NO:- 14: HEMATOPOIETIC IMMUNITY & TRANSPLANT

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.

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 and interpret the data regarding 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.

SUBJECTS INTEGRATED IN THE MODULE:-

1. Pharmacology & Therapeutics
2. General Medicine
3. General Surgery
4. Biochemistry

IMPLEMENTATION TOR's:-

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

12. *Learning Outcomes and Themes of Block -07*

MODULE NO:- 15: Forensic Medicine & Toxicology

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.

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

Subject Integrated in the Module:-

1. Anatomy
2. Biochemistry
3. Pathology
4. Medicine

IMPLEMENTATION TOR's:-

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.

- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

13.Learning Objectives:

MODULE NO. 12: Foundation-II & EBM

Syllabus:-

PHARMACOLOGY		
CODE	**TOPIC**	**Specific Learning Outcomes**
F2-Ph-001	Introduction	Define Pharmacology, different branches of Pharmacology, Drug Nomenclature and Pharmacopoeias
F2-Ph-002	Sources of Drug, and Active Principles	Identify the Sources & Active Principles of Drugs with Clinical Applications of Active Principles Describe different sources of drugs. Tabulate differences between fixed oils and volatile oils as sources of drugs.
F2-Ph-003	Parameters	Summarize definitions of various pharmacokinetic and pharmacodynamic parameters
F2-Ph-004	Route of Administration	Name various routes of drug administration. Discuss the advantages & disadvantages of various routes of drug administration Describe the factors that influence the route of administration of a drug. Understand the Clinical Relevance of the Selection of Routes of Administration
F2-Ph-005	Permeation	Enlist the different processes by which drugs are transported across cell membranes. Describe and differentiate each transport process.
F2-Ph-006	Absorption	Describe Drug Absorption Describe drug-based factors affecting rate and extent of drug absorption. 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 Hasselbalch equation. Determine percentage of drug ionized or unionized when placed in a certain Ph media Explain ion trapping. Describe patient-based factors affecting rate and extent of drug absorption. Describe the Clinical Significance of Drug Absorption
F2-Ph-007	Bioavailability First Pass Effect	Define Bioavailability. Describe factors affecting bioavailability Define Area under the curve (AUC). Explain first pass elimination Explain extraction ratio. Understand that how bioavailability and the first pass effect, affect the different Clinical conditions. Explain bioequivalence and therapeutic equivalence
F2-Ph-008	Distribution	Define Drug Distribution Describe the distribution of a drug through various body compartments. Explain selective distribution. Describe factors affecting distribution of a drug. Explain volume of distribution (Vd) and how to calculate Vd. understand

		the clinical significance of Vd Explain the characteristics of a drug that is bound to plasma proteins. Describe the clinical consequences of displacement of a drug from plasm protein binding.
F2-Ph-009	Metabolism and bio-transformation	Explain metabolism and biotransformation. Describe the aims and outcomes of metabolism and biotransformation Explain a 'prodrug' Enlist and describe characteristics of Phase 1 and Phase 2 reactions of biotransformation Describe microsomal and non-microsomal biotransformation reactions Describe the microsomal oxidation system Explain Hoffman's elimination Describe factors affecting metabolism & biotransformation. Describe the clinical significance of enzyme induction and enzyme inhibition with their examples. Describe the clinical significance of metabolism & biotransformation. Describe clinical significance of enterohepatic recycling of drugs
F2-Ph-0010	Elimination	Define Plasma Half-Life, and Understand the concept of plasma half-life. Describe factors affecting half-life and clinical significance of plasma half-life. Understand the concept of drug clearance. Describe factors affecting drug clearance. Explain the Clinical Significance of different values of Drug Clearance. Explain steady state plasma concentration. Explain Clinical Significance of Steady State plasma concentration. Define & Explain Elimination and Orders of Elimination – First & Zero Order Kinetics with examples. Describe Clinical Significance of First & Zero Order Kinetics Tabulate differences between First order kinetics and Zero Order Kinetics. Define, explain & calculate maintenance dose and loading dose using appropriate formula
F2-Ph-0011	Excretion	Describe drug excretion. Enlist routes of drug excretion. Describe processes of drug excretion through the kidneys. Describe factors affecting glomerular filtration & tubular reabsorption. Describe the Clinical Significance of Glomerular Filtration, Active Tubular Secretion and Passive Tubular Reabsorption of Drugs
GENERAL PATHOLOGY		
F2-Pa-001	Genetics	Define mutation and classify different types Describe the features and examples of the following i. Autosomal dominant disorders ii. Autosomal recessive disorders iii. X-linked disorders Give brief account of steps of PCR and types of PCR
F2-Pa-002	Genetic Syndromes	Give brief account of; Marfan syndrome Ehlers-Danlos syndrome Down syndrome Klinefelter syndrome Turner syndrome Define karyotyping and enlist the karyotyping of above-mentioned syndromes

F2-Pa-003	Comparison of Gram Positive and negative Bacterial cell wall structure, how bacteria differ from viruses	To know the difference between gram positive and negative cell wall. How it affects the choice of antibiotic
General Microbiology		
F2-Pa-004	Microbiology	Classify gram-positive and negative cocci. Classify gram +ve and gram –ve rods. Classify spirochetes and atypical bacteria. Classify culture media and describe blood, chocolate, McConkey, nutrient, CLED, TCBS, TSI, citrate & urease media. Blood culture. seaboard agar. Define conjugation, transduction, transformation and describe mechanisms of antimicrobial resistance. Define colonization resistance and enlist normal flora of skin, gut, respiratory tract, and vagina. Classify DNA viruses and RNA viruses. Classify medical mycoses fungi. Classify medically important parasites.
Forensic Medicine		
F2-Por-001	Introduction to the Subject of Forensic Medicine	Describe Forensic Medicine & its various branches.
F2-Por-002	Chain of Evidence	Describe evidence, its types & recording of evidence
F2-Por-003	Introduction to Thanatology	Describe the importance of diagnosis of death
F2-Por-004	Death Certificate	Describe the WHO format of the death certificate.
Community Medicine		
F2-CM-001	Concept & Health Disease	Define Health. What are health dimensions? What are the good health indicators Calculate and interpret health indicators of public health importance
Patient Safety		
F2-PS-001	What is patient safety	Explain why patient safety is a critical concern in healthcare and how it impacts the quality of patient care.
F2-PS-002	Applying human factors is important for patient safety	Students should understand the relationship between human factors and patient safety
General Surgery		
F2-S-001	Wound Management	Describe the basics of Wound Healing & tissue repair
F2-S-002	Burns	Classify Burns & its management
F2-S-003	Shock &	Identify hemorrhage & shock in Trauma patient.

	Hemorrhage	
General Medicine		
F2-M-001	Bacterial Diseases	Signs, symptoms, and differentials of common bacterial diseases.
F2-M-002	Viral Diseases	Signs, symptoms, and differentials of common viral diseases.
Psychiatry		
F2-BhS-001	Introduction to Health Behavior and Its Determinants	Define health behavior and discuss the importance of behavioral sciences in medical practice. Identify biological, psychological, and social factors that influence health behaviors and decision- making. Discuss key behavioral change models (e.g., Health Belief Model, Theory of Planned Behavior) and their application in patient care
Practical / Lab Work		
Forensic Medicine		
F2-For-009	Trace Evidence	Describe trace evidence & its types
F2-For-010	Dactylography Recording of evidence	Types of fingerprints Recording of dying declaration
F2-For-011	Consent form	Take written informed consent for various procedures
Pathology		
F2-Pa-005	Use of Microscope & Gram staining	To perform steps of gram staining. How this staining will help to choose antibiotics.
Pharmacology		
F2-Ph-012	Calculation	Calculations of drug dosing (e.g., IV infusion) & dose of children.
F2-Ph-013	Drug Dosing	Calculations (Mean, Mode, Median, Standard Deviation, and Standard Error), and Metrology.
Surgery		
F2-S-004	Basic Surgical Skills	Enlist Suture types & techniques
F2-S-005	Wounds Management	Classify Wound Dressings & its protocols
Medicine		
F2-M-003	History Taking	History taking skills
F2-M-004	General Physical Examination	Approach to patient

14. Learning Objectives:

MODULE NO. 13: General & Clinical Pharmacology.

Syllabus:-

Pharmacology		
Code	**Topic**	**Specific Learning Outcomes**
GPh-Ph-001	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, 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, Super infection, 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.
GPh-Ph-002	Autonomic Pharmacology Cholinergic System	List the cholinergic receptors and recall their site of action and 2nd messenger system. Classify cholinergic agonists and antagonists. Discuss the pharmacological actions / systemic effects of cholinergic agonists and antagonists. Outline the clinical uses and adverse effects of Cholinomimetics. Differentiate between myasthenia crisis and cholinergic crisis. Give the outline of the management of Myasthenia gravis. Role of pharmacology in Alzheimer's disease. Role of Pharmacology in treatment of Glaucoma Discuss the management of Organophosphate (OPC) poisoning Describe the process of "aging" in OPC poisoning and its management Discuss the Therapeutic Uses of Anti-muscarinics 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
GPh-Ph-003	Autonomic	Enlist the adrenergic receptors and recall their site of action and 2nd

	Pharmacology (Adrenergic System)	messenger system. Classify adrenergic agonists Recall the general characteristics of catecholamines. Compare the structural characteristics of catecholamines & non catecholamines 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 failure
Biochemistry		
GPh-B- 001	Signal Transduction & Second Messengers	Describe the features of Signal transduction. Describe different types of second messengers Differentiate the G protein and non-G protein mediated
Physiology		
GPh-P- 001	Autonomic nervous System	Describe the types of adrenergic and cholinergic receptors and their functions. Explain the effects of sympathetic and parasympathetic on various organs/systems of the body
Behavioral Sciences		
GPh-P- 001	Ethical dilemmas	Describe common ethical dilemmas in drug trials & pharmaceutical industry.
Practical's / Lab Work		
Pharmacology		
GPh-Ph-004	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 % $KMnO_4$ 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%
GPh-Ph-004	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		
GPh-PS-001	Learning from errors to prevent harm	Understanding of the terms error, slip, lapse, mistake, violation, near miss and hindsight bias
GPh-PS-002	Medication safety	Learn and practice ways to improve the safety of medication use.

15.Learning Objectives:

MODULE NO: - 14: HEMATOPOIETIC IMMUNITY & TRANSPLANT

syllabus: -

HEMATOLOGY		
CODE	**TOPIC**	**Learning Outcomes**
HIT-H-001	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 B_9 and B_{12}. Give biochemical explanation for microcytic anemia in subjects suffering from deficiency of vitamin B_6, vitamin B_2, 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. 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 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 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). Explain how electrophoresis helps in confirming the diagnosis of various types of qualitative hemoglobinopathies (HbS, HbC, HbSC).

		Enlist the inherited and acquired causes of methemoglobinemia's and elaborate the consequences. Describe and interpret the data inheritance, clinical features, lab diagnosis of Von Willebrand's disease, Hemophilia A&B and Polycythemia Give explanation for hemorrhages in subjects suffering from vitamin K and vitamin C deficiency. Elaborate mechanisms which can cause neutropenia/agranulocytosis Explain how deficiency of glucose-6-phosphate translocase results in neutropenia and recurrent infections.
HIT-H-002	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. Explain the pathophysiology of gastric lymphomas including the type (eg. MALT and diffuse large B-cell lymphoma), role of H. pylori infection Identify the clinical features and diagnostic modalities (eg. Endoscopy, biopsy and imaging) and differential diagnosis of gastric lymphomas inpatients presenting with gastrointestinal symptoms
HIT-H-003	Haemopoietic System	Explain and interpret the data of acute and chronic leukemias with respect to classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis 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 aetiology, pathogenesis, morphology, clinical features, diagnosis, staging and prognosis Explain and interpret the data of disseminated intravascular coagulation with respect to classification, aetiology, pathogenesis, morphology, clinical features, diagnosis, prognosis and management. 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. 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. Interpretation of coagulation profile in the assessment of bleeding disorders

		Describe the clinical manifestations, clinically differentiating features of patients with bleeding tendency List the drugs used to treat bleeding disorders
HIT-H-004	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 Enlist changes that take place in the biochemical composition of stored blood. Give significance of rejuvenation.

General Pathology

CODE	TOPIC	Learning Outcomes
HIT-Pa-001	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 Understand the types and apply the knowledge in clinical aspects of antibodies
HIT-Pa-002	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.
HIT-Pa-003	Immunology	Understand the clinical aspects of hypersensitivity reactions and interpret the data related to these conditions (infectious diseases and autoimmune disease)
HIT-Pa-004	Transplantation	Describe types of transplant rejection & Graft vs Host disease and apply the knowledge in different clinical scenarios 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 Describe clinical aspects of auto immunity and autoimmune disease and apply the knowledge in different clinical settings

HEMATOLOGY, PATHOLOGY LABORATORY

CODE	TOPIC	Learning Outcomes
HIT-H-005	Hematopoietic and Lymphoid System	Perform CBC on analyzer and interpret the report
HIT-H-006	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
HIT-Pa-005	Immunology	Interpret the data of ELISA for different tests related to immunology.
HIT-Pa-006	Transplant	Interpret the data of Graft rejection, Graft versus host disease.

Clinical Rotations / Community Health Care		
HIT-H-007	Blood Transfusion	Administer Blood Products x3 Clinical Audit for indications and transfusion reactions x3

16. Learning Objectives:

MODULE NO: - 15: Forensic Medicine & Toxicology

syllabus: -

THANATOLOGY		
CODE	**TOPIC**	**Learning Outcomes**
For-Th-001	Death and Life	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
For-Th-002	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 adiopocere formation
For-Th-003	Bio chemical changes, after death	Summarize the biochemical changes in blood, vitreous humour and CSF after death
For-Th-004	Estimation of Post-mortem interval	List of different parameters to determine PMI. Describe rate method and concurrent methods to estimate PMI.
For-Th-005	Sudden death	Define sudden death Summarize common causes of sudden death
For-Th-006	Mechanism, manner, cause, modes of death,	Differentiate between modes, manner cause and mechanism of death.
For-Th-007	Post-mortem artefacts	Define and classify post mortem artefacts Explain medico legal significance of artefacts.
For-Th-008	Flow- cytometry	Discuss the use of flow-cytometry in forensic medicine.
For-Th-009	Sudden infant death syndrome (SIDS)	Define sudden infant death syndrome Explain causes of sudden infant death syndrome and its pathological findings

AUTOPSY

CODE	TOPIC	Learning Outcomes
For-Au-001	Autopsy, Its types and objectives	Define autopsy Summarize types of autopsies Compare the differences of medical and medico legal autopsy. Enlist objectives of autopsy Enlist Essentials of autopsy
For-Au-002	Global systems of death investigations	Compare and contrast four death investigation systems i. Coroner s system, ii. Medical examiner system, iii. Continental system, Procurator fiscal system in Scotland
For-Au-003	Autopsy Protocol	Define autopsy protocol. Preliminary documents required for i. autopsy, ii. Bio data. iii. Identification iv. External examination v. Internal examination vi. Conclusion. vii. Documentation. Differentiate between narrative and numerical autopsy protocol.

For-Au-004	Autopsy incisions	Describe primary autopsy incisions, secondary autopsy incisions and tertiary autopsy incisions Explain autopsy incisions to dissect neck, heart, brain, spinal cord, limb and bone marrow Explain incisions to reveal pneumothorax, DVT, Fat embolism and pulmonary embolism
For-Au-005	Autopsy techniques	Describe 4 autopsy techniques- Letulle Ghon, Virchow and Rokitansky
For-Au-006	Collection of viscera at autopsy	Describe the viscera with quantity to be taken for toxicological analysis Describe the viscera with quantity to be taken for histopathological analysis. Explain preservatives used for autopsy samples. Demonstrate the preservation of different viscera to be sent to analyst. Explain the autopsy protocol for collection/recovery, preservation, labelling and dispatch of biological and non-biological material
For-Au-007	Essential of autopsy suite	Describe standard autopsy suite Summarize the requirements of autopsy room
For-Au-008	Hazards of autopsy	Summarize the hazards of autopsy
For-Au-009	Negative autopsy	Define Negative autopsy Explain the causes of negative autopsy
For-Au-010	Exhumation	Define exhumation Enlist the objectives of exhumation Explain the procedure of exhumation Enlist the specimens collected in exhumation Enlist the limitations of exhumation Summarize the precautions during exhumation
For-Au-011	Examination of fragmentary / Mutilated / Skeletal remains	Summarize the objectives of autopsy on mutilated dead body/fragmentary remains

PERSONAL IDENTITY

CODE	TOPIC	Learning Outcomes
For-PI- 001	Personal Identity	Define Personal Identity Describe types of personal identity List the purpose of identification in Living & dead Briefly describe the parameters of Personal Identity in living and dead Describe different methods of determining personal identity Enumerate surest methods to determine personal identity for identification Enlist the ages of medico-legal importance for civil & criminal responsibility

For-PI- 002	Age determination	Determine the age of a living person for medico-legal purpose Determine the age of a fetus regarding its length, weight & morphological features Determine the age of an examinee from appearance & union of ossification centres of different bone Identify the sequence of appearance of ossification activity in intrauterine life. Relate the medico-legal importance of bones in the identification
For-PI- 003	Sex determination	Determine the sex of an individual by carrying out anatomical, chromosomal investigations Diagnose the disorders of sexual development Describe the Medico Legal Importance of Sex determination Enlist limitations of sex determination in Dead
For-PI- 004	Forensic Odontology	Describe the process of estimation of age from primary, secondary & mixed dentition Describe different methods for age estimation from odontology Enlist the information obtained from dental examination Relate medico legal importance of identification with odontology
For-PI- 005	Race determination	Determine Race of a person from different parameters
For-PI- 006	Stature estimation	Determine stature of a person by different methods.
For-PI- 007	Anthropometry	Describe anthropometry with reference to age Determination
For-PI- 008	Dactylography	Classify fingerprint patterns according to Galton's classification. Explain different methods of recording fingerprints. Describe the advantages & medico legal importance of Dactylography Define Poroscopy / Locards method
For-PI- 009	DNA Profiling	Describe the role of DNA Fingerprinting in identification. Enlist the samples required for DNA profiling in medicolegal cases Enumerate the medicolegal importance of DNA fingerprinting
For-PI- 010	Mass Disaster Identification	Identify different methods of identification in case of mutilated, burnt and decomposed dead bodies Apply the international SOP of disaster Victim Identification (DVI) in mass disaster
Practical / Lab Work		
THANATOLOGY		
CODE	**TOPIC**	**Learning Outcomes**

For-Th- 010	Autopsy	Demonstrate the immediate, early and late changes after death in a corpse. Calculate time since death on the basis of findings noted in the corpse
For-Th- 011	WHO guidelines of death certificate	Prepare a death certificate of cause of death according to WHO guidelines
AUTOPSY		
CODE	**TOPIC**	**Learning Outcomes**
For-Au- 012	Autopsy report	Demonstrate correct report writing
For-Au- 013	autopsy	Observe the procedure of autopsy examination and dissection
For-Au- 014	Biological material	Demonstrate the correct method of preservation and dispatch of specimens for histo- pathological and toxicological analysis
PERSONAL IDENTITY		
CODE	**TOPIC**	**Learning Outcomes**
For-PI- 011	Personal identification	Identify the person for different medico-legal cases (age determination, sex determination) Take fingerprints by plain and rolling method and classify according to Galton's Classification Estimate & certify the age of a person for medico-legal Purposes
For-PI- 012	Bite marks analysis	Identify the bite marks and perform their analysis
For-PI- 013	Age & sex determination	Estimate the age of the person from the oral examination of the teeth Interpret the findings from x-rays of bones for appearance and union of ossification centres for age determination Identify the sex and age from morphological features of different bones

17. ASSESSMENT METHODS.

Tools & Policy

Tools for Formative and Summative Assessments:-

- **Written examination:-**
  - MCQ's
  - SEQ's
  - OSPE
  - Viva Voce
  - Assignments

Assessment Policy:-

- **Eligibility Criteria for Appearing in UHS Annual Examination.**
  - Minimum 85% attendance (in each Block and in aggregate)
  - Minimum 50% aggregate Marks all Test
- **Retake of institutional block examination/ s will be allowed only under Special Circumstances**
- Candidates falling short of attendance requirement shall not be admitted to the annual examination but may be permitted to appear at the supplementary examination if they make up the deficiency up to the commencement of next examination by remaining on rolls of a college as regular student, subject to fulfillment of all other mandatory requirements to appear at the examination
- College may arrange remedial classes and one re-sit for each block examination, either with the subsequent block examination or before completion of the subsequent block, and before or during preparatory leave in case of terminal block of the professional year, before issuance of date sheet for the concerned professional examination.
- The students can appear in Re-sit of a block examination, along with the subsequent block, and before or during preparatory leave for the terminal block of the professional year, once the requirement of attendance is met with. However, conduct of remedial classes shall be permitted only in the cases of students, who shall have attended at least 50% of the total attendance of the concerned block in the first instance.
- The valid reason for short attendance in block or absence from a block examination may include major illness/ accident/ surgery of the student or death of an immediate relative, being afflicted by nature calamity or disaster.

18. Distribution and Duration of Teaching Activities

Foundation-II & EBM

- Pharmacology:
- Pathology:
- Community Medicine:
- Forensic Medicine:
- Patient Safety:
- Surgery:
- Medicine
- Psychiatry

Sr. No	Subject	Lectures	Practical / Tutorial	C-FRC	Grand Total
1	Pathology	15	02		17
2	General Pharmacology	17	03		20
3	Community Medicine	03	--		03
4	Forensic Medicine	02	04		06
5	Patient Safety	04	--		04
6	Surgery	03	--	02	05
7	Medicine	02		02	04
8	Psychiatry	02	--		02

Note:***All other departments should integrate with Pharmacology Department.

General & Clinical Pharmacology

- Pharmacology & Therapeutics
- Biochemistry
- Physiology
- Behavioral Sciences
- General Medicine

Sr. No	Subject	Lectures	Practical / Tutorial	C-FRC	Grand Total
1	Pathology	--	--		--
2	General Pharmacology	58	12		70
3	Community Medicine	--	--		--
4	Forensic Medicine	--	--		--
5	Patient Safety	03	--		03
6	Surgery	--	--		--
7	Medicine	--	--		--
8	Psychiatry Behavioral Sciences	02	--		02
	Biochemistry	02	--		02
	Physiology	02	--		02

Note: ***All other departments should integrate with Pharmacology Department

HEMATOPOIETIC IMMUNITY & TRANSPLANT

- Pharmacology & Therapeutics
- Biochemistry
- Physiology
- Behavioral Sciences
- General Medicine

Sr. No	Subject	Lectures	Practical / Tutorial	C-FRC	Grand Total
1	Pathology	49	15	06	70
2	General Pharmacology	--	--		
3	Community Medicine	--	--		
4	Forensic Medicine	--	--		
5	Patient Safety	--	--		

6	Surgery	--	--		
7	Medicine	--	--		
8	Psychiatry Behavioral Sciences	--	--		
	Biochemistry	--	--		
	Physiology	--	--		

Note:***All other departments should integrate with Pathology Department

Forensic Medicine & Toxicology

- Pharmacology & Therapeutics
- Biochemistry
- Physiology
- Behavioral Sciences
- General Medicine

Sr. No	Subject	Lectures	Practical / Tutorial	C-FRC	Grand Total
1	Pathology	--	--		--
2	General Pharmacology	--	--		--
3	Community Medicine	--	--		--
4	Forensic Medicine	16	16		32
5	Patient Safety	--	--		--
6	Surgery	--	--		--
7	Medicine	--	--		--
8	Psychiatry Behavioral Sciences	--	--		--
	Biochemistry	--	--		--
	Physiology	--	--		--

Note:***All other departments should integrate with Forensic Medicine Department

19. *Teaching Hours Block -07 (UHS)*

Pharmacology & Therapeutics

UHS Recommendation for Teaching Hours			
Block -07	Hours	Module Weeks	Minimum Recommended hours
Module 12 Foundation-II & EBM	Theory 48 hours Practical 13 hours	1.74 Weeks	62
Module 13 General & Clinical Pharmacology	Theory 64 Hours Practical 12	2.25	79
Module 14 Hematopoietic, Immunity & Transplant	Integrate with Pathology		
Module 15 Forensic Medicine & Toxicology	Integrate with Forensic Medicine		

20. TIME TABLE Block -07

3rd YEAR M.B.B.S RAMAZAN TIMETABLE SESSION 2022-2023 w.e.f. 24-03-2025 (MODULE 12 & 13) 4 WEEKS

DAYS & TIME	08:00 a.m. to 08:45 a.m.	08:45 a.m. to 09:00 a.m.	*09:00 a.m. to 10:30 a.m.	10:30a.m. to 10:45 a.m.	**10:45 a.m. to 11:45 a.m.		11:45 a.m. to 12:30 p.m.	12:30 p.m. to 01:15 p.m.	01:15 p.m. to 02:00 p.m.
MONDAY	Pathology Lecture Theatre No. 11	**Travel to GTTH**	**WARD/SDL**	**Travel To LMDC**	Pharmacology ***Forensic Medicine/ Pathology C-FRC Clinical Pharma	A+B C+D E+FG +H	Pharmacology Lecture Theatre No. 11	Pathology Lecture Theatre No. 11	Pharmacology Lecture Theatre No. 11
TUESDAY	Pharmacology Lecture Theatre No. 11				Pharmacology ***Forensic Medicine/ Pathology C-FRC Clinical Pharma	G+H A+B C+DE +F	Forensic Medicine Lecture Theatre No. 11	Pharmacology Lecture Theatre No. 11	Pathology Lecture Theatre No. 11
WEDNESDAY	Pharmacology Lecture Theatre No. 11				Pharmacology ***Forensic Medicine/ Pathology C-FRC Clinical Pharma	E+F G+H A+B C+D	Pathology Lecture Theatre No. 11	****Patient Safety/Psychiatry Lecture Theatre No. 11	Pharmacology Lecture Theatre No. 11
THURSDAY	Pharmacology Lecture Theatre No. 11				Pharmacology ***Forensic Medicine/ Pathology C-FRC Clinical Pharma	C+D E+F G+H A+B	*****Behavioral Science/Community Medicine Lecture Theatre No. 11	Pharmacology Lecture Theatre No. 11	Pathology Lecture Theatre No. 11
			09:30 a.m. to 10:45 a.m.		**10:45 a.m. to 11:30 a.m.**			**11:30 a.m. to 12:15 p.m.**	**12:15 a.m. to 01:00 p.m.**
FRIDAY	Pharmacology Lecture Theatre No. 11	Surgery Lecture Theatre No. 11	**GRAND TUTORIAL** Pharmacology Forensic Medicine Pathology Clinical Pharma		PERL Lecture Theatre No. 11			******Medicine/ Community Medicine Lecture Theatre No. 11	*******Pharmacology/ Integrate with Physiology/Biochemistry Lecture Theatre No. 11

21. TOS for Block -07 Examination:-

Subject	Written Examination			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 + ExposlTory	-	-	-	-	01	-	10
Total	**90**	**10x5=50**	**140**	**11 stations x 08 = 88**	**01 stations x 10 = 10**	**03 stations x 14=42**	**140**

TOS for Block -07 Examination:-

<table>
<tr><th>Subject</th><th colspan="2">Theory</th><th colspan="3">Practical / OSPE</th><th>Total</th></tr>
<tr><td rowspan="4">Modules
(Foundation-II + Hematopoietic, Immunity & Implant + General & Clinical Pharmacology + Forensic Medicine & Toxicology-I)</td><td>Part I MCQs (90)</td><td>90 Marks</td><td rowspan="2">Practical
/Clinical Examination</td><td rowspan="2">11 OSPE
01 OSCE
03 OSVE</td><td rowspan="2">Marks
88
10
42</td><td rowspan="2">350 Marks</td></tr>
<tr><td>Part II SEQS (10)</td><td>50 Marks</td></tr>
<tr><td>Internal Assessment
10%</td><td>35 Marks</td><td>Internal Assessment
10%</td><td colspan="3">35 Marks</td></tr>
<tr><td>Total</td><td>175</td><td>Total</td><td colspan="3">175</td></tr>
</table>

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

The examination in Block 7 shall be as follows: -

One written paper of 140 marks having two parts:

- 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.
- 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.

I. "Oral/Practical/Clinical" examination shall have 140 marks in total.
II. 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.

22. C-FRC PHARMACOLOGY

C-FRC is a spiral which ensures the psychomotor skill development. The framework provides as a basis for skill development relevant to different study modules and ward rotations. All the psychomotor and affective skill development has also been mentioned in the module's sections of the Curriculum 2023

Considering the institutional diversity in terms of the student strength, resources and clinical rotation schedules, the C-FRC module and logbook can be adopted and implemented by every affiliated institution with an adaptive approach.

The logbook of C-FRC has been categorized in sections to establish relevance with the modules as well as the ward rotations independent of the module. This division can provide diverse learning opportunities for the students.

Comprehensiveness of training based on the provided framework will be enhanced by the respective institutional learning opportunities, ward rotation plans, tangible resources, timetables, skill labs, manikins, laboratory setups and virtual learning platforms.

The spiral of the C-FRC has the core concept that the student's skill acquisition should be aligned for better outcomes as they proceed to the clerkship year. The utilization of the allotted hours by PMDC and UHS should be utilized in an effective manner, maximizing the utility of the available resources. It is suggested that the **Academic Council** along with the **Department of Medical Education** should discuss and document the following:

- Institutional 'Clinics rotation plan'.
- Community rotations schedule
- Family Medicine rotations
- **EOR-assessment** ('end-of-rotation assessment') framework with block wise vs batch wise details.
- **EOR-assessment** methodologies (as mentioned in the following section) to be adopted. Planner for timely internal assessment submission

Based on the decisions made by the college academic council, the Departments of Medical Institution can develop their own respective rotation plans keeping in view the sections and coding. The Principal/DMEs will ensure the following principles while developing the rotational plans:

- Third year students will have laboratory, community and clinical rotations to maximize all the learning content mentioned in the main Curriculum 2K23 version 3.0 as well as the C-FRC logbook.

- At least one third of the logbook entries must be completed for each block to secure marks in the internal assessment.
- DMEs will manage, monitor and document clinical assessments conducted as EOR- assessment ('end-of-rotation assessment').
- The EOR-assessments can comprise of at least two of the following workplace-based methods.
    - OSCE
    - Case-based discussion
    - Clinical Viva
    - Clinical encounter cards
- The EOR-assessment plan will be developed and submitted to the examination department UHS with the students' scores as part of the internal assessment.
- The Prescription Inference Cards will be a part of the log-book entries.
- At least two Prescription Inference Cards per block will be a part of the log entries
- The marks obtained by the students will be based on the log-book entries, and the Prescription Inference Cards
- Principal/DME will ensure that in addition to securing marks in the internal assessment the ward assessments are a college's internal criteria for proceeding to the block examination.
- Principal/DME will ensure that all the sections have been filled out before final submission to the University for the professional Examination.
- Before signing the log book entry, the DME/HOD will ensure that the skill/task has been achieved by the student.

C-FRC Schedule Block -07

C-FRC Code	Task/Skill	Discipline	Module	Signature DME/HOD
CFRC3-001	Prescribing anti- hypertensive	All rotations/Pharmacology Lab/Skills Lab	**Pharmacology**	
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, Anti-hypertensive).			
CFRC3-006	Ability to calculate and adjust dosages for common medications based on patient factors.			
CFRC3-007	Perform proper hand hygiene, aseptic techniques, and basic infection control protocols.	All rotations	**Foundation**	
CFRC3-008	Demonstrate appropriate use of PPE and understand its importance in preventing healthcare-associated infections	All rotations /Skill lab		
CFRC3-009	Take detailed patient history and perform general physical exams.	All rotations		
CFRC3-010	Understand fluid compartments and the Basics of electrolyte balance.			
CFRC3-011	Offer guidance on health maintenance, such as hygiene, nutrition, and medication adherence.			
CFRC3-012	Perform and interpret measurements of vital signs (e.g.,BP,pulse, temperature,respiratory rate).		**Hematopoetic**	
CFRC3-013	Recognize abnormal vital signs and escalate care accordingly.			
CFRC3-014	Perform basic blood sampling (e.g., venipuncture) with proper aseptic technique			
CFRC3-015	Order common hematologic tests (e.g., CBC, blood typing, coagulation profile).			
CFRC3-016	Interpret basic hematologic lab results, including CBC parameters platelets). (e.g., hemoglobin,WBC count,			