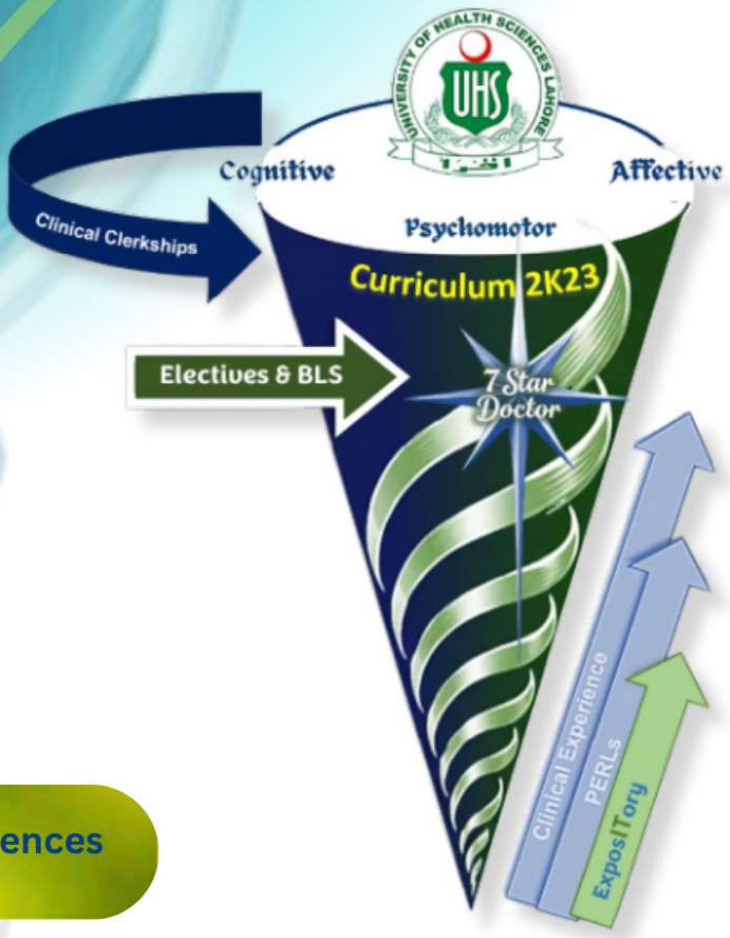
MBBS YEAR 03

Volume-03

Modular Integrated Curriculum 2K23

Final Version



University of Health Sciences Lahore

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Modular Integrated Curriculum 2K23

Volume-03 / Year-03

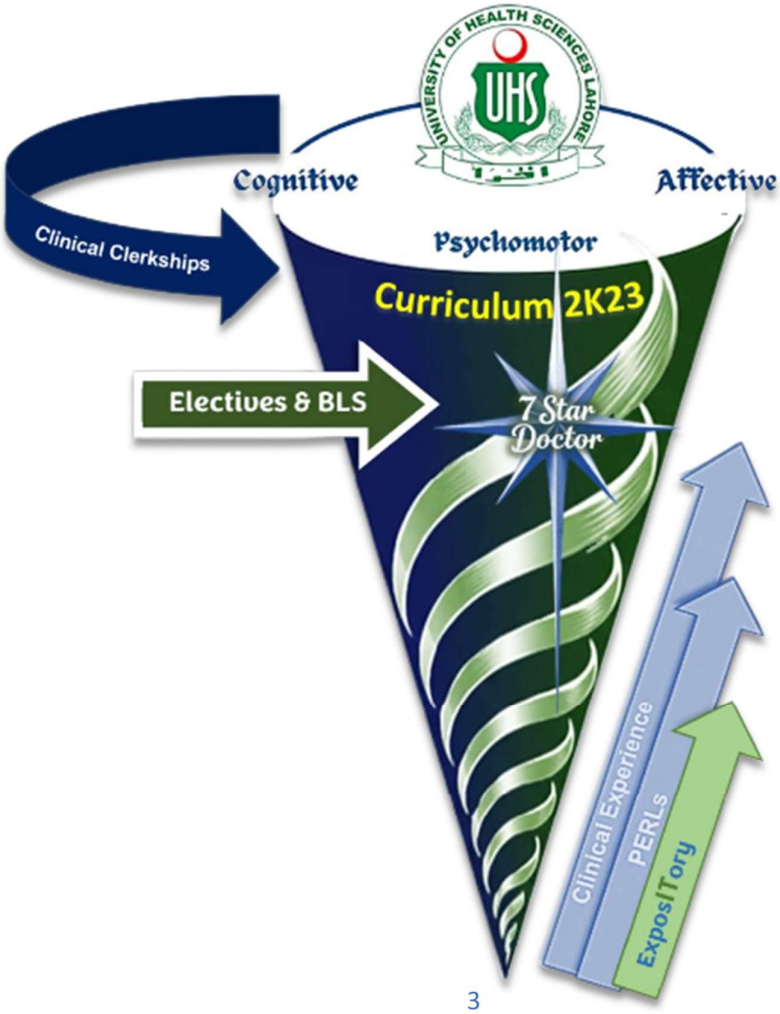


Table of Contents

Table of Contents

Section	Content	Page No.
1	Curriculum Framework	7
2	**Year-3 Modules**	10
	Block-7	11
	12) Foundation-II & EBM	12
	13) General & Clinical Pharmacology	27
	14) Hematopoetic, Immunity & Transplant	38
	15) Forensic Medicine & Toxicology-I	54
	Block-8	66
	16) Neoplasia	67
	17) Infectious Diseases	81
	18) Musculoskeletal & Locomotion-II	108
	19) Forensic Medicine & Toxicology-II	130
	Block-9	144
	20) Cardiovascuar-II	145
	21) Respiratory-II	162
	22) Community Medicine & Family Health-I	129
	23) Forensic Medicine & Toxicology-III	197
3	Table of Specifications	224
4	C-FRC-III	229
5	PERLs-III	258
6	Expository-III	300
7	Student Portfolio-III	307
8	Skill Acquisition Workshops	354

01

Section

Curriculum Framework

Modular Integrated Curriculum 2K23 Framework

YEAR-1

MODULES

BLOCK-I
- FOUNDATION-I
- HEMATOPOIETIC & LYMPHATIC

BLOCK-II
- MUSCULOSKELETAL & LOCOMOTION-I

BLOCK-III
- CARDIOVASCULAR-I
- RESPIRATORY-I

QURAN-1
PERLS-1
EXPOSITORY-1
ISLAMIYAT / CIVICS
PAKISTAN STUDIES
C-FRC 1 (CLINICAL-FOUNDATION, ROTATION, CLERKSHIPS)

YEAR-2

MODULES

BLOCK-IV
- GIT & NUTRITION-I
- RENAL-I

BLOCK-V
- ENDOCRINOLOGY & REPRODUCTION-I
- HEAD & NECK, SPECIAL SENSES

BLOCK-VI
- NEUROSCIENCES-I
- INFLAMMATION

QURAN-2
PERLS-2
EXPOSITORY-2
ISLAMIYAT / CIVICS
PAKISTAN STUDIES
C-FRC 2 (CLINICAL-FOUNDATION, ROTATION, CLERKSHIPS)

YEAR-3

MODULES

BLOCK-VII
- FOUNDATION-2 & EBM
- GENERAL & CLINICAL PHARMACOLOGY
- HEMATOPOIETIC & IMMUNITY & TRANSPLANT
- FORENSIC MEDICINE & TOXICOLOGY-I
- NEOPLASIA

BLOCK-VIII
- INFECTIOUS DISEASE
- MUSCULOSKELETAL & LOCOMOTION-II
- FORENSIC MEDICINE & TOXICOLOGY-II

BLOCK-IX
- CARDIOVASCULAR-II
- RESPIRATORY-II
- COMMUNITY MEDICINE & FAMILY HEALTH-I
- FORENSIC MEDICINE & TOXICOLOGY-III

PERLS-3
EXPOSITORY-3
C-FRC 3 (CLINICAL-FOUNDATION, ROTATION, CLERKSHIPS)

YEAR-4

MODULES

BLOCK-X
- COMMUNITY MEDICINE & FAMILY HEALTH-II
- GIT & NUTRITION-II
- EYE & ENT-I

BLOCK-XI
- NEUROSCIENCES-II
- PSYCHIATRY & BEHAVIORAL SCIENCES
- RENAL-II
- EYE & ENT-II

BLOCK-XII
- ENDOCRINOLOGY & REPRODUCTION-II
- DERMATOLOGY
- EYE & ENT-III

BLS WORKSHOPS
ELECTIVES
PERLS-4
EXPOSITORY-4
C-FRC 4 (CLINICAL-FOUNDATION, ROTATION, CLERKSHIPS)

YEAR-5

CLERKSHIPS

- SURGERY
- GYNECOLOGY & OBSTETRICS
- MEDICINE
- PEDIATRICS

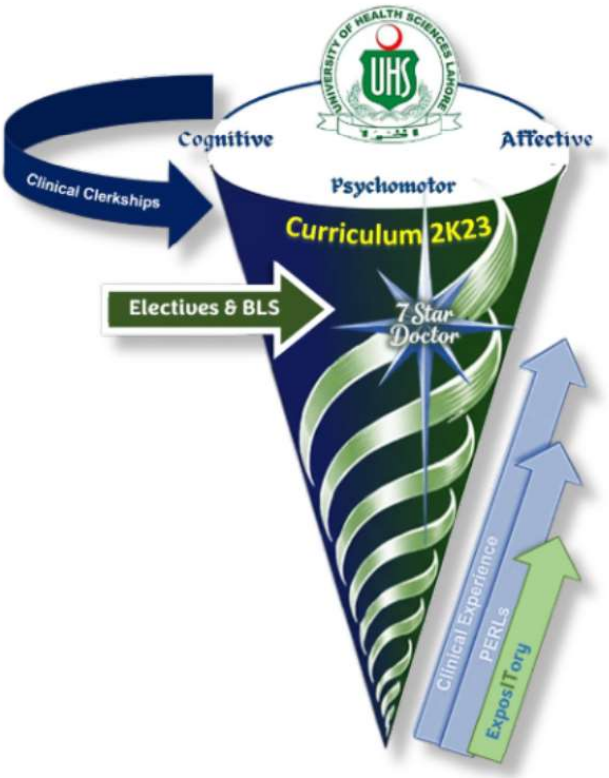
C-FRC 5 (CLINICAL-FOUNDATION, ROTATION, CLERKSHIPS)

02
Section

Modular Integrated Curriculum 2K23

MBBS Year-03

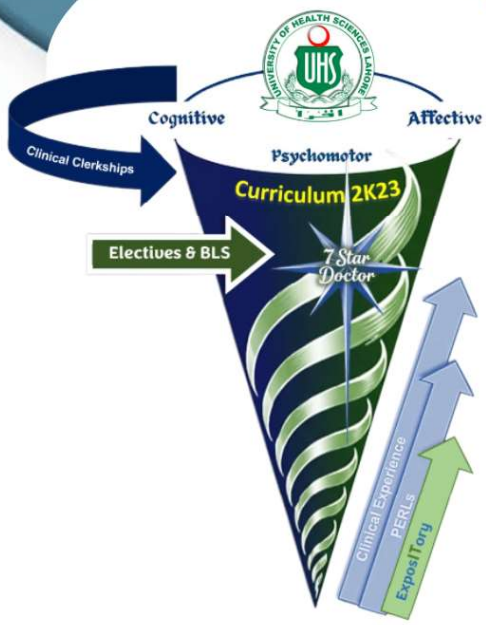
YEAR-3



Modular Integrated Curriculum 2K23

MBBS Year-03

BLOCK-7



Modular Integrated Curriculum 2K23

Volume-03

MODULE 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.

SUBJECTS INTEGRATED IN THE MODULE

1. Pathology
2. General pharmacology
3. Community medicine
4. Forensic Medicine
5. Patient Safety
6. Surgery
7. Medicine
8. Psychiatry

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

GENERAL PHARMACOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 17	
		INTEGRATING DISCIPLINE	TOPIC
F2-Ph-001	Define Pharmacology, different branches of pharmacology, drug nomenclature and pharmacopoeias	Pharmacology	Introduction
F2-Ph-002	Identify the sources and active principles of drugs with clinical applications of active principles. Tabulate differences between fixed oils and volatile oils as sources of drugs.		Sources of drugs and active principles
F2-Ph-003	Summarize definitions of various pharmacokinetic and pharmacodynamic parameters.		Parameters
F2-Ph-004	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. Discuss the clinical relevance of the selection of routes of administration.		Routes of Administration
F2-Ph-005	Enlist the different processes by which drugs are transported across cell membranes. Describe and differentiate each transport process.	Pharmacology	Permeation
F2-Ph-006	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.	Pharmacology	Absorption

	Describe patient-based factors affecting rate and extent of drug absorption. Describe the clinical significance of drug absorption.		
F2-Ph-007	Define bioavailability. Describe factors affecting bioavailability. Define area under the curve (AUC). Explain first pass elimination. Explain extraction ratio. Describe how bioavailability and the first pass effect, affect the different clinical conditions. Explain bioequivalence and therapeutic equivalence.	Pharmacology	Bioavailability and first pass effect
F2-Ph-008	Define drug distribution. Describe the distribution of a drug through various body compartments. Describe factors affecting distribution of a drug. Explain volume of distribution (Vd) and how to calculate Vd. Explain 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 plasma protein binding.	Pharmacology	Distribution
F2-Ph-009	Explain metabolism and biotransformation. Describe the 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.	Pharmacology	Metabolism and biotransformati on

	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-010	Define plasma half-life and explain the concept of plasma half-life. Describe factors affecting half-life and clinical significance of plasma half-life. Explain the concept of drug clearance. Describe factors affecting drug clearance. Explain steady state plasma concentration. Explain clinical significance of steady state plasma concentration. Define and 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 and calculate maintenance dose and loading dose using appropriate formula.	Pharmacology	Elimination
F2-Ph-011	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	Pharmacology	Excretion

GENERAL PATHOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06	
		INTEGRATING DISCIPLINE	TOPIC
F2-Pa-001	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 Enlist types and steps of PCR.	Pathology	Genetics
F2-Pa-002	Define karyotyping Describe the salient features and lab diagnosis along with genetic abnormalities in the following syndromes: i. Marfan syndrome ii. Ehlers-Danlos syndrome iii. Down syndrome iv. Klinefelter syndrome v. Turner syndrome	Pathology	Genetic syndromes
F2-Pa-003	Differentiate between Gram positive and Gram negative cell wall. Discuss how it affects the choice of antibiotic.	Pharmacology	Comparison of Gram-positive and negative Bacterial cell wall structure, how bacteria differ from viruses

MICROBIOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 09	
		INTEGRATING DISCIPLINE	TOPIC
F2-Pa-004	Classify gram positive and gram negative cocci. Classify gram positive and gram negative rods. Classify spirochetes and atypical bacteria.	Microbiology	Microbiology

	Classify culture media and describe blood, chocolate, McConkey, nutrient, CLED, TCBS, TSI, citrate & urease media, blood culture and 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

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
F2-For-001	Define forensic medicine and describe its various branches.	Forensic Medicine & Jurisprudence	Introduction to the subject of Forensic Medicine
F2-For-002	Describe evidence, its types & recording of evidence	Jurisprudence	Chain of evidence
F2-For-003	Describe the importance of diagnosis of death		Introduction to Thanatology
F2-For-004	Describe the WHO format of the death certificate.		Death certificate

COMMUNITY MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
F2-CM-001	Define health. Describe health dimensions.	Community medicine	Health dimensions &

	Describe the good health indicators.		Indicators
	Calculate and interpret health indicators of public health importance.		

PATIENT SAFETY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		INTEGRATING DISCIPLINE	TOPIC
F2-PS-001	Explain patient safety as a critical concern in healthcare and its impact on the quality of patient care.	Medicine	Patient safety concept
F2-PS-002	Discuss the relationship between human factors and patient safety.	Surgery	Human factors and patient safety

GENERAL SURGERY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
F2-S-001	Describe the basic stages of surgical wound healing. Differentiate between primary and secondary wound healing.	Surgery	Wound Healing
F2-S-002	Classify burns based on depth and surface area. Outline the principles of initial surgical management of burns.	Surgery	Burns
F2-S-003	Identify clinical signs of external and internal hemorrhage in trauma patients. Describe early features of hypovolemic shock. Outline the initial steps in managing hemorrhage and shock	Surgery	Shock & hemorrhage

GENERAL MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02

		INTEGRATING DISCIPLINE	TOPIC
F2-M-001	Describe the common clinical features of infectious diseases. Explain the differences in clinical presentation between viral and bacterial infections.	Medicine	Bacterial & viral diseases
F2-M-002	Identify warning signs in infections that require urgent referral or intervention. Outline basic principles of management and prevention of infections.		

PSYCHIATRY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
F2-BhS-001	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.	Behavioral sciences	Introduction to Health Behavior and Its Determinants

Practicals

PRACTICAL

FORENSIC MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		INTEGRATING DISCIPLINE	TOPIC
F2-For-005	Describe trace evidence and its types.	Forensic Medicine	Trace evidence
F2-For-006	Describe the types of fingerprints and their medicolegal importance. Demonstrate the method of recording different types of fingerprints.		Dactylography Recording of evidence
	Demonstrate the procedure for recording a dying declaration. Explain its significance in medicolegal practice.		
F2-For-007	Take written informed consent for various procedures.		Consent form

PATHOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
F2-Pa-005	Demonstrate the correct steps of Gram staining on a specimen. Interpret the results of Gram staining to guide antibiotic choice.	Microbiology	Use of Microscope & Gram staining

PHARMACOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
F2-Ph-012	Calculate drug dosing (e.g., IV infusion) and dose in children.	Pharmacology	Drug dosing
	Calculate mean, mode, median, range, standard deviation, standard error, t-test. Interpret metrology and abbreviations.		

Total Weeks	Total Hours
2.5	57

Modular Integrated Curriculum 2K23

Volume-03

MODULE 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 pharmacodynamic 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.

SUBJECTS INTEGRATED IN THE MODULE

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

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

PHARMACOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 58	
		INTEGRATING DISCIPLINE	TOPIC
GCPh-Ph-001	Define pharmacodynamics, affinity, efficacy, potency.	Pharmacology	Pharmacodynamics
	Explain agonists, (partial, inverse, and bias), allosteric modulators with examples.		
	Describe spare receptors with their clinical importance.		
	Elaborate transmembrane signaling pathways.		
	Name the effectors controlled by G-proteins.		
	Describe various drug–antagonism types with examples. Compare and discuss the information derived from Graded and Quantal dose-response curves. Explain the significance of semi-log transformation.		
	Define Median Effective (ED50), Median Toxic (TD50) & Median Lethal Dose (LD50) with clinical relevance.		
	Define therapeutic index and give its clinical importance.		
	Define therapeutic window and explain its clinical importance.		
	Define the following with examples: desensitization, tachyphylaxis, tolerance, resistance, super sensitivity, hypersensitivity, superinfection, iatrogenic effect, and idiosyncrasy.		
	Describe the phenomenon of regulation of receptors.		
	Describe pharmacogenetics with examples.		
	Illustrate various phases of drug development.		
GCPh-Ph-002	List the cholinergic receptors with their site of action and 2nd messenger system.	Pharmacology	Autonomic Pharmacology Cholinergic System
	Classify cholinergic agonists and antagonists.		

	Discuss the pharmacological actions / systemic effects of cholinergic agonists and antagonists.	Pharmacology	
	Outline the clinical uses and adverse effects of cholinomimetics.		
	Differentiate between myasthenic crisis and cholinergic crisis.	Pharmacology	
	Outline the management of Myasthenia gravis.		
	Explain the pharmacological management of Alzheimer's disease.	Pharmacology	
	Describe the process of 'aging' in OPC poisoning and its management. Discuss the management of Organophosphate (OPC) poisoning.	Pharmacology	
	Discuss the therapeutic uses of antimuscarinics.		
	Discuss the role of anticholinergic drugs in the management of Parkinson's disease.		
	Enlist the toxicity and contraindications of atropine along with their rationale.		
	Enlist the toxic effects and pharmacological treatment of nicotine poisoning.		
	Enlist the toxic effects and pharmacological treatment of mushroom poisoning.		
GCPh-Ph-003	Enlist the adrenergic receptors with their site of action and transduction mechanism. Classify adrenergic agonists.	Pharmacology	Autonomic Pharmacology (Adrenergic System)
	Describe 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. Discuss the therapeutic uses, adverse effects, and contraindications of direct-acting adrenergic agonists.	Pharmacology	
	Classify alpha blockers. Discuss the clinical uses and adverse effects of alpha-blockers. Discuss epinephrine reversal. Discuss the adverse effects of alpha-blockers.		
	Classify beta-blockers. Discuss the clinical indications and adverse effects. of using beta antagonists. Enlist their adverse effects.		
	Compare and contrast the characteristics of Reserpine and Guanethidine.		
	Explain the pharmacological actions of ganglion blockers.		
	Discuss the mechanism of action, clinical uses, and adverse effects of centrally acting sympatholytic drugs (clonidine and methyldopa).		

BIOCHEMISTRY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
GCPh-B-001	Describe the features of signal transduction. Describe types of second messengers. Differentiate the G protein and non-G protein mediated signal transduction pathways.	Biochemistry	Signal Transduction & Second Messengers

PHYSIOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02

		INTEGRATING DISCIPLINE	TOPIC
GCPh-P-001	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.	Medical Physiology	Autonomic Nervous System

BEHAVIOURAL SCIENCES

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
GCPh-BhS-001	Describe common ethical dilemmas in drug trials & pharmaceutical industry.	Behavioural sciences	Ethical dilemmas

PATIENT SAFETY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
GCPh-PS-001	Describe the terms error, slip, lapse, mistake, violation, near miss and hindsight bias.	Pharmacology	Learning from errors to prevent harm
GCPh-PS-002	Explain the ways to improve the safety of medication use.		Medication safety

Practicals

PRACTICAL

PHARMACOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 12	
		INTEGRATING DISCIPLINE	TOPIC
GCPh-Ph-004	Identify and describe components of prescription including its format, types, and rationale of prescription.	Pharmacology	Prescription writing & Drug preparation and dispensing
	Write prescription of the following conditions: motion sickness, anaphylactic shock, cardiogenic shock, iron deficiency anemia, and scabies.		
	Prepare and dispense 100 ml of 0.1 % KMnO4 solution using a stock solution.		
	Prepare and dispense 12 g of Sulphur ointment B-P 10%.		
GCPh-Ph-005	Analyze and interpret the pharmacological effects of Drugs (Acetylcholine, Atropine Adrenaline, Propranolol) on animal through online videos / simulations / graphs / practical performance.	Pharmacology	Autonomic Nervous System
	Analyze and interpret different concentrations of acetylcholine on rabbit's ileum through online videos / simulations / graphs / practical performance.		
	Analyze and interpret drug antagonism between acetylcholine and atropine on rabbit's ileum through online videos / simulations / graphs / practical performance.		
	Analyze and interpret drugs (pilocarpine, adrenaline, atropine, homatropine, proparacaine) on rabbit's eye through online videos / simulations / graphs / practical performance.		

Total Weeks	Total Hours
2.5	79

Modular Integrated Curriculum 2K23

Volume-03

MODULE 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 TORs
• 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.

Syllabus

Theory

HEMATOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 39	
		INTEGRATING DISCIPLINE	TOPIC
HIT-H-001	Describe the stages in formation of red blood cells (RBCs), white blood cells (WBCs), platelets.	Hematology	Hematopoietic system
	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		
	Explain the biochemical basis of megaloblastic anemia in vitamin B_9 and B_{12} deficiency.	Hematology	
	Explain the biochemical basis of microcytic anemia in vitamin B_6, vitamin B_2, vitamin C, vitamin A, and iron deficiencies.		
	Explain the biochemical mechanisms of hemolysis in pyruvate kinase and glucose-6-phosphate dehydrogenase deficiencies.		
	Explain the biochemical mechanisms of hemolysis in hereditary spherocytosis and elliptocytosis.		
	Explain the biochemical basis of hemolysis in vitamin E deficiency.		

	Describe the clinical manifestations, clinically differentiating features and clinical course of patient with anemia.	Hematology	
	Describe the indications, and expected benefits of splenectomy in hematological and immunological disorder.	Hematology/ Surgery	
	Explain the risks and complications of splenectomy.		
	Discuss the preventive measures and basic perioperative considerations associated with splenectomy.		
	Describe etiology, pathogenesis, clinical types and diagnosis of thalassemia with emphasis on incidence, common mutations, associated psychosocial problems and prevention.	Hematology	
	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 does electrophoresis help 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.	Hematology/ Biochemistry	

	Describe etiology, clinical features, lab diagnosis of Von Willebrand's disease, Hemophilia A&B and Polycythemia. Explain the biochemical basis of hemorrhage in vitamin K and vitamin C deficiencies. Explain underlying mechanisms of neutropenia/agranulocytosis. Explain how does deficiency of glucose-6-phosphate translocase result in neutropenia and recurrent infections.	Hematology/ Biochemistry	
HIT-H-002	Differentiate between infective and malignant causes of leukocytosis with reference to infectious mononucleosis, acute and chronic non-specific lymphadenitis.	Hematology	Lymphoid system
	Explain Non-Hodgkin's lymphoma in terms of classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis. Explain Hodgkin's lymphoma in terms of classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis.		
	Explain the pathophysiology of lymphomas, including gastric MALT and diffuse large B-cell types. Explain the indications, procedure, and significance of lymph node biopsy in the diagnosis of lymphoma.	Surgery	
HIT-H-003	Explain classification, etiology, pathogenesis, clinical features, diagnosis, staging and prognosis of acute and chronic leukemia. Describe the clinical manifestations, clinically differentiating features and clinical course of patient with leukemia.	Hematology/ Medicine	Haemopoietic system

	Explain etiology, pathogenesis, morphology, clinical features, diagnosis, staging and prognosis of multiple myeloma.		
	Explain etiology, pathogenesis, morphology, clinical features, diagnosis, prognosis and management of disseminated intravascular coagulation (DIC).	Hematology	
	Classify anticlotting drugs. Describe the mechanisms of action, clinical uses and adverse effects of anticoagulants. Compare unfractionated heparin, LMW heparins and oral anticoagulants.	Pharmacology	
	Differentiate the mechanism of action, clinical uses, and toxicities of the oral anticoagulants (warfarin, rivaroxaban, and dabigatran). Explain the pharmacokinetic and pharmacodynamic drug interactions of warfarin.		
	Describe the mechanisms of action, clinical uses and adverse effects of antiplatelet drugs. Illustrate where the site of action of 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 and recombinant tissue plasminogen activators. Enlist the drugs used to treat bleeding disorders	Pharmacology	
	Enumerate hematopoietic growth factors. Explain their mechanism of action, uses and adverse effects.		

	Classify thrombocytopenia based on etiology. Explain the pathogenesis of decreased platelet production and survival. Describe the morphological changes in peripheral blood smear and bone marrow. Identify the clinical features of thrombocytopenia. Outline the diagnostic approaches for thrombocytopenia. Interpret the prognosis in different causes of thrombocytopenia. Describe the management strategies for thrombocytopenia. Interpret coagulation profile for bleeding disorders.	Hematology	
HIT-H-004	Explain the ABO and Rhesus blood groups, their clinical importance, and the methods of blood group typing.	Hematology	Blood Transfusion
	Explain the common indications for transfusion of blood products (red cells, platelets, and plasma). Identify the hazards and complications of blood transfusion. Discuss methods to prevent transfusion-related hazards. Apply knowledge of indications, risks, and preventive measures to different clinical scenarios.		
	Enlist the biochemical changes that occur in stored blood. Explain the significance of rejuvenation of stored blood.	Biochemistry	

GENERAL PATHOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10	
		INTEGRATING DISCIPLINE	TOPIC

HIT-Pa-001	Explain the clinical aspects of innate and acquired immunity. Explain the clinical aspects of active and passive immunity.	General Pathology	Immunology
	Classify the types of cells involved in the immune response (phagocytes, T cells, B cells, and NK cells). Explain the clinical importance of these immune cells.		
	Correlate complement activation pathways with their role in immune response to infections, autoimmunity, transplant rejection and immune deficiency disease.		
	Explain the types of Major Histocompatibility Complex (MHC) and elaborate their role in clinical diseases.		
	Classify different types of antibodies. Describe the structure and functions of major immunoglobulins (IgG, IgA, IgM, IgE, IgD). Explain the role of antibodies in immune defense and immunopathology. Interpret the clinical significance of antibodies in diagnosis. Discuss the pathological consequences of abnormal antibody responses.		
HIT-Pa-002	Classify immunosuppressants and antibodies Explain their mechanism of action, clinical uses, and toxicities.	Pharmacology	Hematopoietic system
	Identify the major cytokines and other immunomodulating agents with their clinical applications.		
HIT-Pa-003	Classify the types of hypersensitivity reactions. Describe the immunological mechanisms underlying each type. Explain the clinical features and examples of diseases associated with each type. Discuss the laboratory and pathological findings in hypersensitivity reactions.	General Pathology	Immunology

	Interpret the clinical relevance of hypersensitivity reactions in infectious and autoimmune diseases.		
HIT-Pa-004	Describe the types of transplant rejection. Explain graft-versus-host disease and apply this knowledge to different clinical scenarios.		Transplantation
	Explain the concept and pathogenesis of autoimmunity. Classify autoimmune diseases and describe their pathological and clinical features.		Autoimmune diseases

Practicals

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15	
		INTEGRATING DISCIPLINE	TOPIC
HIT-H-005	Perform CBC on analyzer and interpret the report.	Hematology	Hematopoietic and Lymphoid System
HIT-H-006	Analyze RBC indices, Platelet Indices and WBC parameters.		Hematopoietic System
	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	Interpret ELISA results for various immunological tests.	Pathology/Immunology	Immunology

Total Weeks	Total Hours
02	64

UNIVERSITY OF HEALTH SCIENCES LAHORE

UHS

Modular Integrated Curriculum 2K23

MBBS Year – 3

MODULE-15

Forensic Medicine & Toxicology-I

POLICE LINE - DO NOT CROSS -

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

SUBJECTS INTEGRATED IN THE MODULE

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

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

THEORY			
THANATOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 05	
		INTEGRATING DISCIPLINE	TOPIC
For1-Th-001	Define life and death.	Forensic Medicine	Life & 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.		
For-Th-002	Classify post-mortem changes.	Forensic Medicine	Post-mortem changes - (Immediate early and late)
	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.		
For1-Th-003	Summarize the biochemical changes in blood,	Forensic Medicine	Bio chemical changes,

	vitreous humour and CSF after death.		after death.
For1-Th-004	List of different parameters to determine PMI. Describe rate method and concurrent methods to estimate PMI.	Forensic Medicine	Estimation of Post-mortem interval
For1-Th-005	Define sudden death. Summarize common causes of sudden death.	Forensic Medicine	Sudden death
For1-Th-006	Differentiate between modes, manner cause and mechanism of death.		Mechanism, manner, cause, modes of death,
For1-Th-007	Define and classify post mortem artefacts Explain medico legal significance of artefacts.	Forensic medicine	Post-mortem artefacts
For1-Th-008	Discuss the use of flow-cytometry in forensic medicine.		Flow-cytometry
For1-Th-009	Define sudden infant death syndrome. Describe the risk factors and clinical features associated with SIDS. Describe preventive strategies and parental counseling.	Forensic Medicine	Sudden infant death syndrome (SIDS)

AUTOPSY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 6	
		INTEGRATING DISCIPLINE	TOPIC
For1-Au-001	Define autopsy	Forensic medicine	Autopsy, Its types and objectives.
	Summarize types of autopsies		
	Differentiate between medical and medico legal autopsy.		
	Enlist objectives and essentials of autopsy		
For1-Au-002	Differentiate four death investigation systems i. Coroner s system, ii. Medical examiner system, iii. Continental system, iv. Procurator fiscal system in Scotland.		Global systems of death investigations
	Define autopsy protocol.		

For1-Au-003	i. Preliminary documents required for autopsy ii. Bio data. iii. Identification iv. External examination v. Internal examination vi. Conclusion. vii. Documentation.		Autopsy Protocol
	Differentiate between narrative and numerical autopsy protocol.		
For1-Au-004	Differentiate primary, secondary, and tertiary autopsy incisions.		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.		
For1-Au-005	Differentiate Letulle, Ghon, Virchow, and Rokitansky autopsy techniques.		Autopsy techniques
For1-Au-006	List the viscera with quantity to be taken for toxicological and histopathological analysis.		Collection of viscera at autopsy
	List the preservatives used for autopsy samples.		
	Explain the process of preserving viscera for forensic analysis.		
	Explain the autopsy protocol for collection/recovery, preservation, labelling and dispatch of biological and non-biological material.		
For1-Au-007	Describe standard autopsy suite.		Essential of autopsy suite
	Summarize the requirements of autopsy room.		
For1-Au-008	Summarize the hazards of autopsy.		Hazards of autopsy
For1-Au-009	Define Negative autopsy.		Negative autopsy
	Explain the causes of negative autopsy.		
For1-Au-010	Define exhumation.		Exhumation
	Enlist the objectives of exhumation.		

	Explain the procedure and limitations of exhumation.		
	Enlist the specimens collected in exhumation.		
	Summarize the precautions during exhumation		
For1-Au-011	Summarize the objectives of autopsy on mutilated dead body/fragmentary remains.	Anatomy	Examination of fragmentary / Mutilated / Skeletal remains

PERSONAL IDENTITY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 05	
		INTEGRATING DISCIPLINE	TOPIC
For1-PI-001	Define Personal Identity.	Forensic Medicine	Personal Identity
	Describe types of personal identity.		
	List the purpose of identification in living & dead.		
	Describe the parameters of personal Identity in living and dead.		
	Describe methods of determining personal identity.		
	Enlist the ages of medico-legal importance for civil & criminal responsibility.		
For1-PI-002	Determine the age of a living person for medico-legal purpose.		Age determination
	Determine the age of a fetus regarding its length, weight, and morphological features.		
	Determine the approximate age of an individual based on physical appearance and the union of ossification centers of different bones.		
	Identify the sequence of appearance of ossification centers during intrauterine life.		
	Relate the medico-legal importance of bones in the identification.		
For1-PI-003	Differentiate male and female sex based on anatomical features and chromosome analysis.	Anatomy	Sex determination

	Identify the disorders of sexual development.		
	Describe the medico legal importance of sex determination.		
	Enlist limitations of sex determination in dead.		
For1-PI-004	Describe the process of estimation of age from primary, secondary & mixed dentition.	Forensic Medicine	Forensic Odontology
	Describe different methods for age estimation from odontology.		
	Enlist the information obtained from dental forensic examination. Relate medico legal importance of identification with odontology.		
For1-PI-005	Describe the parameters to determine race of a person.		Race determination
For1-PI-006	Explain methods to determine stature of a person.		Stature estimation
For1-PI-007	Describe anthropometry with reference to age Determination.		Anthropometry
For1-PI-008	Classify fingerprint patterns according to Galton's classification.		Dactylography
	Explain different methods of recording fingerprints.		
	Describe the advantages & medico legal importance of Dactylography		
	Define Poroscopy / Locards method		
For1-PI-009	Describe the role of DNA fingerprinting in identification.	Pathology	DNA Profiling
	Enlist the samples required for DNA profiling in medicolegal cases.		
	Describe the medicolegal importance of DNA Fingerprinting.		
For1-PI-010	Discuss different methods of identification in case of mutilated, burnt and decomposed dead bodies.	Forensic Medicine	Mass Disaster Identification
	Apply the international SOP of disaster Victim Identification (DVI) in mass disaster.		

Practicals

PRACTICAL / LAB WORK			
THANATOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06+05+05	
		INTEGRATING DISCIPLINE	TOPIC
For1-Th-010	Identify the immediate, early, and late changes after death.	Forensic Medicine	Autopsy
	Calculate the estimated time since death on the basis of findings noted in the corpse.		
For1-Au-011	Prepare a death certificate of cause of death according to WHO guidelines.		WHO guidelines of death certificate
For1-Au-012	Observe the procedure of autopsy examination and dissection.	Forensic medicine	Autopsy
	Write a structured autopsy report using the standard format.		
	Demonstrate the correct method of preservation and labeling of specimens. Dispatch specimens for histopathological and toxicological analysis following standard protocols.		
For1-PI-011	Determine age and sex for identification in medico-legal cases.	Forensic medicine	Personal identification
	Take fingerprints by plain and rolling method and classify according to Galton's Classification.		
	Estimate the age of a person for medico-legal purposes.		
For1-PI-012	Identify and analyse the bite marks.		Bite marks analysis
For1-PI-013	Estimate the age of the person from the oral examination of the teeth.	Forensic medicine	Age & sex determination
	Interpret the findings from x-rays of bones for appearance and union of ossification centres for age determination.		

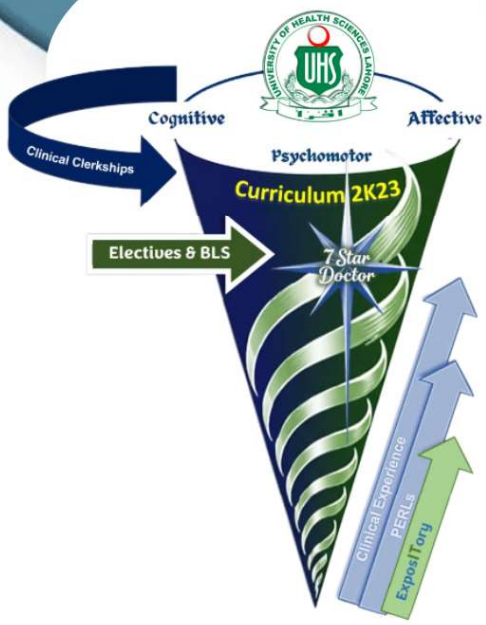
	Identify the sex and age from morphological features of different bones.		

Total Weeks	Total Hours
01	32

Modular Integrated Curriculum 2K23

MBBS Year-03

BLOCK-8



Modular Integrated Curriculum 2K23

Volume-03

MODULE 16

NEOPLASIA

MODULE RATIONALE

Neoplasia module is essential to provide MBBS students with the knowledge and skills abilities necessary to comprehend the biological, clinical, and public health aspects of cancer. this module provides the foundation for effective cancer diagnosis, management, and prevention, it guarantees that our future doctor is well prepared to address one of the most pressing healthcare challenges of our time.

Aim of this module is to provide MBBS students with a comprehensive understanding of neoplasia, preparing them to diagnose, treat, and prevent cancer effectively in their future clinical practice.

MODULE OUTCOMES

- Understand the basic concept of neoplasia, including benign and malignant tumors.
- Describe the molecular and cellular mechanisms of carcinogenesis, including the role of genetic mutations, oncogenes, tumor suppressor genes, and environmental factors
- Understand the classification of tumors based on histology, site of origin, and grading/staging systems (TNM classification).
- Explain the biological mechanisms of tumor growth, invasion, angiogenesis, and metastasis
- Explain the role of the immune system in tumor recognition and immune evasion mechanisms by cancer cells.
- Understand the general principles of cancer treatment, including surgery, chemotherapy, radiotherapy, immunotherapy, and targeted therapy.
- Understand how to utilize diagnostic tools, such as imaging and pathology (biopsy), to identify and assess neoplasms.
- Communicate effectively with patients and families about cancer diagnosis, treatment

SUBJECTS INTEGRATED IN THE MODULE

1. Pathology
2. Pharmacology
3. Radiology
4. Oncology
5. Community Medicine
6. Behavioral Sciences
7. Biochemistry
8. Surgery

IMPLEMENTATION TORs
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Syllabus

Theory

PATHOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15	
		INTEGRATING DISCIPLINE	TOPIC
N-Pa-001	Define neoplasia. Describe the nomenclature of tumors. Differentiate between benign and malignant tumors based on morphological and functional characteristics. Explain the epidemiology of cancer.	Pathology	Introduction of neoplasia
N-Pa-002	Discuss the mechanisms of cell cycle dysregulation, apoptosis evasion, and angiogenesis in tumor progression. Explain the molecular basis of cancer. Describe the pathogenesis of neoplasia, including the role of genetic mutations, oncogenes, and tumor suppressor genes. Explain the process of metastasis. Differentiate between carcinomas, sarcomas, and lymphoreticular neoplasms.		Neoplasia
N-Pa-003	Enlist the different types of carcinogenic agents. Describe the cellular mechanisms by which these carcinogenic agents induce neoplastic transformation.		Carcinogenic agents
N-Pa-004	Describe the role of biopsy and histopathology in the diagnosis of neoplasia. Explain the application of immunohistochemistry (IHC) and special stains in tumor diagnosis. Discuss the role of molecular diagnostics and common tumor markers in cancer detection and classification.		Tumor markers

N-Pa-005	Explain the tumor grading and staging. Describe treatment strategies for neoplasia in relation to grade and stage. Differentiate the processes of invasion and metastasis. Enlist common tumor markers with their clinical relevance.		Grading and Staging Invasion and metastasis
N-Pa-006	Discuss the molecular basis of cancer.		Molecular basis of cancer
N-Pa-007	Define paraneoplastic syndrome. Describe the clinical features of common paraneoplastic syndromes. Correlate specific paraneoplastic syndromes with their corresponding neoplastic lesions.		Paraneoplastic syndrome

BEHAVIOURAL SCIENCES

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 01	
		INTEGRATING DISCIPLINE	TOPIC
N-BhS-001	Discuss strategies to improve quality of life and provide holistic care for terminal cancer patients. Explain the principles of palliative care, including pain management and psychological support. Describe the importance of mental health support in the care of cancer patients.	Behavioural Sciences	Mental Health and Support in Cancer Patients

BIOCHEMISTRY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
N-B-001	Discuss molecular alterations in oncogenes and tumor suppressor genes. Describe the role of epigenetic modifications in cancer initiation and progression.	Biochemistry	Molecular Alterations in Cancer

RADIOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06	
		INTEGRATING DISCIPLINE	TOPIC
N-Ra-001	Explain the principles, applications, and limitations of common radiological imaging techniques: X-rays, ultrasound, CT scans, MRI, PET scans, and mammography.	Radiology	Radiology modalities
N-Ra-002	Explain basic principles of ionizing and non-ionizing radiation. Describe radiation protection measures and legal/ethical considerations in medical imaging. Identify common hazards of imaging and strategies to minimize patient and staff exposure. Recognize the consequences of inappropriate or wasteful imaging.		
N-Ra-003	Identify radiological signs of cancer across different imaging modalities. Explain how imaging aids in the detection of primary tumors and metastases. Compare the sensitivity and specificity of various imaging techniques (e.g., CT vs. MRI for brain tumors) in cancer diagnosis.		Role of Imaging in Cancer Detection and Diagnosis
N-Ra-004	Identify radiological findings associated with complications like: i. Tumor obstruction ii. Bone metastasis iii. Brain metastasis iv. Vascular invasion or thrombosis		Radiological Signs of Cancer Complications.

PHARMACOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10	
		INTEGRATING DISCIPLINE	TOPIC
N-Ph-001	Explain the pathophysiology of the cell cycle.	Pharmacology	Cell cycle

	Describe how abnormalities in the cell cycle lead to oncogenesis.		
N-Ph-002	Explain the mechanism of action, adverse effects, indications, and drug interactions of various classes of cell cycle–specific and non-specific antitumour agents. Describe the drugs used for palliative therapy in various tumours. Discuss the drugs related to rehabilitation. Explain the drugs used during phases of radiotherapy, e.g., in tumour lysis syndrome. Describe the drugs used beside surgical resection of various tumours to treat complications. Explain the role of glucocorticoids as part of various anti-cancer cocktails.		Cell Cycle specific and non-specific anti-tumour agent

SURGERY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 01	
		INTEGRATING DISCIPLINE	TOPIC
N-S-001	Describe the basic principles and role of surgery in cancer management, including its use for curative and palliative purposes.	Surgery	Principles of oncologic surgery

COMMUNITY MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 01	
		INTEGRATING DISCIPLINE	TOPIC
N-CM-001	Define cancer screening and explain its importance. Describe the methods of screening for common cancers. Identify the major risk factors for cancer. Explain the preventive and control measures for cancer.	Community Medicine	Cancer Screening

MEDICAL ONCOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04

		INTEGRATING DISCIPLINE	TOPIC
N-M-001	Describe the common presenting complain of cancer patients and the approach to clinical examination during cancer treatment. Identify important clinical signs in patients with cancer.	Medicine/ Oncology	Presenting Complain
N-M-002	Identify the risk factors for cancer development. Discuss the role of environmental and genetic factors in cancer development.		Risk factors
N-M-003	Discuss the role of various investigations in the diagnosis and management of cancer patients.		Investigations
N-M-004	Describe the common oncological emergencies. Explain the clinical implications of tumour metastasis. Discuss the types and features of paraneoplastic syndromes.		Oncological Emergencies & Paraneoplastic syndrome
N-M-005	Discuss the role of surgery, radiotherapy, chemotherapy, and palliative care in cancer management.		Therapeutics in Oncology

Practicals

PRACTICAL

PATHOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06	
		INTEGRATING DISCIPLINE	TOPIC
N-Pa-008	Identify and differentiate between benign and malignant tumours based on gross and microscopic characteristics.	Pathology	Gross and Microscopic Identification of Benign and Malignant Tumours
	Identify lipoma, leiomyoma, and fibroadenoma of the breast under the microscope and on gross specimens.		
	Identify and differentiate the gross and microscopic features of carcinoma in situ, including ductal carcinoma in situ (DCIS) and Bowen's disease.		
	Identify and describe the gross and microscopic features of adenocarcinoma. Identify and describe the gross and microscopic features of squamous cell carcinoma.		

Total Weeks	Total Hours
1.5	46

Modular Integrated Curriculum 2K23

Volume-03

MODULE 17

INFECTIOUS DISEASES

MODULE RATIONALE

Infectious diseases pose a universal threat to human health, ranging from mild to life-threatening conditions. This module aims to equip students with essential knowledge of common infections, including their transmission, clinical presentation, diagnosis, and treatment, while emphasizing the importance of infection control and biosafety. Students will learn the pathophysiology of conditions such as sepsis, septic shock, and pyrexia of unknown origin, as well as viral, bacterial, fungal, protozoal, and helminthic infections. Integrating infection control and biosafety into the curriculum, the module covers core safety principles like proper handling of biological materials, risk mitigation strategies, and the use of personal protective equipment (PPE), ensuring that students develop the skills to manage infections effectively while safeguarding public and healthcare worker safety through preventive measures such as immunization and sterilization. This comprehensive approach fosters a deeper understanding of clinical decision-making, laboratory investigations, and public health initiatives in infectious disease management.

MODULE OUTCOMES

- Demonstrate a systematic approach to assessing patients with suspected infections, including pyrexia of unknown origin and sepsis, while adhering to biosafety protocols to minimize the risk of infection transmission during patient evaluation.
- Diagnose common viral infections such as measles, chickenpox, rubella, mumps, influenza, COVID-19, and dengue based on clinical features and diagnostic tools, applying biosafety measures during sample collection and handling.
- Outline treatment options, including antiviral therapies, supportive care, and preventive measures (e.g., immunization) for viral infections.
- Diagnose and manage gram-positive and gram-negative bacterial infections such as pharyngitis, pneumonia, enteric fever, and meningitis.
- Describe the clinical features, diagnosis, and management of clostridial infections (botulism, gas gangrene) and sexually transmitted infections like syphilis.
- Recognize the clinical features and management strategies for mycobacterial infections, with a focus on pulmonary and abdominal tuberculosis.
- Identify and manage common fungal infections, including diagnosis, treatment, and preventive measures.
- Explain the clinical features, investigations, and treatment of protozoal infections such as amoebiasis and helminthic infections like ascariasis and hookworm.
- Describe the life cycle of helminths and explain how infections like hookworm contribute to anemia, along with prevention and treatment strategies.

- Diagnose and manage acute and chronic diarrhea based on etiologies such as bacterial, viral, and protozoal infections.
- Discuss strategies for immunization and prevention of vaccine-preventable diseases, including measles, mumps, rubella, and poliomyelitis.
- Apply empirical and definitive treatment protocols for various infectious diseases, including antibiotic stewardship and antiviral therapies.
- Analyze the epidemiology of diseases like dengue, rabies, and COVID-19, and propose public health interventions for their control and prevention.
- Describe the role of surgical interventions in infections like hydatid cysts, alongside medical management approaches.
- Recognize different types of Healthcare-Associated Infections (HAI), associated pathogens, transmission routes, and prevention strategies.
- Implement effective prevention and control measures for HAI in clinical settings to ensure patient safety.
- Identify and apply biosafety measures in laboratory and clinical settings to ensure safe handling of biological materials and minimize bio risk during infectious disease management.
- Evaluate the importance of bio risk management protocols in infection prevention strategies, focusing on the safe collection, storage, and disposal of biological samples to protect both healthcare workers and patients.

SUBJECTS INTEGRATED IN THE MODULE

1. Microbiology (Pathology)
2. Clinical Pharmacology & Therapeutics
3. Internal Medicine
4. Community Medicine
5. Pead's Medicine.
6. Surgery
7. Gynecology
8. Infection Control
9. Bio-risk management (Biosafety)
10. Clinical Rotation (CR)

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

MICROBIOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 53	
		INTEGRATING DISCIPLINE	TOPIC
ID-Pa-001	Explain the morphological, pathological and diagnostic aspects of Staphylococci, Streptococci, Clostridia, Bacillus, Corynebacterium, Listeria, and Gardnerella.	Microbiology	Bacterial infectious agents
	Explain the morphological, pathological, and diagnostic aspects of *Neisseria gonorrhoeae* (gonococci), *Neisseria meningitidis* (meningococci), *Escherichia coli*, *Salmonella*, *Shigella*, *Vibrio*, *Proteus*, *Pseudomonas*, *Helicobacter pylori*, *Campylobacter*, spirochetes, *Mycobacterium*, *Chlamydia*, *Rickettsia*, and *Actinomyces*.	Microbiology	
ID-Pa-002	Explain the life cycles and diagnostic aspects of *Wuchereria bancrofti*, *Dracunculus medinensis*, *Loa loa*, *Taenia saginata*, *Taenia solium*, *Echinococcus granulosus*, *Diphyllobothrium latum*, *Hymenolepis nana*, *Giardia lamblia*, *Entamoeba histolytica*, *Plasmodium* species, *Leishmania*, *Toxoplasma gondii*, *Trypanosoma* species, Schistosoma, liver fluke, and *Naegleria fowleri*.	Microbiology	Parasitic infectious agents
ID-Pa-003	Explain the morphological, pathological, and diagnostic aspects of dermatophytes, *Malassezia furfur*, *Sporothrix schenckii*, and *Histoplasma capsulatum*.	Microbiology	Fungal infections
	Explain the morphological, pathological, and diagnostic aspects of *Coccidioides*, *Paracoccidioides*, *Blastomyces*, *Candida*, *Mucor*, *Aspergillus*, and *Cryptococcus*.		
ID-Pa-004	Explain the morphological, pathological, and diagnostic aspects of adenoviruses, papillomaviruses, polyomaviruses, poxviruses, herpesviruses,	Microbiology	Viral infectious agents

	hepadnaviruses, picornaviruses, hepeviruses, caliciviruses, and reoviruses.		
	Explain the morphological, pathological, and diagnostic aspects of retroviruses, flaviviruses, togaviruses, coronaviruses, deltaviruses, paramyxoviruses, rhabdoviruses, orthomyxoviruses, and filoviruses.		
ID-Pa-005	Enlist the organisms causing central nervous system (CNS) infections. Compare the CSF findings of viral and bacterial meningitis.	Microbiology	Microorganisms causing CNS infections
	Correlate the clinical features of CNS infections with the virulence factors, transmission, pathogenesis, and laboratory diagnosis of Streptococcus pneumoniae, Streptococcus agalactiae, Neisseria meningitidis, Haemophilus influenzae, Escherichia coli, Listeria monocytogenes, and Mycobacterium tuberculosis.		
	Correlate the clinical aspects of CNS infections with the virulence factors, transmission, pathogenesis, and laboratory diagnosis of enteroviruses, mumps virus, herpes simplex virus, adenoviruses, Cryptococcus neoformans, rabies virus, Plasmodium species (malaria), Toxoplasma gondii, and Naegleria fowleri.		
ID-Pa-006	Enlist organisms causing diarrhea & food poisoning.	Microbiology	Microorganisms causing GIT infections
	Correlate the clinical aspects of gastrointestinal (GIT) infections with the virulence factors, transmission, pathogenesis, and laboratory diagnosis of *Escherichia coli*, *Bacillus cereus*, *Salmonella* species, *Shigella* species, *Vibrio cholerae* and other *Vibrio* species, *Helicobacter pylori*, *Campylobacter jejuni*, *Clostridium* species, and *Entamoeba histolytica*.	Microbiology	

	Correlate the clinical aspects of gastrointestinal (GIT) infections with the virulence factors, transmission, pathogenesis, and laboratory diagnosis of *Giardia lamblia*, *Cryptosporidium parvum*, *Diphyllobothrium latum*, *Hymenolepis nana*, *Ancylostoma duodenale*, *Necator americanus*, *Ascaris lumbricoides*, *Enterobius vermicularis*, *Trichuris trichiura*, *Trichinella spiralis*, poliovirus, hepatitis A and E viruses, norovirus, and rotavirus.	Microbiology	
	Correlate clinically the following viruses via their virulence factors, transmission, pathogenesis, laboratory diagnosis in acute & chronic hepatitis; Hepatitis A, B, C, D, E, G	Microbiology	
	Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of Entamoeba & Echinococcus in liver infections.	Microbiology	
ID-Pa-007	Correlate clinically the virulence factors, transmission, pathogenesis, and laboratory diagnosis of organisms causing genital tract infections, including *Neisseria gonorrhoeae*, *Treponema pallidum*, *Chlamydia trachomatis*, *Mycoplasma hominis*, *Candida albicans*, *Trichomonas vaginalis*, *Gardnerella vaginalis*, hepatitis B virus, HIV, and herpes simplex virus type II.	Microbiology integrates with medicine	Sexually transmitted infections
ID-Pa-008	Describe and identify the key features, pathogenicity, and diagnostic aspects of the causative organisms of anthrax, plague, and selected bacterial zoonoses, including *Rickettsia*, *Leptospira*, *Brucella*, *Bacillus anthracis*, *Yersinia pestis*, *Francisella*, and *Bartonella*.	Microbiology	Zoonotic infections

PHARMACOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 18	
		INTEGRATING DISCIPLINE	TOPIC
ID-Ph-001	Classify cell wall synthesis inhibitors. Discuss the mechanism of action of beta lactam antibiotics,. Outline the mechanism of resistance to beta lactam antibiotics. Differentiate the clinical uses of beta lactam antibiotics. Enlist the major adverse effects of penicillin	Pharmacology	Cell Wall Inhibitors
	Discuss the mechanism of action and clinical significance of beta lactamase inhibitors.		
	Classify cephalosporin generations. Describe their antibacterial spectrum and clinical uses. Enumerate the clinical uses and enlist major adverse effects of cephalosporin generations.		
	Describe important features of the carbapenems and monobactam.		
	Enumerate the membrane active antibiotics. Describe the mechanism of action of membrane, clinical uses, adverse effects ofactive antibiotics, Describe the mechanism of resistance of membrane active antibiotics.		
	Describe antibacterial spectrum, mechanism of action, resistance, clinical uses, and toxicity of vancomycin. Describe clinical features of Redman Syndrome.		
	Enlist antibacterial spectrum of vancomycin. Discuss mechanism of action, resistance, clinical uses, and toxicity of vancomycin. Describe the pharmacological significance of Redman Syndrome.	Pharmacology	

ID-Ph-002	Explain briefly the steps of protein synthesis. Classify protein synthesis inhibitors.		Protein Synthesis Inhibitors
	Discuss mechanism of action, resistance, antibacterial spectrum, clinical uses, adverse effects of tetracyclines. Classify macrolide Describe the mechanism of action and pharmacokinetics, antimicrobial spectrum, clinical uses, adverse effects ofmacrolides. Enlist mechanism of resistance and drug interactions of macrolides. Discuss mechanism of action, pharmacokinetics, clinical uses and adverse effects of clindamycin.	Pharmacology	
	Explain mechanism of action, resistance, antibacterial spectrum, pharmacokinetics, clinical uses and adverse effects of chloramphenicol. Describe pharmacological significance of Gray Baby Syndrome. Enlist major pharmacokinetic characteristics of streptogramins.	Pharmacology	
	Classify antifolate drugs. Classify sulfonamides. Describe mechanism of action, clinical uses, and adverse effects.		
	Outline clinical features of Steven Johnsons Syndrome. Explain mechanism of actions, resistance, antibacterial spectrum, pharmacokinetics, clinical uses and adverse effects of trimethoprim andcotrimoxazole.	Pharmacology	
	Classify aminoglycosides. Describe the mechanism of action of aminoglycosides Describe the mechanism of resistance of aminoglycosides. Discuss the clinical uses, adverse effects of aminoglycosides.	Pharmacology	

	Classify Flouroquinolones. Describe the mechanism of action, resistance, clinical uses, and adverse effects of Flouroquinolones.		
ID-Ph-003	Classify antituberculosis drugs into 1st line and 2nd line agents with examples. Describe the characteristic pharmacodynamics and pharmacokinetic properties of Rifampin, Isoniazid, Ethambutol and Pyrazinamide. Discuss the adverse effects of 1st line antituberculosis drugs. Describe standard protocols (WHO recommendation) for management of newly diagnosed pulmonary tuberculosis, multidrug-resistant tuberculosis, latent tuberculosis. Describe how to monitor patients during antituberculosis drug therapy. Discuss 2nd line drugs used in treatment of multidrug resistant tuberculosis with their therapeutic and adverse effects.	Pharmacology & Medicine	Antituberculosis Therapy (ATT)
ID-Ph-004	Enumerate the drugs for leprosy. Explain standard protocols (WHO recommendation) for management of leprosy. Describe their mechanism of action and adverse effects.		Drugs used in Leprosy
ID-Ph-005	Classify antiprotozoal drugs. Classify antimalarial drugs. Describe the mechanism of action and mechanism of resistance, clinical uses, adverse effects of Antimalarial drugs. Discuss mechanism of action, pharmacokinetics, clinical uses and adverse effects of antiprotozoal drugs used for the treatment of amoebiasis, giardiasis, Leishmaniasis, and Trypanosomiasis.		Antiprotozoal Drugs

ID-Ph-006	Classify anti-helmintic drugs. Discuss mechanisms of action, clinical uses, adverse effects of anthelminthic drugs.	Pharmacology	Anti-Helminthic Drugs
ID-Ph-007	Classify antifungal drugs. Discuss drugs used for systemic mycotic infections. Discuss mechanisms of action and resistance, pharmacokinetics, clinical uses, adverse effects of antifungal drugs.		Antifungal Drugs Classification
ID-Ph-008	Classify antiviral drugs. Discuss the main steps of viral replication that are targets for antiviral drugs. Describe drugs used in treatment of herpes simplex, varicella zoster, and cytomegalovirus virus infection with their pharmacological properties, mechanism of action and adverse effects. Explain the mechanism of action, pharmacodynamics and adverse effects of acyclovir, valacyclovir, and famciclovir. Classify antiretroviral agents. Discuss their mechanism of action, resistance, pharmacokinetics, clinical uses, and adverse effects. Classify drugs for treatment of Hepatitis B & C. Discuss their mechanism of action, resistance, pharmacokinetics, clinical uses, and adverse effects. Enumerate the drugs used to treat coronavirus Describe their mechanism of action and their adverse effects.		Antiviral Agents

COMMUNITY MEDICINE			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06	
		INTEGRATING DISCIPLINE	TOPIC

ID-CM-001	Identify the risk factors of TB Analyze the local and global burden of Tuberculosis Discuss prevention and control measures for Pulmonary TB in line with WHO strategies to control TB. Explain significance of TB DOTS therapy for TB control	Community Medicine	Tuberculosis
ID-CM-002	Explain the global burden of hepatitis. Discuss the importance of awareness and screening of hepatitis. Explain effective prevention methods for each type of hepatitis. Discuss role of vaccination and public health initiatives for prevention and control of hepatitis. Describe the measures for prevention of vertical transmission (from mother to child) of Hepatitis B virus.		Hepatitis
ID-CM-003	Describe the global polio eradication initiative. Discuss the historical and current global impact of poliomyelitis vaccination efforts. Evaluate the effectiveness of different poliovirus vaccines (OPV and IPV) and outline the vaccination schedules. Discuss community health strategies for poliovirus surveillance, outbreak response, and vaccination campaigns. Describe 'end game strategy' by WHO for polio eradication.		Polio

ID-CM-004	Discuss the global distribution of measles, mumps, rubella, and their occurrence in different population groups. Describe the mode of transmission and the highly contagious nature of measles, mumps, and rubella. Discuss the role of vaccination coverage and herd immunity in controlling outbreaks of measles, mumps, and rubella. Explain public health strategies for prevention and control of measles, mumps, and rubella including vaccination campaigns, surveillance, and outbreak response.	Community Medicine	Measles, Mumps, Rubella
ID-CM-005	Describe the goals and objectives of the Expanded Program of Immunization (EPI) in Pakistan. List the key vaccines included in the EPI schedule. Identify the strategies employed to implement the EPI in various communities. Evaluate the role of healthcare workers, community leaders, and families in promoting immunization. Identify the common barriers to immunization coverage in Pakistan. Describe enhance vaccination uptake. Discuss recent developments in the EPI, Pakistan.		EPI
ID-CM-006	Describe the role of DTP vaccination in preventing diphtheria. Identify the recommended vaccine schedule for children and adults. Analyze community-based vaccination campaigns. Analyze public awareness programs & school health initiatives to control its transmission.		Diphtheria

ID-CM-007	Identify the global distribution of tetanus, including endemic areas and populations at higher risk. Describe the role of tetanus vaccination (Td or Tdap) in children and adults. Explain the importance of booster doses and timely immunization after potential exposure to contaminated wounds. Discuss the importance of seeking medical attention for injuries and educating the community about wound care.		Tetanus

INTERNAL MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 05	
		INTEGRATING DISCIPLINE	TOPIC
ID-M-001	Define pyrexia of unknown origin and state the diagnostic criteria. Classify the major etiological groups of PUO. Describe briefly the initial clinical approach to a patient with PUO.	Medicine	Pyrexia of unknown origin
ID-M-002	Define sepsis and septic shock. Identify common causes of sepsis. Describe the key clinical signs and red flags of systemic infection. Outline basic laboratory and bedside investigations to diagnose sepsis. Plan the initial management and discuss preventive strategies.		Sepsis
ID-M-003	Define meningitis. Identify the common signs and symptoms of meningitis. Describe the clinical importance of meningeal signs (Kernig's and Brudzinski's).		Meningitis

	Outline the key investigations used in the diagnosis of meningitis.		
ID-M-004	Diagnose and differentiate between upper and lower respiratory tract infections based on clinical presentation. Identify common causative organisms. Identify warning signs. Outline basic investigations to establish diagnosis and plan the management.		Respiratory tract infections

GYNAECOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
ID-GO-001	Describe the routes of transmission of Human Papillomavirus. Diagnose HPV infection based on clinical presentation. Explain the role of HPV vaccination, including recommended age groups, vaccine types, and schedules. Describe preventive strategies and predict the possible outcomes of HPV infection.	Gynaecology	HPV
ID-GO-002	Define pelvic inflammatory disease. Identify common causative organisms and risk factors. Diagnose PID based on clinical presentation. Outline the diagnostic approach and plan the management.		Pelvic inflammatory disease

PEDIATRICS MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
ID-Pe-001	Define fever in children and differentiate it from hyperthermia. Identify common causes of fever in pediatric age group.	Paediatrics	Fever in children

	Identify danger signs in a febrile child. Outline the steps of initial management and preventive measures including immunization and parental guidance.		
ID-Pe-002	Identify common infectious causes of diarrhea in children. Differentiate between mild, moderate, and severe dehydration in children based on clinical assessment findings. Outline the management plan and explain preventive measures.		Diarrhea in children
SURGERY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 02**	
		INTEGRATING DISCIPLINE	**TOPIC**
ID-S-001	List the common risk factors that predispose to surgical site infections. Identify early clinical features suggestive of a surgical site infection. Outline steps of initial management and prevention strategies. Describe the potential outcomes of untreated or poorly managed SSI.	Surgery	Surgical site infections
ID-S-002	Define surgical antibiotic prophylaxis and its role in preventing infection. Explain the principles of timing, choice, and duration of prophylaxis. Recognize the consequences of inappropriate use. Discuss the role of prophylaxis as part of a wider infection control strategy.		Antibiotic prophylaxis
INFECTION CONTROL			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 08**	

		INTEGRATING DISCIPLINE	TOPIC
ID-IC-001	Differentiate between contact, droplet, and airborne precautions for infection prevention and control. Discuss appropriate isolation and patient-care practices to prevent the spread of infectious agents. Explain the importance of adherence to transmission-based precautions in reducing healthcare-associated infections.	Community medicine	Transmission-based precautions
	Distinguish between cleaning, disinfection, and sterilization. Describe the levels of disinfection and their relevance in clinical practice. Identify commonly used sterilization methods and their indications. Explain the importance of proper instrument handling to prevent hospital-acquired infections and surgical site infections. Discuss the consequences of inadequate cleaning and sterilization.	Microbiology	Cleaning, disinfection, and sterilization.
	Define ventilator-associated pneumonia (VAP). Identify the common risk factors for VAP in critically ill and mechanically ventilated patients. Describe the typical clinical features and warning signs suggestive of VAP. Outline the basic diagnostic approach to suspected VAP. Explain the principles of prevention and discuss the potential outcomes and consequences of VAP. Identify the role of the surgical/clinical team in early recognition and prevention of VAP.	Medicine	Ventilator-associated pneumonia
	Define hospital-acquired infections and enlist its types. Describe the major risk factors for developing HAIs in hospitalized patients.	Community Medicine	Hospital acquired infections

	Identify the warning signs and clinical features suggestive of HAIs. Explain the principles of prevention and control of HAIs. Discuss the consequences of HAIs for patients, healthcare providers, and the healthcare system. Relate the importance of rational antibiotic use in preventing antimicrobial resistance linked to HAIs. Outline the role of the surgical team in preventing HAIs.		
	Discuss the safe work practices that reduce the risk of infection transmission in healthcare settings. Describe the safe disposal of sharps and waste. Explain aseptic technique and safe handling of invasive devices, in infection prevention.	Medicine/ Surgery	Safe work practices in healthcare settings

PATIENT SAFETY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 05	
		INTEGRATING DISCIPLINE	TOPIC
ID-PS-001	Define biosafety and biosafety levels according to WHO. Describe biosafety levels. Enlist the bio risk organisms in each of biosafety levels. Discuss the safety protocols of BSL 1. Discuss the safety protocols of BSL 2. Discuss the safety protocols of BSL 3. Discuss the safety protocols of BSL 4.	Microbiology	Bio-risk management (BRM)
	Define biological waste. Categorize the biological wastes. Describe procedures for segregation, storage, treatment and disposal of biological waste.		
	Define spill management. Discuss the steps for the management of a laboratory spill.		

	Define personal protective equipment. Discuss the situations under which PPE should be used by the health care professionals.		
	Discuss the SOP of transportation of biological samples.		
	Define bio risk management. Explain its relevance in healthcare and laboratory settings. Identify common biological hazards encountered in clinical, surgical, and laboratory environments. Describe key components of biorisk management. Outline the steps of proper specimen handling, safe waste disposal, and correct use of protective equipment in healthcare facilities. Explain the role of institutional policies, training, and emergency preparedness in ensuring effective biorisk management.		

Practicals

PRACTICAL

MICROBIOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10 + 04	
		INTEGRATING DISCIPLINE	TOPIC
ID-Pa-009	Identify the stained slides of Gram-positive organisms (Staphylococci, Streptococci, Streptococcus pneumoniae), Gram-negative organisms (Neisseria, Escherichia coli, Proteus), and acid-fast bacilli under microscope. *(If slides are not available, photographic slides should be used)*	Microbiology	Staining
ID-Pa-010	Interpret the culture sensitivity reports and antibiogram of gram positive and gram-negative bacteria.		Laboratory reporting
ID-Pa-011	Identify and describe the growth characteristics of organisms on common culture media: Blood agar, Chocolate agar, Nutrient agar, TCBS, MacConkey agar, LJ medium, CLED agar, TSI, Urease, Citrate, blood culture bottles, and in anaerobic jars.		Culture sensitivity
ID-Pa-012	Identify the ova, cysts, and trophozoites of protozoans, helminths, cestodes and schistosomes under microscope. Perform the urine complete examination.		Stool & Urine examination
ID-Pa-015	Perform and interpret the catalase test, coagulase test, and oxidase test.		Laboratory tests

PHARMACOLOGY

ID-Ph-009	Prepare and dispense 4 doses of APC Powder. Prepare and dispense doses of carminative mixture. Write prescription for the following clinical conditions: Urinary Tract Infection, Acute Bacillary Dysentery, Malaria, Amoebiasis, Helminthic infections, Hepatitis B	Pharmacology	Prescription

	and C, Dengue, COVID, Typhoid fever, Community acquired pneumonia and Pulmonary Tuberculosis		

Total Weeks	Total Hours
03	115

Modular Integrated Curriculum 2K23

Volume-03

MODULE 18

MUSCULOSKELETAL & LOCOMOTION-II

MODULE RATIONALE
The Musculoskeletal & Locomotion II module is designed to deepen medical students' understanding of the musculoskeletal system, integrating knowledge from multiple disciplines to enhance the management of musculoskeletal disorders and injuries. This module emphasizes the interconnectedness of various fields, including orthopedics, surgical traumatology, forensic traumatology, and rheumatology, while also incorporating essential subjects such as pathology, pharmacology, community medicine, behavioral sciences, radiology, and evidence-based medicine. Integrated Learning: This module promotes an integrated approach to understanding the musculoskeletal system. By combining orthopedics, surgical traumatology, forensic traumatology, and rheumatology, students will gain a holistic perspective on diagnosis and treatment, preparing them for the complexities of clinical practice. Pathology and Pharmacology: Understanding the underlying pathology of musculoskeletal disorders is essential for effective management. This module emphasizes the importance of pathology and pharmacology, equipping students with the knowledge to identify disease mechanisms and select appropriate pharmacological interventions for pain management and inflammation control. Community Medicine and Behavioral Sciences: Musculoskeletal disorders significantly impact community health and patient well-being. The module includes community medicine to address the epidemiology, prevention, and health promotion aspects of musculoskeletal conditions. Additionally, behavioral sciences will be integrated to enhance understanding of patient behavior, adherence to treatment, and the psychosocial factors affecting recovery. Radiology and Evidence-Based Medicine: Proficiency in interpreting radiological findings is crucial for diagnosing musculoskeletal conditions. The module will cover radiological techniques relevant to orthopedics and traumatology, allowing students to correlate imaging results with clinical findings. Furthermore, an emphasis on evidence-based medicine will teach students how to critically appraise research and apply findings to clinical decision-making, ensuring the delivery of high-quality patient care. Real-World Applications: By focusing on both common and complex musculoskeletal disorders, including those requiring surgical intervention, students will develop the skills necessary to assess and manage a wide range of conditions. This prepares them for future roles in various healthcare settings, from primary care to specialized practices.

Multidisciplinary Collaboration: The management of musculoskeletal disorders often requires a team approach, involving collaboration with specialists in orthopedics, rheumatology, radiology, and rehabilitation. This module fosters an appreciation for interdisciplinary teamwork and the importance of effective communication in providing optimal patient care.

MODULE OUTCOMES

- Explain the pathology and underlying mechanisms of common musculoskeletal disorders and injuries, including septic arthritis, osteomyelitis, fractures, and degenerative conditions.
- Identify key features of various musculoskeletal disorders, including their clinical presentations, epidemiology, and impact on community health.
- Perform thorough musculoskeletal examinations to assess joint mobility, strength, and functional capabilities.
- Interpret relevant imaging studies (e.g., X-rays, MRI, CT scans) to aid in the diagnosis and management of musculoskeletal conditions.
- Apply appropriate first aid measures for common musculoskeletal injuries, including immobilization techniques and pain management strategies.
- Integrate knowledge from orthopedics, surgical traumatology, forensic traumatology, and rheumatology to develop comprehensive management plans for patients with musculoskeletal conditions.
- Collaborate effectively with healthcare professionals from diverse specialties, including pathology, pharmacology, community medicine, behavioral sciences, and radiology, to enhance patient care.
- Critically evaluate and apply current evidence-based guidelines and research findings to inform clinical decision-making in the management of musculoskeletal disorders.
- Formulate treatment plans that incorporate pharmacological and non-pharmacological interventions based on best practices and individual patient needs.
- Demonstrate empathy and effective communication skills when interacting with patients suffering from musculoskeletal disorders, ensuring a patient-centered approach to care.
- Educate patients about their conditions, treatment options, and the importance of adherence to management plans for optimal outcomes.
- Recognize the ethical considerations and challenges in the management of musculoskeletal disorders, including issues related to informed consent, patient autonomy, and resource allocation.

- Exhibit professionalism in all interactions with patients, families, and healthcare team members, promoting a culture of respect and trust.

SUBJECTS INTEGRATED IN THE MODULE

1. Orthopedics
2. Rheumatology
3. Surgery/ Traumatology
4. Forensic Traumatology
5. Pathology
6. Pharmacology
7. Community Medicine
8. Behavioural Sciences
9. Radiology
10. Evidence-Based Medicine

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

RHEUMATOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 17	
		INTEGRATING DISCIPLINE	TOPIC
MS2-Rh-001	Explain the immunopathogenesis and underlying mechanisms leading to Rheumatoid Arthritis (RA). Diagnose RA based on characteristic clinical features. Differentiate RA from other causes of polyarthritis based on clinical and laboratory findings. Interpret relevant investigations. Discuss the diagnostic criteria for confirming RA. Outline the management plan.	Rheumatology/ Medicine	Rheumatoid Arthritis
MS2-Rh-002	Identify risk factors for contributing to the development and progression of osteoarthritis. Describe the clinical features and typical pattern of joint involvement in OA. Differentiate OA from other types of arthritis based on clinical presentation and investigation. Interpret relevant diagnostic investigations. Outline management plan. Identify the complications and functional limitations associated with OA.	Rheumatology/ Medicine	Osteoarthritis (OA)

MS2-Rh-003	Define crystal arthritis. Differentiate between gout and pseudogout. Describe the pathophysiology of monosodium urate and calcium pyrophosphate crystal deposition in joints. Identify risk factors and precipitating causes associated with gout and pseudogout. Describe clinical features and stages of gout. Interpret relevant laboratory and imaging findings. Discuss management strategies. Identify potential complications.	Rheumatology/ Medicine	Crystal Arthritis (Gout/Pseudo gout)
MS2-Rh-004	Define systemic inflammatory vasculitis and classify its major types. Describe the pathophysiological mechanisms underlying systemic vasculitis. Identify common etiological factors and associations of systemic vasculitis. Identify the characteristic clinical features and organ involvement in different types of vasculitis. Discuss the diagnostic approach including relevant laboratory tests, imaging, and biopsy findings. Differentiate between major types of vasculitis on the basis of clinical and diagnostic features. Outline principles of management including pharmacological and supportive therapies. Discuss potential complications and long-term outcomes of systemic inflammatory vasculitis.	Rheumatology/ Medicine, Integrate with Pathology	Systemic Inflammatory Vasculitis

MS2-Rh-005	Describe the genetic predisposition and immunopathogenesis of ankylosing spondylitis. Identify the cardinal clinical features of ankylosing spondylitis. Interpret the diagnostic criteria and characteristic radiological findings. Differentiate ankylosing spondylitis from mechanical back pain and other spondyloarthropathies. Outline treatment principles including pharmacological, physical therapy, and lifestyle modifications. Describe its complications, disability risks, and long-term prognosis.	Rheumatology/ Medicine	Ankylosing spondylitis.
MS2-Rh-006	Define SLE and describe its immunopathogenesis. List common risk factors and triggers (genetic, environmental, hormonal). Identify the clinical manifestations involving skin, joints, kidneys, hematological and nervous systems. Describe diagnostic criteria and relevant laboratory investigations. Outline the principles of management including pharmacological and supportive measures.	Rheumatology/ Medicine	Systemic Lupus Erythematosus (SLE)
MS2-Rh-007	Define systemic sclerosis and classify its major types. Describe the pathophysiological changes in it. Identify the key clinical features including skin thickening, Raynaud's phenomenon, and internal organ involvement.	Rheumatology/ Medicine	Systemic sclerosis

	Identify diagnostic tests and autoantibodies associated with systemic sclerosis. Outline the management strategies including symptomatic treatment and prevention of complications.		
MS2-Rh-008	Define polymyositis and dermatomyositis, highlighting their autoimmune basis. Identify characteristic clinical features. Discuss laboratory and diagnostic investigations. Outline the management approach including immunosuppressive therapy and physiotherapy.	Rheumatology/ Medicine	Polymyositis and dermatomyositis
MS2-Rh-009	Define Sjögren's syndrome and differentiate between primary and secondary forms. Describe the pathophysiology involving lymphocytic infiltration of exocrine glands. Recognize typical clinical features including xerostomia, keratoconjunctivitis sicca, and systemic manifestations. Discuss relevant diagnostic investigations (Schirmer's test, salivary gland biopsy, autoantibodies). Outline management strategies including symptomatic relief and immunosuppression when indicated.	Rheumatology/ Medicine	Sjögren's syndrome

ORTHOPEDICS &TRAUMA			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 14+12	
		INTEGRATING DISCIPLINE	TOPIC

MS2-Orth-001	Explain the classification of fractures using the AO system. Describe principles of fracture healing. Differentiate between complete and incomplete fractures.	Orthopedics, Radiology	Fracture Classification and Healing
MS2-Orth-002	Discuss pediatric fractures and their management. Explain Salter-Harris classification for growth plate injuries.	Orthopedics	Pediatric Fractures
MS2-Orth-003	Define osteoporotic fractures and their clinical features. Identify common sites of osteoporotic fractures. Discuss risk factors for osteoporosis.	Orthopedics	Osteoporotic Fractures
MS2-Orth-004	Define pathological fractures and differentiate from traumatic fractures. Identify causes of pathological fractures. Describe diagnostic approaches for pathological fractures. Explain management options for pathological fractures.	Orthopedics	Pathological Fractures

MS2-Orth-005	Classify sports injuries and their management. Describe common sports injuries in upper and lower limbs. Discuss pathophysiology of muscle strains and ligament sprains. Explain biomechanics of gait and malalignment injuries. Outline injury prevention strategies in sports. Analyze rehabilitation processes for sports injuries. Discuss use of assistive devices in rehabilitation. Explain psychological impact of sports injuries. Describe nutritional roles in recovery from sports injuries. Outline surgical intervention in severe sports injuries.	Orthopedics	Sports Injuries
MS2-Orth-006	Define achondroplasia as the most common skeletal dysplasia and describe its effect on bone growth. Identify the characteristic skeletal features. Identify musculoskeletal complications due to achondroplasia. Interpret characteristic radiographic findings relevant to diagnosis and follow-up. Outline management principles. Discuss the role of surgical and non-surgical interventions in improving function and quality of life.	Orthopedics	Achondroplasia
MS2-Orth-007	Define scoliosis and its types. Identify clinical features and screening methods for scoliosis. Discuss treatment options for scoliosis. Describe multidisciplinary approach in managing scoliosis.	Orthopedics	Scoliosis

MS2-Orth-008	Define osteogenesis imperfecta and describe its genetic basis and abnormal collagen formation. Identify the key skeletal manifestations. Identify associated musculoskeletal complication. Interpret characteristic radiological features of OI used for diagnosis and monitoring. Discuss the principles of management.	Orthopedics	Osteogenesis Imperfecta
MS2-Orth-009	Define Marfan syndrome and describe its genetic basis. Identify the characteristic skeletal features. Identify orthopedic complications. Interpret relevant clinical and radiological findings used in diagnosing skeletal involvement. Outline principles of management.	Orthopedics	Marfan syndrome
MS2-Orth-010	Define septic arthritis and identify its etiological agent. Explain the pathogenesis of joint infection and subsequent cartilage destruction. Identify the clinical features of acute septic arthritis in children and adults. Identify key diagnostic investigations. Outline the management plan. Discuss its potential complications.	Orthopedics	Septic Arthritis
MS2-Orth-011	Define clubfoot and describe its anatomical deformities. Explain the embryological and etiological basis of clubfoot. Describe the clinical presentation and methods of clinical assessment. Outline the principles of management with emphasis on non-surgical correction. Describe indications for surgical intervention and explain operative correction.	Orthopedics/ Pediatric Surgery	Clubfoot (Congenital Talipes Equinovarus – CTEV)

	Discuss prognosis and importance of early detection and compliance with treatment.		
MS2-Orth-012	Differentiate acute, subacute, and chronic forms of osteomyelitis. Identify its risk factors and describe its pathophysiology. Describe radiological features of osteomyelitis. Identify typical clinical features of osteomyelitis. Outline management strategies and discuss complications.	Orthopedics / integrate with Pathology	Osteomyelitis
MS2-Orth-013	Define severe trauma and recognize its impact on morbidity and mortality. Describe the concept of the “golden hour” and its relevance in trauma care. Apply the principles of primary survey (ABCDE) for rapid assessment and stabilization. Identify immediate life-threatening conditions requiring urgent intervention. Outline the steps of secondary survey for detailed evaluation after initial stabilization. Discuss the role of resuscitation, monitoring, and adjunct investigations in trauma management. List the indications for urgent surgical referral and definitive management.	Orthopedic/ Surgery / Emergency Medicine	Early Assessment and Management of Severe Trauma

MS2-Orth-014	Define traumatic brain injury and classify it by severity and type. Describe the pathophysiology of primary and secondary brain injury. Identify the clinical features of TBI, including altered consciousness, focal neurological deficits, and signs of raised intracranial pressure. Apply the principles of initial assessment using ATLS framework with emphasis on Glasgow Coma Scale. Identify red flag signs that indicate urgent neurosurgical referral. Discuss the role of imaging in diagnosis and follow-up. Outline plan for acute management and identify potential complications.	General Surgery / Neurosurgery / Emergency Medicine	Traumatic Brain Injury
MS2-Orth-015	Classify spinal and cervical spine trauma injuries by mechanism and level. Describe the pathophysiology of spinal cord injury, including primary and secondary injury processes. Identify the clinical features of cervical and thoracolumbar spine trauma. Apply the principles of initial assessment and stabilization. Identify key radiological investigations for diagnosis and assessment of stability. Plan initial management and enumerate complications of spine trauma. Identify indications for surgical versus conservative management of spinal injuries.	Orthopedics/ Neurosurgery	Neck and spine trauma
MS2-Orth-016	Classify common facial fractures. Describe key clinical features and complications, including airway compromise. Explain initial assessment and stabilization in facial injuries.	Maxillofacial Surgery/ Emergency medicine	Maxillofacial trauma

	Identify appropriate diagnostic investigations, especially imaging. Outline plan for definitive management and multidisciplinary care.		
MS2-Orth-017	Define thoracic trauma and classify it into blunt and penetrating types. Describe life-threatening chest injuries including tension pneumothorax, massive hemothorax, flail chest, cardiac tamponade. Apply the principles of initial assessment and stabilization using the ATLS approach. Identify key diagnostic tools for evaluation. Outline principles of acute management	Surgery/ Emergency medicine	Thoracic trauma
MS2-Orth-018	Classify abdominal trauma based on mechanism and organ involvement. Identify the clinical presentation and red flag signs indicating severe intra-abdominal injury. Discuss the role of bedside and imaging investigations in diagnosis. Outline the early surgical and supportive management plan to prevent morbidity and mortality.	Surgery/ Emergency medicine	Abdominal trauma
MS2-Orth-019	Describe the common types and mechanisms of extremity trauma. Identify life- and limb-threatening conditions. Apply principles of initial assessment and stabilization. Outline indications for urgent referral to orthopedic/trauma specialists. Educate patients and attendants regarding basic care, need for follow-up, and complications.	Orthopedic/ Emergency medicine	Extremity trauma

PATHOLOGY, PHARMACOLOGY, COMMUNITY MEDICINE			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02+04+02	
		INTEGRATING DISCIPLINE	TOPIC
MS2-Pa-001	Describe the morphological features of acute and chronic osteomyelitis.	Pathology	MSK Diseases & Tumors
	Discuss the etiology, pathophysiology, morphology, clinical manifestations and diagnostic criteria of Rheumatoid Arthritis (RA)		
	Discuss the etiology, pathophysiology, morphology, clinical manifestations and diagnostic criteria of Osteoarthritis (OA)		
	Discuss the etiology, pathophysiology, morphology, clinical manifestations and diagnostic criteria of Crystal Arthritis (Gout/Pseudogout).		
	Describe the pathophysiology and morphology of Paget disease		
	Classify bone, cartilaginous and soft tumors.		
	Discuss the etiology, pathophysiology, morphology, clinical manifestations and radiological findings of bone, cartilaginous and soft tumors.		
MS2-Ph-001	Classify the drugs used in acute and chronic gout. Describe key pharmacokinetic parameters of commonly used anti-gout drugs. Explain the mechanism of action, clinical uses, and important adverse effects of NSAIDs, colchicine, corticosteroids, xanthine oxidase inhibitors, uricosurics, and uricase in the management of acute and chronic gout. Recognize major toxicities and contraindications of anti-gout drugs	Pharmacology	Anti-gout drugs

MS2-Ph-002	Classify the drugs used in RA (NSAIDs, corticosteroids, DMARDs, biologics, targeted therapies, opioids) Describe key pharmacokinetic aspects of major drug groups. Explain the mechanism of action of NSAIDs, corticosteroids, conventional DMARDs, biologics, and JAK inhibitors in context of Rheumatoid arthritis. Discuss the clinical role of major drug categories in the management of rheumatoid arthritis and other rheumatologic disorders. Identify important adverse effects, major toxicities, precautions, and contraindications of RA drugs	Pharmacology	Drugs for Rheumatoid arthritis
MS2-CM-001	Define ergonomics and explain its relevance in the school environment. Identify common ergonomic risk factors in schools. Recognize health problems associated with poor school ergonomics. Explain methods to assess ergonomic hazards in the school setting. Propose preventive strategies and ergonomic interventions.	Community Medicine	School Ergonomics and Student Health

Practicals

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 09	
		INTEGRATING DISCIPLINE	TOPIC
MS2-Pa-002	Interpret various investigations related to joint diseases including: i. Complete Blood Count (CBC) ii. Erythrocyte Sedimentation rate (ESR) iii. C-reactive protein (CRP) iv. Creatine Kinase (CK) v. Rheumatoid factor (RF) vi. Antinuclear antibody (ANA) vii. Anti-Neutrophil Cytoplasmic Antibodies (ANCA) viii. Serum uric acid level	Pathology	Test Interpretation
	Identify morphological features of Osteomyelitis (Pictorial/slide).	Pathology	
	Identify morphological features of Osteogenic sarcoma (Pictorial/slide). Identify morphological features of lipoma and hemangioma.	Pathology	
	Interpret related cultures for diagnosis for infections	Microbiology, Pathology	
MS2-Ra-001	Interpret imaging tests to evaluate various musculoskeletal disorders including: i. X-rays ii. Computed tomography (CT) Scans iii. Ultrasound Scans iv. Bone Scans	Radiology	
MS2-Ph-003	Analyze and interpret different drugs (Neuromuscular blockers) on animals through online videos / simulations / graphs / practical performance.	Pharmacology	MSK & locomotion

	Analyze and interpret different concentrations of drugs (atracurium or skeletal muscle relaxant) on Frog's rectus muscle through online videos / simulations / graphs / practical performance.		
	Prescription writing for the following clinical conditions: Rheumatoid Arthritis, Gout (acute and chronic), Osteoarthritis		

Total Weeks	Total Hours
02	60

Modular Integrated Curriculum 2K23

MBBS Year – 3

MODULE-19

Forensic Medicine & Toxicology-II

POLICE LINE - DO NOT CROSS -

MODULE RATIONALE

This module trains the 3rd year MBBS student to handle social issues like violence, and sexual exploitation, they can identify injuries and give an inference on their cause. It equips them with skills to provide accurate medical evaluation and contribute to justice.

MODULE OUTCOMES

- Explain the biomechanics of wound production
- Determine the manner of injury
- Describe the pathophysiology of injuries and their effects on the body
- Define & Explain puberty, Impotence in males, frigidity in females, Sterility and medico-legal importance.
- Reproduce different sections of law relevant to sexual offenses.

SUBJECTS INTEGRATED IN THE MODULE

1. Pathology
2. Surgery
3. Gynae / Obs.

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

THEORY			
TRAUMATOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
For2-Tr-001	Define injury, wound and hurt. Classify injuries on the basis of causative weapons. Classify injuries as per Qisas and Diyyat Act.	Forensic Medicine	Injury
For2-Tr-002	Explain mechanism of wound production with reference to subject, object and contact.		Wound production
For2-Tr-003	Define and classify abrasions. Describe mechanism of production of abrasions. Differentiate between different types of abrasions. Explain medicolegal importance of abrasions.		Abrasion
For2-Tr-004	Define and classify bruises. Explain pathophysiology of color changes in the bruise. Assess the age of wound from color changes of wound. Distinguish between bruise, artificial bruise and hypostasis. Explain medico legal importance of bruises.		Bruise
For2-Tr-005	Define and classify lacerated wound. Differentiate between a lacerated wound and incised wound on gross examination. Explain its medico legal importance.		Laceration
For2-Tr-006	Describe different types of fractures of bones. Interpret the age of fractures from radiological findings. Illustrate stages of healing of fractures of bones. Interpret and document the nature of the fracture in the injury certificate as per Qisas and Diyat act. Explain medico-legal importance of fracture of bone/tooth.	Forensic Medicine	Fractures

For2-Tr-007	Differentiate between ligature marks due to hanging and strangulation. Describe nonspecific and specific autopsy findings of hanging. Explain the process to remove and preserve the ligature material used.		Strangulation / Hanging
For2-Tr-008	Define throttling. Identify external and internal autopsy findings of death due to throttling. Determine the position of assailant and victim from external marks on neck.		Throttling
For2-Tr-009	Define smothering, gagging, choking, and traumatic asphyxia. Explain the mechanisms and sequence of events leading to death due to asphyxia. Enumerate common causes and situations where asphyxia occur. Identify characteristic external findings and typical internal autopsy findings. Differentiate between smothering, gagging, choking, and other forms of mechanical asphyxia based on postmortem findings.		Asphyxia

SPECIAL TRAUMATOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 12	
		INTEGRATING DISCIPLINE	TOPIC
For2-Tr-010	Describe the pathophysiology of injuries. Explain effects of injuries on the body.	Forensic medicine/ Pathology	Pathophysiology of injuries
For2-Tr-011	Describe methods to determine age of wound. Describe different methods of determination of ante mortem/ post mortem nature (vital reaction) of a wound.	Forensic medicine	Timing of injury / ante mortem, post mortem nature of wound

For2-Tr-012	Link sequelae of trauma to its original cause and search for the relationship of sequelae to pre-existing disease.		Ewing's postulates
For2-Tr-013	Explain battered baby or Caffey syndrome from a medicolegal point of view. Diagnose a case of a battered baby on the basis of different injuries sustained.		Battered baby syndrome
For2-Tr-014	Define torture. Explain reasons, types and complications of torture. Describe medicolegal aspects of torture.		Torture
For2-Tr-015	Examine and prepare medico-legal report of an injured person with different etiologies in a simulated/supervised environment.		Medicolegal Certification of injury
For2-Tr-016	Define fire arms and ballistics. Classify fire arm. Explain different parts of fire arm weapons. Describe ammunition used in firearms. Explain chain of events of firing.		Internal ballistics
For2-Tr-017	Explain the factors affecting the trajectory of bullet after its exit from the muzzle end.		External Ballistics
For2-Tr-018	Interpret wound complex produced by a rifled and non-rifled weapons at different ranges. Calculate the distance of fire from the wound examination. Differentiate between entry and exit wounds of fire arms. Explain medicolegal importance of fire arm injuries.		Terminal Ballistics
For2-Tr-019	Identify gun powders and ammunition used through different methods.		Gun powders
For2-Tr-020	Describe mechanics of blast injuries. Explain effects of blast injuries on human body. Describe medicolegal aspects of blast injuries.		Blast injuries
For2-Tr-021	Explain mechanism of injuries to soft and bony tissues of head, neck, chest, abdomen and limbs.		Regional Injuries

	Describe effects of injuries to head, neck, chest, abdomen and limbs. Describe medicolegal aspects of regional injuries.		
For2-Tr-022	Classify transport accidents. Describe different factors involved in the causation of RTA. Classify and describe different patterns of injuries sustained by pedestrians and occupants of the vehicles. Explain medicolegal significance and prevention of RTA.		Transportation Injuries
For2-Tr-023	Define thermal injuries. Classify thermal injuries-flame burns and scalds. Describe degree of burns according to different classifications. Calculate percentage of burnt surface area and their effects on the body. Describe management of the burnt patient clinically. Appraise causes of death due to burn. Determine age of burn and ante-mortem/post mortem nature of burn. Describe autopsy findings and medico legal importance of burns.	Forensic medicine	Thermal Injuries / Burn
For2-Tr-024	Classify electrical injuries injuries-low voltage and high voltage. Explain factors affecting electrocution. Describe mechanism and causes of death in electrocution. Interpret different patterns of electrical injuries due to low and high voltage current and lightening. Describe autopsy findings and medico legal importance of electrocution		Electrocution Lightening
For2-Tr-025	Explain deaths from exposure to high environmental temperature like heat stroke, heat cramps and heat exhaustion.		Hyper / Hypothermia/ Starvation

	Explain deaths from exposure to low environmental temperature like frost bite, trench foot, immersion foot. Describe their mechanism of development, autopsy findings and medicolegal importance. Interpret starvation, causes, clinical findings, autopsy findings and medicolegal importance.		
For2-Tr-026	Describe chemical burns. Explain mechanism of development of chemical burns. Describe autopsy findings. Summarize the chemical buns as per qisas and diyat act. Describe medicolegal importance of chemical burns.		Chemical Burns
For2-Tr-027	Define and classify drowning. Explain mechanism of death in wet and dry drowning. Describe external and internal autopsy findings in wet and dry drowning. Interpret biochemical and diatom tests. Emphasize medicolegal importance of drowning.		Drowning

MEDICOLEGAL ASPECTS OF SEXUAL OFFENCES

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 5	
		INTEGRATING DISCIPLINE	TOPIC
For2-Se-001	Define terms: impotency, frigidity in females, and sterility. • Explain their causes. • Describe their medico legal importance.	Forensic Medicine/ OBGYN	Impotency frigidity and sterility
For2-Se-002	Explain signs of virginity and defloration. Interpret medico legal importance.		Virginity and defloration
For2-Se-003	Describe presumptive, probable and sure signs of pregnancy in living and dead.		Pregnancy
For2-Se-004	Explain recent and old signs of delivery in living and dead.		Delivery
For2-Se-005	Define and classify abortions. Explain motives for criminal abortions.		Abortion/Miscarriage

	Reproduce different methods of inducing criminal abortion. Outline complications and causes of death due to abortion. 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.		
For2-Se-006	Classify sexual offenses and explain their medico legal importance. Describe sexual perversions and identify the traits. Explain different sections of law relevant to sexual offenses. Write a report on medico-legal examination of a victim of sexual assault. Describe the medico-legal examination in unnatural sexual offence. Outline collection, preservation and dispatch of specimens in cases of sexual assaults to chemical examiner. Interpret psycho-pathology of assailant. Interpret Psycho-pathology of victim. Plan initial management & referral of victim.		Sexual Offences
For2-Se-007	Define infanticide. Describe status of infants-still born/dead born/live born. Describe autopsy findings to determine whether live born or not, cause of death, age of new born and others.	Forensic Medicine	Infanticide

Practicals

PRACTICAL / LAB WORK			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 09	
		INTEGRATING DISCIPLINE	TOPIC
For2-Tr-028	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)	Forensic medicine	Mechanical injuries
For2-Tr-029	Differentiate between different types of abrasions.		Abrasion
For2-Tr-030	Assess the age of a bruise on the basis of color changes. Differentiate between a bruise and post mortem staining.		Bruise
For2-Tr-031	Differentiate between a lacerated and incised wound on naked eye examination.		Wound
For2-Tr-032	Identify the type of fracture on X-rays. Apply different sections of Qisas and Diyat Act from examination of fractures on X-rays.		Fracture
For2-Tr-033	Identify hurt and apply relevant section of Qisas and Diyat Act for: i. Itlaf-udw ii. Itlaf -slahiat-udw iii. Shajja iv. Jurh		Hurt / Qisas N Diyat Act
For2-Tr-034	Examine an injured person. Issue certificate of injury in a simulated/supervised environment.		Certification of injury
For2-Tr-035	Identify different types and parts of fire arm weapons. Identify different parts of ammunition. Determine the type of fire arm weapon from the examination of fire arm wound complex. Calculate the firing range of the weapon from		Firearm

	appearance of wound. Identify characteristics of entry and exit fire arm wounds.		
For2-Tr-036	Differentiate between dry burn and wet burn. Calculate burnt surface area. Determine age and nature of burn on naked eye examination.		Burn
For2-Tr-037	Identify between entry and exit wounds of electric currents on body. Describe different pathways of electric currents through human body. Identify different patterns of electrical injuries.		Electrocuted injury
For2-Tr-038	Identify different patterns of effects of high/low environmental temperature on the body. Identify the autopsy findings of death due to starvation.		Hypo / Hypothermia / starvation
For2-Tr-039	Identify different patterns of chemical burns over body. Apply relevant sections of Qisas And Diyat Act.		Chemical Burns

SEXOLOGY

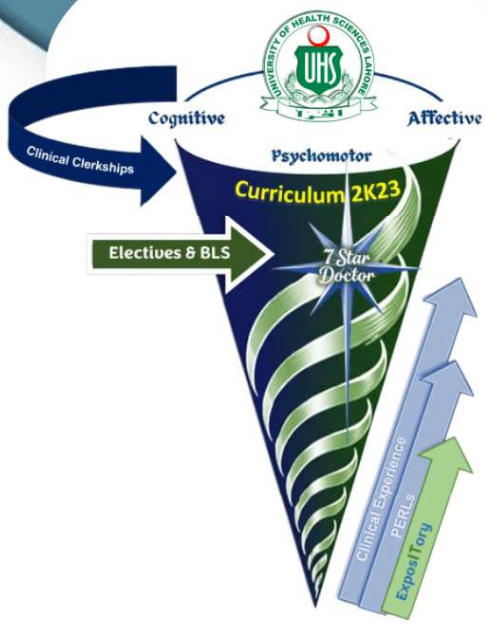
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06	
		INTEGRATING DISCIPLINE	TOPIC
For2-Se-008	Demonstrate Medico-legal examination of the alleged accused of rape and issue report. Perform collection, preservation and dispatch of specimens in cases of sexual assaults to chemical examiner.	Forensic medicine	Sexual assault

Total Weeks	Total Hours
01	35

Modular Integrated Curriculum 2K23

MBBS Year-03

BLOCK-9



Modular Integrated Curriculum 2K23

Volume-03

MODULE 20

CARDIOVASCULAR-II

MODULE RATIONALE

The Cardiovascular System (CVS 2) Module is designed to provide an understanding of cardiovascular diseases (CVDs), which are a leading cause of global morbidity and mortality. This module is critical at this stage of medical education as it integrates foundational knowledge from basic sciences—such as anatomy, physiology, and pathology—with clinical application in general medicine, surgery, cardiology, pharmacology, and vascular surgery. The module emphasizes the pathophysiology, clinical manifestations, diagnostic approaches, and management strategies for common and critical cardiovascular conditions, including coronary artery disease, valvular heart disease, aneurysms, cardiomyopathies, congenital heart diseases, and vascular disorders.

MODULE OUTCOMES

- Explain the underlying pathophysiological mechanisms of cardiovascular diseases and correlate them with clinical signs and symptoms.
- Apply concepts from general medicine, surgery, cardiology, pharmacology, pathology, and vascular surgery to understand and manage cardiovascular diseases.
- Recognize and diagnose common and critical cardiovascular disorders using clinical features, physical examination, and diagnostic tools such as ECG, echocardiography, and laboratory investigations.
- Develop comprehensive, evidence-based management strategies, including medical, pharmacological, and surgical interventions, for treating cardiovascular diseases.
- Competently interpret diagnostic studies (e.g., ECG, echocardiography, and imaging) and use them to guide patient care decisions.
- Understand the role of various pharmacological agents in the prevention, treatment, and management of cardiovascular conditions and complications.

SUBJECTS INTEGRATED IN THE MODULE

1. General Medicine
2. General Surgery
3. Pathology
4. Pharmacology
5. Cardiology

6. Vascular Surgery
7. Pediatrics
8. Biochemistry
9. Anatomy

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

GENERAL MEDICINE			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
CV2-M-001	Explain the etiology and pathogenesis of rheumatic fever. Describe the Jones Criteria and its significance in the diagnosis of rheumatic fever. Recognize the clinical features and complications of acute rheumatic fever. Discuss the pathological changes associated with rheumatic heart disease. Outline the diagnostic approach, including relevant investigations, for rheumatic fever. Summarize the principles of treatment, secondary prophylaxis, and prevention of rheumatic fever.	Medicine/ Cadiology, integrate with Pathology	Rheumatic fever
CV2-M-002	Define cor pulmonale and differentiate it from other causes of right heart failure. Classify cor pulmonale based on onset and underlying etiology. Explain the pathophysiological mechanisms involved in the development of cor pulmonale. Identify the etiological factors contributing to cor pulmonale. Diagnose cor pulmonale based on the characteristic symptoms and clinical signs Describe the diagnostic approach for cor pulmonale. Outline the principles of management and prevention of cor pulmonale.		Cor-pulmonale

CV2-M-003	Explain the pathophysiology of infective endocarditis. Identify the etiological agents responsible for infective endocarditis. Identify the clinical features and complications associated with infective endocarditis. Discuss the diagnostic approach and outline the principles of management and treatment of infective endocarditis. Describe the strategies for prevention and prophylaxis of infective endocarditis.		Infective endocarditis
CV2-M-004	Describe the common etiological factors associated with pericarditis. Explain the pathophysiological mechanisms underlying pericardial inflammation. Identify the clinical manifestations and characteristic signs of acute pericarditis. Discuss the diagnostic approaches, including relevant clinical, laboratory, and imaging findings. Explain the possible complications of acute and chronic pericarditis. Outline the management plan for patients with acute pericarditis. Discuss the preventive measures and prognosis of pericarditis.		Pericarditis

PHARMACOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 14**	
		DISCIPLINE	**TOPIC**
CV2-Ph-001	Classify antihypertensive drugs.	Pharmacology	Anti-hypertensive

	Describe their mechanisms of action, clinical uses, adverse effects, drug-interactions and contraindications. Identify the compensatory responses to antihypertensive drugs. Explain pharmacological considerations taken in hypertensive emergencies, malignant hypertension, IHDs, cardiac failure, cardiomyopathies, coarctation of aorta, diabetes mellitus, chronic renal diseases, and pregnancy.		
CV2-Ph-002	Explain strategies used in pharmacological treatment of angina. Classify anti-anginal drugs Describe their mechanism of action, uses, adverse effects Define Coronary Steal Phenomenon.		Ischemic Heart Diseases
CV2-Ph-003	Classify anti arrhythmic drugs. Describe their mechanism of action, uses, adverse effects, and drug interactions. Explain general strategies used in pharmacological treatment of cardiac arrhythmias.		Cardiac Arrhythmias
CV2-Ph-004	Classify drugs used in cardiac failure. Describe their mechanism of action, pharmacological effects, uses, adverse effects, interactions, and contraindications. Describe role of diuretics, renin–angiotensin–aldosterone system inhibitors, beta-blockers, digitalis glycosides, nitrates and hydralazine, ivabradine and their combination, anticoagulation, antiarrhythmic therapy, and statin.		Cardiac Failure
CV2-Ph-005	Classify anti-hyperlipidemic drugs. Describe their mechanism of action, uses, adverse effects and drug interactions Enlist combination therapies for treatment of hyperlipidemias.		Anti-Hyperlipidemic / Anti-Dyslipidemias

CARDIOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 14	
		DISCIPLINE	TOPIC
CV2-M-005	Differentiate stable angina, unstable angina, and myocardial infarction. Describe the symptoms and signs of CAD. Explain the pathophysiology of myocardial ischemia and infarction. List risk factors and common complications of CAD. Describe the role of laboratory tests, ECG, cardiac biomarkers, imaging, and coronary angiography. Outline medical management, PCI, CABG, and primary/secondary prevention strategies.	Cardiology, Integrate with \pathology	Coronary Artery Disease (CAD)/ Ischemic heart disese
CV2-M-006	Diagnose CCF based on clinical presentation. Explain the pathophysiology of left- and right-sided heart failure. List causes and potential complications. Describe the role of investigations such as ECG, chest X-ray, and echocardiography. Outline pharmacological and non-pharmacological treatment strategies.		Congestive Cardiac Failure (CCF)
CV2-M-007	Define and classify hypertension. List risk factors. Explain the pathophysiology of essential and secondary hypertension. Describe treatment and lifestyle modifications. List the potential complications.		Hypertension
CV2-M-008	Classify arrhythmias. Explain the pathophysiology and causes of arrhythmias. Describe the clinical features and potential complications associated with each type. Interpret findings of arrhythmia on ECG.		Arrhythmias

	Outline acute management including cardiac arrest scenarios.		
CV2-M-009	Classify valvular lesions: mitral stenosis/regurgitation, aortic stenosis/regurgitation. Explain the pathophysiology and complications of common valvular diseases. Diagnose based on clinical presentation and investigations. Describe relevant investigations, particularly echocardiography. Outline principles of management including medical therapy and indications for surgical intervention.		Valvular Heart Disease
CV2-M-010	Classify cardiomyopathies: dilated, hypertrophic obstructive, restrictive. Explain basic pathophysiology, etiology, and complications. Describe relevant investigations and general management principles. Discuss the potential complications.		Cardiomyopathies
CV2-M-011	Define and classify PVD. Explain pathophysiology and risk factors. Describe clinical features including intermittent claudication and limb ischemia. Outline diagnostic approaches including Doppler studies and angiography. Describe general management including lifestyle, pharmacological, and interventional options.		Peripheral Vascular Disease (PVD)
CV2-M-012	Classify congenital heart disease based on cyanotic and non-cyanotic types. List common congenital heart defects (e.g., VSD, ASD, PDA, Tetralogy of Fallot). Explain the pathophysiology and hemodynamic consequences of these defects.		Congenital Heart Disease

	Describe typical clinical features and presentations associated with common congenital heart defects. Outline basic diagnostic approaches, including echocardiography and relevant investigations.		
CV2-M-013	Identify the normal components of a 12-lead ECG (P wave, QRS complex, T wave, PR interval, QT interval). Identify normal heart rate, rhythm, axis, and intervals. Interpret a normal ECG tracing and confirm normal sinus rhythm.	Cardiology	ECG

PATHOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 12**	
		DISCIPLINE	**TOPIC**
CV2-Pa-001	Define aneurysm and differentiate between true and false aneurysms.	Integrate with biochemistry	Aneurysms
	Classify aneurysms based on their morphology (saccular, fusiform) and etiology (atherosclerotic, mycotic, and congenital).		
	Understand the underlying mechanisms leading to aneurysm formation, including vessel wall weakening, genetic factors (e.g., Marfan syndrome, Ehlers-Danlos syndrome), and role of atherosclerosis.		
	Identify the common sites where aneurysms form (e.g., aortic aneurysms, cerebral aneurysms, popliteal aneurysms) and explain why certain areas are more prone to aneurysm development.		
	Discuss the clinical signs and symptoms of aneurysms depending on their location (e.g., abdominal aortic aneurysm, thoracic aortic aneurysm) and size.		

	Correlate the presentation with possible complications like rupture, dissection, or compression of adjacent structures.		
	List the common diagnostic modalities used in identifying aneurysms (e.g., ultrasound, CT angiography, MRI).		
	Describe the complications of aneurysm		
	Discuss the management of aneurysm		
CV2-Pa-002	Discuss the chemical and morphological changes observed in myocardial infarction with timelines		Myocardial Infarction
CV2-Pa-003	Classify vascular tumors Discuss the pathogeneses of vascular tumors Describe the clinical presentations and morphological features of common vascular tumors along with the immunohistochemically markers	Integrate with biochemistry	Vascular tumors
CV2-Pa-004	Classify cardiac tumors and differentiate between primary and secondary (metastatic) cardiac tumors. Enlist the syndromic association of cardiac tumors	Integrate with histology	Cardiac tumors
	Outline the Principles of Management for Cardiac Tumors	Integrate with surgery	

GENERAL SURGERY/VASCULAR SURGERY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
CV2-S-001	Explain the causes of acute limb ischemia. Diagnose based on the typical clinical presentation. Differentiate acute limb ischemia from other causes of limb pain and pallor. Select appropriate investigations to confirm diagnosis. Summarize immediate and definitive management strategies. Discuss potential complications if untreated.		Acute Limb Ischemia
CV2-S-002	Describe and classify gangrene. List the causes of gangrene. Identify characteristic signs and symptoms. Distinguish gangrene from other causes of tissue necrosis. Identify investigations useful for assessment. Outline management principles including supportive and surgical care. Explain possible complications and outcomes.		Gangrene
CV2-S-003	Identify hallmark clinical features of varicose veins. Differentiate from other causes of lower limb swelling. List appropriate diagnostic methods. Summarize management strategies including lifestyle, compression, and surgical options. Discuss potential complications, including ulceration and thrombophlebitis.		Varicose Veins
CV2-S-004	Describe underlying mechanism of development of DVT. Diagnose DVT based on clinical signs and symptoms.		Deep Vein Thrombosis (DVT)

	Differentiate DVT from other causes of leg swelling and pain. Select investigations for diagnosis, including Doppler and D-dimer. Summarize management approaches, including anticoagulation and prophylaxis. Discuss complications, including pulmonary embolism.		

Practicals

PRACTICAL

PHARMACOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		INTEGRATING DISCIPLINE	TOPIC
CV2-Ph-006	Analyze and interpret drugs (acetylcholine, atropine adrenaline, propranolol) on animal through online videos / simulations / graphs / practical performance.	Pharmacology	Cardiovascular System
	Analyze and interpret different concentrations of acetylcholine on frog's heart through online videos / simulations / graphs / practical performance.		
	Prepare normal saline, dextrose saline. Prepare of 1000 ml of O.R.S. in water.		
	Prescription writing of the following conditions: hypertension (mild to moderate, hypertensive crisis/malignant hypertension), acute and chronic angina, left ventricular failure.		

Total Weeks	Total Hours
02	64

Modular Integrated Curriculum 2K23

Volume-03

MODULE 21

RESPIRATORY-II

MODULE RATIONALE

The curriculum for respiratory medicine and related fields is designed to equip students with essential knowledge and skills in managing thoracic trauma, respiratory complications, and conditions affecting respiration.

Demonstrate the qualities of compassion, honesty, and integrity in interactions with patients, families, communities, and fellow medical professionals. Exhibit a professional demeanor, foster a team-oriented spirit, and employ effective communication skills by actively participating in collaborative problem-solving, particularly in small group exercises focused on understanding respiratory disorders.

MODULE OUTCOMES

- Integrate foundational concepts to address clinical respiratory issues.
- Interpret common respiratory symptoms with accuracy in assessments.
- Outline management plans for prevalent respiratory diseases during case discussions.
- Utilize a problem-solving approach to accurately diagnose respiratory emergencies in simulated scenarios.
- Demonstrate understanding of respiratory tract malignancies and referral criteria by the end of the module.
- Identify the morphological features of common respiratory tract diseases in practical examinations.
- Demonstrate effective communication strategies in patient interactions, evaluated through peer and instructor feedback.

SUBJECTS INTEGRATED IN THE MODULE

1. Medicine
2. Surgery
3. Pathology
4. Clinical Pharmacology & Therapeutics
5. Community Medicine
6. Behavioural Sciences
7. Forensic Medicine
8. Pead's
9. Radiology

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

PATHOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 25	
		DISCIPLINE	TOPIC
Re2-Pa-001	Describe hypersensitivity reaction 1 with clinical examples Describe immune mechanism involved in HSR-I	Pathology	Hyper-sensitivity reaction (HSR) Type II
Re2-Pa-002	Define & classify asthma Discuss pathogenesis of atopic and non -atopic asthma.		Bronchial asthma
Re2-Pa-003	Define chronic bronchitis Describe the pathogenesis and morphological features of chronic bronchitis and bronchiectasis		Chronic bronchitis
Re2-Pa-004	Define and classify emphysema Describe the pathogenesis and morphological features of of emphysema		Emphysema
Re2-Pa-005	Differentiate between obstructive and restrictive pulmonary diseases List the causes of restrictive lung diseases Describe pneumoconiosis with respect to etiology and pathogenesis Enlist asbestos related diseases Describe morphologic features of asbestosis		Restrictive Lung Diseases
Re2-Pa-006	Describe various etiological factors of pulmonary pneumonia. Describe morphological features of bronchogenic and lobar pneumonia. Describe four stages of lobar pneumonia Explain the complications associated with pulmonary pneumonia		Pneumonia
Re2-Pa-007	Describe the morphological features of different types of granulomatous inflammation Describe Ghons complex.		Granulomatous Inflammation

	Differentiate between primary and secondary tuberculosis.		
Re2-Pa-008	Describe hypersensitivity reaction IV with clinical examples Describe the immune mechanism involved in HSR IV		Hypersensitivity Reaction (Hsr) Type IV
Re2-Pa-009	Classify pleural tumors Describe morphologic features of malignant mesothelioma		Pleural Tumors
Re2-Pa-010	Classify lung tumors Describe etiopathogenesis and morphologic features of lungs Tumors Enumerate paraneoplastic syndromes associated with lung tumors		Lung Tumors
Re2-Pa-011	Classify pulmonary edema according to etiology Describe clinical conditions associated with development of ARDS Describe the pathogenesis of ARDS Describe morphological features of Diffuse alveolar damage (DAD)		Pulmonary Edema & Acute Respiratory Distress Syndrome (ARDS)
Re2-Pa-012	Describe the important morphological features, virulence factors of Mycobacterium tuberculosis with their clinical significance Describe the pathogenesis of Pulmonary tuberculosis Describe the immunity and hypersensitivity against infections by Mycobacterium tuberculosis Extra pulmonary tuberculosis infections	Microbiology	Mycobacterium Tuberculosis
Re2-Pa-013	Describe Corona virus Explain the structure and antigenicity of the virus Describe the pathogenesis of corona virus Discuss the relation with pneumonia	Microbiology	COVID-19
	Enlist organisms producing respiratory tract infections	Microbiology	

Re2-Pa-014	Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of organisms causing respiratory tract infections; i. Mycobacterium tuberculosis ii. Streptococcus pneumoniae iii. Mycoplasma pneumoniae iv. Legionella pneumoniae	Microbiology	Microorganisms producing Respiratory tract infection
	Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of organisms causing respiratory tract infections; i. Haemophilus influenzae ii. Klebsiella iii. Corynebacterium diphtheria iv. Bordetella	Microbiology	
	Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of organisms causing respiratory tract infections; i. Influenza & para influenza viruses ii. RSV iii. Rhinovirus	Microbiology	
	Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of organisms causing respiratory tract infections; i. Measles ii. Pneumocystis carinii iii. Aspergillus	Microbiology	
Re2-Pa-015	Describe the important morphological characteristics, biochemical reactions, virulence factors of Bordetella pertussis with their clinical Significance Describe pathogenesis of Bordetella pertussis infections Describe lab diagnosis of Bordetella pertussis infections.	Microbiology	Bordetella Pertussis

Re2-Pa-016	Describe the important morphological characteristics, biochemical reactions, virulence factors of Streptococcus pneumoniae with their clinical significance Enumerate the diseases caused by Streptococcus Pneumoniae Describe the pathogenesis of lobar Pneumonia caused by S. pneumonia Describe the lab investigation of Streptococcus Pneumoniae infections	Microbiology	Streptococcus Pneumoniae
Re2-Pa-017	Describe the important morphological characteristics, biochemical reactions, virulence factors of H. influenzae with their clinical significance Describe the pathogenicity of H. influenzae in causation of respiratory tract infections Describe the lab diagnosis of H. influenzae infections	Microbiology	H. Influenza
Re2-Pa-018	Describe the important morphological characteristics, biochemical reactions, virulence factors of Mycoplasma pneumoniae Describe the pathogenesis of atypical pneumonia caused by M. pneumoniae Describe the lab diagnosis of M. pneumoniae infections	Microbiology	Mycoplasma Pneumoniae
Re2-Pa-019	Describe the important morphological characteristics, biochemical reactions, virulence factors of Legionella pneumophila Describe the pathogenesis of atypical pneumonia caused by Legionella pneumophila	Microbiology	Legionella
Re2-Pa-020	Define Chlamydia. Enumerate their medically important species Enumerate the diseases caused by Chlamydia Describe the important morphological characteristics, biochemical reactions, virulence factors of Chlamydia and their clinical significance. Describe the pathogenesis of C. trachomatis, C. pneumoniae, C. psittaci mediated atypical pneumonias	Microbiology	Chlamydiae & Coxiella Laburnetii

	Describe the lab diagnosis of Chlamydial infections		
Re2-Pa-021	Describe the important morphological characteristics, biochemical reactions, virulence factors of Bacillus anthracis with their clinical significance. Describe the lab diagnosis of Bacillus anthracis infections.	Microbiology	Bacillus Anthracis
Re2-Pa-022	Describe the important morphological characteristics, biochemical reactions, virulence factors of Yersinia pestis and their clinical significance Describe the pathogenesis of plague Describe the lab diagnosis of Yersinia pestis infections	Microbiology	Yersinia Pestis

PHARMACOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 17**	
		DISCIPLINE	**TOPIC**
Re2-Ph-001	Classify the drugs used to treat asthma Discuss the role of different drugs in the prevention & treatment of asthma. Describe the mechanism of action & adverse effects of Beta 2 agonists used in asthma. Describe the mechanism of action, actions & adverse effects of Methylxanthines. Describe their mechanism of action, clinical uses and adverse effects of drugs used to treat bronchial asthma. Discuss the roles of corticosteroids in the treatment of bronchial asthma. Define status asthmaticus and its management.	Clinical Pharmacology & Therapeutics	Anti-Asthmatic drugs
Re2-Ph-002	Classify the drugs used for hospital and community-acquired pneumonia Describe the mechanism of action for each class		Drugs for treatment of pneumonia
Re2-Ph-003	Define autacoids. Enlist major histamine receptors. Classify anti-histamine drugs.		Autacoids

	Describe clinical uses, and toxicity of antihistamines. Classify serotonin agonists & antagonists. Describe the clinical uses, and adverse effects of serotonin agonists & antagonists. Enumerate ergot alkaloids. Describe the mechanism of action, clinical uses, and toxicity of ergot alkaloids. Enlist the types of prostaglandins. Describe the mechanism of action, clinical uses, and adverse effects of prostaglandins.		
SURGERY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 08**	
		DISCIPLINE	**TOPIC**
Re2-S-001	Describe mechanism of tension pneumothorax (T.P.) Enlist the causes of T.P. Diagnose tension pneumothorax based on clinical presentation. Outline the steps of treatment of T.P.		Tension Pneumothorax
Re2-S-002	Describe sucking chest wound. Describe the underlying respiratory physiological changes in flail chest. Define flail chest. Describe mechanism of respiratory sequel of flail chest. Describe the clinical features of flail chest. Describe treatment options in flail chest. Describe steps of management of such wound.		Open Pneumothorax
Re2-S-003	Define surgical emphysema. Enumerate the causes of surgical emphysema. Describe clinical features of Surgical emphysema Describe the steps of management of Surgical emphysema. Enumerate complications.		Surgical emphysema
Re2-S-004	Describe the potential post-operative respiratory complications.		Post Op Respiratory

	Interpret the X-ray findings of post-operative pneumonia. Outline the treatment option of complications. Enlist the causes of diaphragmatic rupture Enumerate the clinical features Describe the x-ray/USG findings Describe the steps of management		Complications
Re2-S-005	Define the pulmonary contusions Enumerate the clinical features Describe the steps of management Describe complications of pulmonary contusion.		Lungs Injuries

MEDICINE/PULMONOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 19**	
		DISCIPLINE	**TOPIC**
Re2-M-001	Correlate clinical features of bronchial asthma to its pathogenesis Describe investigations of a patient with asthma Enlist features of acute severe asthma Enlist features of life-threatening asthma Discuss the step-wise therapy of stable asthma Discuss the management of acute severe asthma	Pulmonology/ Medicine	Bronchial asthma
Re2-M-002	Define COPD Describe Clinical features of COPD Outline investigation plan of a patient with COPD Describe GOLD staging criteria for COPD Outline the management of acute exacerbation of COPD Describe long term management of COPD Describe criteria for long term oxygen therapy in COPD	Pulmonology/ Medicine	COPD, Chronic bronchitis, Emphysema
Re2-M-003	Enlist the causes of bronchiectasis Describe the clinical features of bronchiectasis Describe investigations of bronchiectasis Enlist the complications of bronchiectasis Describe the management of bronchiectasis	Pulmonology/ Medicine	Bronchiectasis
Re2-M-004	Enlist the causes of ILD Describe the clinical features of interstitial lung diseases	Pulmonology/ Medicine	Interstitial Lung Diseases

	Outline investigation plan of interstitial lung diseases Describe the treatment of interstitial lung diseases		
Re2-M-005	Describe the epidemiology prevalence and preventive measures of Tuberculosis Describe the epidemiology prevalence and preventive measures of Respiratory infections Describe the epidemiology & Prevention of Pneumoconiosis Describe the epidemiology prevalence and preventive measures of Influenza, Diphtheria, whooping cough, meningococcal meningitis Discuss the efficacy of the BCG vaccine in different populations.	Community Medicine	Preventive Measures
Re2-M-006	Define pleural effusion Differentiate between exudative and transudative pleural effusion Enlist causes of pleural effusion Describe Clinical features of pleural effusion Describe investigations in a patient with pleural effusion Describe palliative management of recurrent pleural effusion	Pulmonology/ Medicine	Pleural Effusion
Re2-M-007	Define respiratory failure Classify types of respiratory failure Describe clinical features of respiratory failure Describe management of respiratory failure		Respiratory Failure
Re2-M-008	Define Etiology, clinical features, investigations, treatment of OSA	Pulmonology/ Medicine	Obstructive Sleep Apnea
Re2-M-009	Enumerate the lab investigations to diagnose Covid 19 Describe the clinical presentation of covid-19 discuss the management protocols to treat covid patient complications Discuss the vaccination and side effect (for COVID)		COVID-19

Practicals

PRACTICAL

PATHOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 4+3	
		DISCIPLINE	TOPIC
Re2-Pa-023	Identify the morphological features of the following: Small cell carcinoma lung, Squamous cell carcinoma lung, Adenocarcinoma lung, Malignant Mesothelioma (Pictorial/slide).	Pathology	Image Session Of Respiratory System-II
Re2-Pa-024	Interpret the laboratory findings of infections Streptococcus Pneumoniae.	Microbiology	Streptococcus Pneumoniae
Re2-Pa-025	Observe/perform Ziehl–Neelsen staining on a sputum sample to detect acid-fast bacilli (Mycobacterium tuberculosis) accurately, following all biosafety and staining protocols.	Microbiology	Mycobacterium Tuberculosis
Re2-Pa-026	Interpret RT-PCR results for SARS-cov-2, identifying positive, negative, and inconclusive reports under supervision.	Microbiology	COVID-19

PHARMACOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		DISCIPLINE	TOPIC
Re2-Ph-004	Write down the prescription writing for the following conditions/diseases: Bronchial Asthma (acute severe/status asthmaticus and chronic), Cough, Allergic Rhinitis and Acute streptococcal Pharyngitis	Clinical Pharmacology & Therapeutics	Prescription Writing

COMMUNITY MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		DISCIPLINE	TOPIC
Re2-CM-001	Describe the standard preventive precautions for all patients.	Community Medicine	Isolation Precautions

	Describe the additional precautions for infected patients & for patient requiring single isolated room. Describe the precautions for family members providing care to the patient in hospital & home. Describe the use of face mask, gloves, shoe cover, cap and gown. Recognize the common errors made while using personal protective equipment. Demonstrate the method to wear face mask, gloves, shoe cover, cap and gown & remove them aseptically.		

Total Weeks	Total Hours
2.5	80

Modular Integrated Curriculum 2K23

Volume-03

MODULE 22

COMMUNITY MEDICINE & FAMILY HEALTH-I

UNIVERSITY OF HEALTH SCIENCES LAHORE

UHS

MODULE RATIONALE

The module on Community Medicine and Family Medicine is crucial for addressing the learning needs of medical students about holistic concept of health, prevalent health problems, their determinants and provision of comprehensive healthcare to the communities.

Curriculum on Community Medicine and family medicine equips future healthcare professionals with the knowledge, skills and attitude to implement preventive strategies, health promotion & reduce the burden of disease through primary health care approach targeting universal health coverage. Health outcomes are influenced by social, economic & environmental factors. It helps students understand the broader determinants of health & how to address health disparities. Public health crises such as pandemics, natural disasters & environmental hazards require professionals trained in community-based responses & health emergencies and reaching at door step through provision of family health services. Healthcare professionals must be equipped to engage in provision of health care needs at smaller scale and building health policy at local, national and global levels to improve public health outcomes.

MODULE OUTCOMES

- To apply principles of epidemiological study designs in research methodology to establish association and causations
- To apply principles of community diagnosis, screening in general population and high-risk population
- To apply the concept of environmental safety and global environmental concerns including air, water, waste disposal, radiation, noise and climate change
- To apply principles of infectious disease epidemiology in classification, prevention and control of communicable diseases
- To apply different types of surveillance in disease control, elimination and eradication
- To understand the concept of herd immunity and role of immunizing agents in disease prevention and control
- To demonstrate the difference between health education and propaganda, application of different health education, communication, information in different settings using different techniques and approaches
- To apply principles of primary health care targeting universal health care coverage through family medicine.
- To demonstrate comprehensive health care services as a concept of One Health which is attainable and achievable.

SUBJECTS INTEGRATED IN THE MODULE

1. Community Medicine
2. Family Health

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

COMMUNITY MEDICINE			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 44	
		DISCIPLINE	TOPIC
CMFH1-CM-001	Explain the development of Public Health in Pakistan.	Community Medicine	Health Systems in Pakistan
	Describe the Health Policy and planning in Pakistan.		
	Explain the background, concepts and progress made towards achieving "Health for all",		
	Describe the concepts and assess the progress of "Primary Health Care"		
	Describe the National Disease Control programs including policies, strategies and operations.		
	Analyze the roles Federal and Provincial Governments in managing Healthcare services in Pakistan		
	Discuss The District Health System, in the context of devolution. The Physician as a manager: Functions of manager management of material, human and financial resources.		
	Explain key principles of leadership and motivation in healthcare settings		
	Describe the collaboration between the public and private sectors in health care		
	Evaluate the role of Non-governmental Organizations and International Agencies.		
	Analyze the resources available for health.		
	Discuss the importance of community mobilization		
CMFH1-CM-002	Describe the background, concepts, uses and basic measurements of epidemiology (morbidity, mortality, disability and fatality)	Community Medicine	General Epidemiology and Research Methodology
	Describe the different epidemiological methods including descriptive, analytic and experimental approaches		
	Differentiate between association and causation		
	Outline the investigation of an outbreak or an epidemic.		
	Explain the principles and methods of disease screening		

	Conduct a community diagnosis and interpret its findings		and Screening
	Describe research and survey methodologies		
CMFH1-CM-003	Describe the composition of air	Community Medicine	Environmental Health Sciences
	Describe the causes of air pollution and methods of air purification		
	Explain the diseases caused by impurities in the air and their prevention		
	Identify the sources of water and understand daily water requirements		
	Analyze the causes of water pollution and methods for its prevention		
	Describe the process of water purification and water quality standards		
	Describe diseases caused by polluted water and their prevention		
	Explain the contents, hazards, and safety measures for the disposal of solid and liquid waste from domestic, industrial, and hospital sources Explain global and marine problems related to waste disposal.		
	Differentiate between climate and weather		
	Analyze global environmental concerns like greenhouse effect, depletion of Ozone layer and acid rains.		
	Explain the effects of extremes in temperature, humidity, and atmospheric pressure on human health, along with prevention methods.		
	Describe the sources, types, causes, hazards, and prevention of radiation exposure.		
	Explain the concepts of healthful housing and the challenges faced in urban and rural slums.		

	Define noise, its causes, acceptable levels, and the hazards and methods of control.		
CMFH1-CM-004	Differentiate between Infection, contamination, pollution, infestation.		Prevention and control of Infectious diseases
	Define the terminology of Infectious disease, communicable disease, contagious disease.		
	Define Host, Immune and susceptible persons.		
	Differentiate between Sporadic, Endemic, Epidemic, Pandemic, Epizootic, Exotic and Zoonotic.		
	Describe the roles of contact, fomites, carriers, insect vectors, and reservoirs of infection.		
	Describe the incubation period, infective period, and generation time.		
	Differentiate between cross infection, nosocomial infections, opportunistic infections, and iatrogenic disorders (Physician induced).		
	Explain the concepts of surveillance, control, eradication, and elimination.		
	Analyze the various modes of disease transmission.		
	Discuss the principles of disease prevention and control.		
	Describe the methods and types of disinfection.		
	Explain the concept of immunity.		
	Identify different immunizing agents.		
CMFH1-CM-005	Describe the concepts aims and approaches of IEC and approaches used in public health.	Community Medicine	Communication, information and health education
	Explain the contents, principles and stages of health education.		
	Explain the process, types, methods and barriers of communication.		
	Identify the role of health care provider in health education.		
	Describe the concept of social marketing and its' applications in health sector.		
	Conduct health education sessions.		

FAMILY MEDICINE			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15	
		DISCIPLINE	TOPIC
CMFH1-FM-001	List common causes of acute and chronic cough. Describe the systematic approach to a patient presenting with cough in OPD. Formulate a differential diagnosis based on history and examination. Identify appropriate baseline investigations. Outline initial management strategies. Identify indications for referral to specialty care.		Cough
CMFH1-FM-002	List common cardiac, respiratory, gastrointestinal, musculoskeletal, and psychological causes of chest pain. Describe a structured OPD approach to evaluating chest pain. Formulate a differential diagnosis using history, examination, and risk factors. Select appropriate baseline investigations (e.g., ECG, chest X-ray, lab tests). Outline initial management strategies, including urgent care if indicated. Identify criteria for referral to cardiology, pulmonology, or gastroenterology.		Chest Pain
CMFH1-FM-003	List common causes based on anatomical regions (upper, lower, right/left, generalized). Describe a systematic OPD assessment of a patient with abdominal pain. Formulate a differential diagnosis guided by history and physical findings. Select appropriate baseline investigations (e.g., CBC, LFTs, ultrasound). Outline initial management strategies including symptomatic relief.		Abdominal Pain

	Recognize indications for referral to surgery, gastroenterology, or other specialties.		
CMFH1-FM-004	List common causes of acute and chronic joint pain (inflammatory, degenerative, infectious, systemic). Describe an OPD approach for evaluating joint pain. Formulate a differential diagnosis using history, examination, and pattern of joint involvement. Identify relevant baseline investigations (e.g., CBC, ESR, CRP, X-rays). Outline initial management including analgesia and lifestyle advice. Recognize indications for referral to rheumatology, orthopedics, or physiotherapy.		Joint Pain

COMMUNITY VISIT			
COMMUNITY MEDICINE			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 36	
		DISCIPLINE	TOPIC
CMFH1-CM-007	Assess the appropriateness of location of a water purifying facility. Elaborate on the process of delivering and transporting water to a water treatment plant. Differentiate the critical aspects of water supply from various sources. Identify the physical and chemical characteristics of water. Determine the characteristics of the ingredients contained in water purification plants. Characterize infectious organisms and indicators. Explain how chemical compounds affect human health. Discuss the physical, chemical, and biological unit operations that are commonly encountered in treatment processes. Determine which rules, regulations, and guidelines that govern the selection of various water treatment processes at the local, national, and international levels. Highlight the requirement for surface water and some ground water treatment for drinking reasons. Describe the role of each treatment procedure in the treatment of drinking water. Outline a fundamental overview of technology selection. Evaluate the working of water treatment plants.	Community Medicine	Water purification plant/Water testing lab
CMFH1-CM-008	Identify working biomedical waste department Describe various types of biomedical waste & their disposal in hospital Explain with rationale about the waste management plan of their hospital	Community Medicine	Visit to hospital waste management

	Describe color coding scheme for various types of waste according to WHO Describe the various methods to dispose of waste, their advantages and disadvantages. Describe non risk waste and risk waste. Describe incineration working and cost analysis Describe storage site of waste at hospital		
CMFH1-CM-009	Describe the various physical, emotional and cognitive disabilities experienced by people who receive rehabilitation services and understand their functional limitations. Explain the medical & psychosocial impact of disabilities. Explain the impact of society's attitudes towards disabilities on the treatment of people with disabilities Evaluate the effect of physical, mental, gender, racial, cultural, and environmental factors on the lives of people with disabilities. Develop interaction skills to accommodate cultural sensitivity when working with consumers & their families. Explain the local context to familiarize the wide variety of generic and specialized community resources available to serve people with disabilities. Describe the major services provided in rehabilitation (e.g., rehabilitation counseling, vocational evaluation, adjustment services, job placement, physical restoration, environmental adaptations). Explain the role of the rehabilitation case manager in coordinating services for people with disabilities. Explain the local, state, and federal laws that affect rehabilitation services and the rights of people with disabilities. Explain the importance of advocacy (including self-advocacy) in the field of rehabilitation	Community Medicine	Visit to Rehabilitation center

	Discuss awareness and imparting skills to empower consumers to be active participants in their own rehabilitation plan. Critically appraise the ethical guidelines based on principles that encompass the rehabilitation field. Develop the verbal, written, and nonverbal communication skills necessary to work with people with disabilities, their families, and other service providers. Develop basic rehabilitation service delivery skills Describe the rehabilitation process and techniques used to evaluate eligibility for services, assess consumers to identify employment and independent living options, develop appropriate treatment plans, and provide follow-up Explain the similarities and differences among public, private not-for-profit, and private-for-profit rehabilitation practice. Discuss the community-based employment options for individuals with disabilities Identify the social, political, economic, and legal issues pertinent to an aging society and rehabilitation Develop the knowledge and skills pertinent to the procedures and programs provided to people with developmental disabilities. Develop the knowledge and skills pertinent to the procedures and programs provided to people with psychiatric disabilities. Develop the knowledge and skills to train, supervise, and evaluate employees who are providing direct care to consumers. Discuss the professional organizations, professional journals, and job opportunities in the field of rehabilitation. Discuss the integration of biological, physical, behavioral, and clinical sciences into physical therapy services		

	Exhibit professional conduct and behaviors that are consistent with the legal and ethical practice of physical therapy. Demonstrate compassion, care, integrity, and respect for differences, values, and preferences in all interactions with patients/clients, family members, health care providers, students, other consumers, and payers. Screen patients/clients to determine if they are candidates for physical therapy services or if a referral to, or consultation with, another health care professional or agency is warranted. Complete a patient/client examination/re-examination and evaluate and interpret the examination data to determine a physical therapy diagnosis and prognosis Employ critical thinking, self-reflection, and evidence-based practice to make clinical decisions about physical therapy services. Collaborate with patients/clients, caregivers, and other health care providers to develop and implement an evidence- based plan of care that coordinates human and financial resources. Critically appraise the services and information related to health promotion, fitness, wellness, health risks, and disease prevention within the scope of physical therapy practices and rehabilitation		
CMFH1-CM-010	Apply 5 levels of prevention for diseases of public health importance. Design and implement community-based Health education and promotion projects. Collect, organize, analyze, interpret and disseminate data of disease burden in community and present report	Community Medicine	Visit to BHU & RHCs

CMFH1-CM-011	House hold survey of 10 houses. Data collection and report writing	Community Medicine	Acquired community in vicinity of Medical College

Practicals

PRACTICAL

COMMUNITY MEDICINE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
CMFH1-CM-006	Assess the application of standards and KPIs in hospital lab settings and Blood banks	Pathology	MSDS Standards
	Assess the application of standards and Quality assurance indicators for imaging services	Radiology	
	Assess the application of standards and Quality assurance indicators for emergency services	Emergency and traumatology	
	Assess the application of standards and Quality assurance indicators for high-risk obstetrical services	Gynae & Obs	
	Assess the application of standards and Quality assurance indicators for anesthetic services	Anesthesia	
	Assess the application of standards and Quality assurance indicators for surgical procedures	Surgery and Allied	
	Assess the application of standards and Quality assurance indicators for prescription and dispensing and administration of the drugs	Working Pharmacies	
	Assess the application of standards and Quality assurance indicators for patients' rights and education	Medical and Surgical OPDS	
	Collect data and transform into a report with recommendations	Community Medicine	

Total Weeks	Total Hours
03	105

Modular Integrated Curriculum 2K23

MBBS Year – 3

MODULE-23

Forensic Medicine & Toxicology-III

POLICE LINE - DO NOT CROSS

MODULE RATIONALE

This module prepares the 3rd year MBBS students for the real-world challenges of crime scene investigation, medico-legal frameworks of Pakistan, and dealing with cases of poisoning. This module is critical in developing a holistic understanding of the intersection of the medical profession and law.

MODULE OUTCOMES

- Describe different types of Laws
- Define legal terms relevant to medical practice and explain procedures in the courts of law
- Explain legal aspects of medical practice
- Discuss the principles and methods of crime scene investigations
- Describe different analytical techniques to diagnose the nature of poison/drugs

SUBJECTS INTEGRATED IN THE MODULE

1. Pathology
2. Pharmacology
3. Behavioral Sciences

IMPLEMENTATION TORs
• 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.

Syllabus

Theory

THEORY			
LAW			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 05	
		INTEGRATING DISCIPLINE	TOPIC
For3-L-001	Define and describe different types of law.	Forensic Medicine	Law
For3-L-002	Describe different levels of courts of Pakistan and their judicial powers.		Hierarchy of courts and their judicial powers
For3-L-003	Define different legal terms. Understand legal procedures and its presentation in the courts		Legal Terms and Procedures
For3-L-004	Define and describe types of evidence Describe the stages of presentation of evidence in the court of law. Explain the types of witness and its presentation in the court Differentiate between dying deposition and declaration.		Evidence

For3-L-005	Describe general presumptions and exemptions in law to fix the criminal responsibility Define insanity, immaturity and intoxication. Define illusions, delusions and hallucinations and their types and medico legal significance. Differentiate between true and feigned insanity. Reproduce different sections of PPC dealing with these factors. Describe Mc Naughtan's rule, Durham,s rule to test the criminal responsibility. Outline the fate of criminal responsibility- Unfit to plead, Diminished responsibility State testamentary capacity.		Forensic psychiatry and Criminal Responsibility
For3-L-006	Define consent; describe its types and its role in medical treatment, consent & its legal basis. Differentiate between valid and invalid consent. Outline standard procedure of informed consent. Explain the informed consent procedure from a patient before undergoing a major surgical procedure. Explain the consent protocol of a minor. Prepare a blanket consent form. Apply modified procedure of consent taking in special Circumstances.	Forensic medicine & Behavioral sciences	Consent
For3-L-007	Define medical bioethics. Describe principles of ethics. Explain different codes of medical ethics Reproduce duties of doctor towards patients, society and state. Outline the factors responsible for the deterioration of ethical values in medical practice.		Doctor patient relationship

For3-L-008	Explain professional misconduct and its different types. Describe professional secrecy, privileged communication, medico legal significance of medical records.		Professional misconduct
For3-L-009	Differentiate between professional misconduct and professional negligence. Describe different types of professional negligence. Establish the extent of damage to patient in medical practice. Outline the laws dealing with negligence.		Professional Negligence
For3-L-010	Describe composition of PMDC Explain functions of body-supervision of standards of proficiency, maintenance of register, disciplinary powers. Compare composition of PMDC and PMC ACT 2020 Describe objective of ALLOPATHIC SYSTEM 1962 Outline Medical and Dental Degree Ordinance 1982. Explain relevant sections of Drug act 1976 and subsequent Amendments. Write Dangerous drug act 1930 and their different sections and rules.	Forensic Medicine	Laws dealing with medical practice

For3-L-011	Describe sections2,4,5 and 6 of Hadood Ordinance 1979 Explain natural & un-natural sexual offences Reproduce criteria of legal marriage and dissolution of marriage.		Laws dealing with sexual offences Hadood Ordinance 1979, Women Protection Act 2006 Legal aspects of marriage, Muslim family law ordinance 1961.
For3-L-012	Define different terms used in the Qisas and Diyat Act relevant to hurt and Qatl Classify hurt and its subtypes as per Qisas and Diyat Act 1997 Classify QATL and its subtypes. Describe ISQAT-E-HAML AND ISQAT-E-JANIN.		Law relevant to Hurtand killings Qisas and Diyat Act 1997
For3-L-013	Understand Mental Health Act 2001 Describe the composition and functions of the FEDERAL MENTAL HEALTH AUTHORITY. SEC 3 Explain composition and functions of BOARD OF VISITORS.SEC 4 Reproduce duration for period of detention for assessment, treatment, urgent admission and emergency holding.SEC 9 Outline the procedure of admission of the patient in the psychiatric centre. SEC 10,11 Explain holding of mentally disordered persons wandering in public places. SECT19 Write the procedure of discharge from psychiatric centre SEC 20	Forensic Medicine	Law relevant to mental health

For3-L-014	Define child abuse Explain epidemiology Describe clinical features Diagnose a case of child abuse. Reproduce medico legal significance. Apply the knowledge to relevant situation for problem-solving	Forensic Medicine	Laws relevant to Domestic violence Child abuse,
For3-L-015	Describe the provisions for medical aid and treatment of injured persons to save their lives and protect their health during emergency. Describe the concept of the ancient law of torts		Injured Person (Medical Aid) Act 2004
			Workman Compensation Act 1923 Employee social security ordinance 1965
For3-L-016	Diagnose the injuries causing disablement and percentage loss of earning capacity.		
For3-L-017	Discuss the Health Commission Act		Health Commission Act
For3-L-018	Describe the Consumers Protection Act in relation to Forensic Medicine		Consumers Protection Act
For3-L-019	Define and classify euthanasia.		Euthanasia
	Describe different progonist and antagonist views.		
	Reproduce global laws relevant to euthanasia.		
	Discuss ethical and moral issues.		

For3-L-020	Define and classify suicide. Describe different views about suicide in society. Elaborate high risks groups. Explain different methods used Reproduce preventive measures. Discuss moral and ethical issues. Explain the psychopathology of suicide	Forensic Medicine	Suicide

GENERAL TOXICOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		INTEGRATING DISCIPLINE	TOPIC
For3-Tox-001	Enlist & define various branches of Toxicology Define terms like drug, poison, dose, acute and chronic poisoning. Explain the therapeutic index and toxicity rating scale Quote and cite characteristics of homicidal, suicidal, and accidental poisons in home and environment Describe preventive measures of such poisonings	Forensic Medicine & Chemical Pathology	General Toxicology
For3-Tox-002	Differentiate between Drug and Poison Classify different poisons according to their mode of action Enumerate legal classification of poisons		Classification of Poisons
For3-Tox-003	Describe routes of absorption, sites of metabolism and routes of excretion of poisons Enlist and describe different factors that modify the patient's response to a toxic agent.		Factors affecting the absorption of poison
For3-Tox-004	Enlist the clinical, ethical & statutory duties of a doctor while managing a case of poisoning.		Duties of doctor

	Collection, preservation, storage and dispatch of samples for toxicological analysis		
For3-Tox-005	Diagnose a case of poisoning in living Enlist various bed side tests used for diagnosis of poisoning Interpret post-mortem findings in a suspected case of poisoning		Diagnosis of a Poisoning case
For3-Tox-006	Apply general principles in treatment of poisoning cases Prescribe general treatment measures to poisoning cases Briefly describe the procedures to remove the unabsorbed poisons from the body Describe the procedure of Gastric lavage Enlist complications of Gastric Lavage Enumerate contra indications of gastric lavage procedure Describe the role of Activated Charcoal in poisoning patient Enlist indications & contraindications of administering cathartics in poisoning cases Classify antidotes according to their mode of action Define & classify Chelators Enlist properties of ideal chelating agents Enlist &briefly describe the methods of removal of absorbed poisons from the body		Treatment of a poisoned patient
For3-Tox-007	Enlist medico-legal implications of poisoning cases Comprehend different laws relating to poisons & drugs Enlist important relevant points of Rule 8, Rule 13 & Rule 14 of the Dangerous Drug Act 1930 Enlist WHO recommendations being incorporated in the Drug act 1976 Enlist the WHO criteria for Drug Dependence Define National Formulary		Laws related to Drugs & poisons

For3-Tox-008	Explain, observe/perform the following analytical techniques: Spectrophotometric: Calorimetric Fluorometric Automation. Chromatographic: Thin layer chromatography (TLC). Gas liquid chromatography (GLC). High pressure liquid chromatography (HPLC). Gas liquid mass spectrometry (GL-MS). Competitive binding assay or immunoreactive assay: Radioimmunoassay (RIA). Enzyme immunoassay (EIA). Fluorescent Polarization immunoassay (FPIA). Immunoturbidimetric assay.		Analytical techniques

SPECIAL TOXICOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 09	
		INTEGRATING DISCIPLINE	TOPIC
For3-Tox-009	Classify corrosive poisons. Describe sources, physical and chemical properties. Explain mechanism of action. Write the fatal dose and fatal period. Describe the clinical features of the poison. Manage the patient clinically. Explain the autopsy findings. Describe medico-legal aspects. Define Vitriol age. Apply the relevant section of qisas and diyat act to the hurt caused by the poison.	Forensic medicine & medicine	Corrosives Mineral acids- Sulfuric acid Nitric acid Hydrochloric acid Strong alkalis
For3-Tox-010	Classify corrosive poisons. Describe sources, physical and chemical properties. Explain mechanism of action.		Organic acid – Oxalic acid, Carbolic acid, Hydrocyanic acid

	Write the fatal dose and fatal period. Describe the clinical features of the poison. Manage the patient clinically. Explain the autopsy findings. Describe medicolegal aspects.		
For3-Tox-011	Classify snakes Differentiate between poisonous and non-poisonous snakes. Tabulate the differences between the elapids and vipers. Discuss the characteristics of snake venom. Describe the clinical feature of venomous snake bite. Explain clinical management of venomous snake bite. Discuss postmortem features and medico legal aspects of venomous snake bite.	Forensic medicine & medicine	Irritant Poisons Snakes- Elapids Vipers Hydrophidate or sea-snakes
For3-Tox-012	Describe the sources, properties, routes of absorption of the poison. Describe the fatal dose, clinical features of the poison. Outline the clinical management of such case. Enlist the samples to be collected, preserved and sent to chemical examiner for its detection. State the postmortem appearances of the poison. Explain the medico legal aspects of acute poisoning of the poison. Describe the clinical features of chronic poisoning of the poison. Explain the laboratory investigations to establish the diagnosis. Summarize the clinical management of a case of poisoning with irritant poisons Describe post mortem findings. Describe post mortem findings. Discuss medico legal aspects of chronic poisoning.	Forensic medicine & medicine	Irritant Metallic poisons – (Inorganic metallic origin- Arsenic, Mercury, Lead, Copper Nonmetallic irritant poisons- Phosphorus
For3-Tox-013	Classify pesticides. Classify organophosphates.		Agricultural poisons –

	Describe the sources of exposure, mechanism of action and fatal dose and fatal period Explain clinical features of poisoning Summarize laboratory investigations and bed side test to confirm the diagnosis. Enlist the samples to be collected and sent to the chemical examiner. Outline the clinical management. Reproduce the autopsy findings. Discuss the medico legal aspects.		Organophosphates, Carbamates, Chlorinated Hydrocarbon, Endrin Paraquet Aluminium Phosphide
For3-Tox-014	Describe physical and chemical properties of the poison Describe different preparations of Cannabis Explain clinical features in acute and chronic poisoning, fatal dose and fatal period. Outline the clinical management of the poison. Enlist the samples to be collected and sent to the chemical examiner. Describe autopsy findings of the case. Explain the difference between the seeds of Dhatura and chilli. Outline medico legal aspects of acute and chronic poisoning.	Forensic medicine & medicine	Deleriant Poisons – Dhatura Canabis Sativa
For3-Tox-015	Classify barbiturates. Mention fatal dose and fatal period. Describe clinical features. Explain clinical management. Describe autopsy findings. Reproduce medico legal importance.	Pharmacology	Sedatives and Hypnotics – Barbiturates
For3-Tox-016	Classify alkaloids of opium. Mention the fatal dose and fatal period. Describe clinical features in acute and chronic poisoning. Describe the differential diagnosis of opium coma. List laboratory investigations and bedside test.		Somniferous / Narcotics– (Opium - Morphine, Heroine Drugs of dependence

	Explain clinical management. Explain autopsy findings Reproduce medico legal aspects Define drug dependence. Differentiate between drug dependence and drug habituation. Enlist drugs Describe criteria of drug dependence as per WHO criteria. of dependence.		
For3-Tox-017	Define Alcohols Describe different alcohol beverages with different alcohol concentrations. Explain toxicokinetic of alcohols Describe clinical features of acute ethyl alcohol poison. Correlate different clinical features with different BAC. Outline clinical management of poisoning Describe the laboratory investigation and samples to be sent to the chemical examiner. Describe protocol of examination of a drunken person. Describe autopsy findings. Explain medicolegal aspects. Describe clinical features of alcoholism. Explain clinical features of methanol toxicity Describe autopsy findings Explain medicolegal aspects of methanol poisoning.		Inebriants – Ethyl Alcohol / Methanol,
For3-Tox-018	Describe the sources of exposure of asphyxiant gases. State the mechanism of action. Explain clinical features of poisoning. Outline clinical management of cases of poisoning. Enlist samples to be collected and sent to chemical examiner. Outline autopsy features Explain medico legal aspects of acute poisoning of asphyxiants gases.	Forensic Medicine	Asphyxiant Gases - Carbon Mono oxide, Hydrogen Sulphide, Carbon Dioxide

For3-Tox-019	Describe source of exposure Explain methods of inhalation. Describe clinical features List the diagnostic findings on X rays chest. Explain clinical management Discuss autopsy findings Outline medico legal aspects of acute poisoning.		CNS Stimulant – Cocaine Amphetamine Methyl phenidate (ritalin) Hallucinogens-LSD,MESCALINE,PHENCYCLIDINE Tricyclic anti depressants - Sheesha (Nicotine + Fruits & Herbal Flavors & Coal
For3-Tox-020	Describe source of exposure Explain methods of inhalation. Reproduce clinical features List the diagnostic findings on X rays chest. Explain clinical management Discuss autopsy findings Outline medico legal aspects of acute poisoning	Forensic Medicine	Hydrocarbons--kerosene oil, Volatile substance abuse Glue sniffing Sniffling Huffed Bagged
For3-Tox-021	Describe source of exposure Describe clinical features List the diagnostic findings Explain clinical management Discuss autopsy findings Outline medico legal aspects of acute poisoning.		Black stone Paraphenylene diamine (PPD)

FORENSIC SEROLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		INTEGRATING DISCIPLINE	TOPIC
For3-FS-001	Define Forensic Serology Describe the Medico-legal importance of Forensic Serology	Forensic Medicine	Definition &medico-legal importance of

			Forensic Serology
For3-FS-002	Define Trace Evidence Classify Trace Evidence Describe Locard's Exchange Principle		Trace Evidence
For3-FS-003	Describe the protocol of scientific study (identification, collection, preservation, storage, labeling and transport to the concerned quarter) of trace evidentiary material.		Scientific study of trace evidentiary material
For3-FS-004	Enlist the medico-legal importance of different biological fluids & stains	Forensic Medicine	Biological fluids
For3-FS-005	Outline principles of chain of custody and its medico-legal significance		chain of custody
For3-FS-006	Describe the principles of chemical & physiochemical tests to determine the presence of blood in suspected stains Interpret the physical characteristics of a blood stain Describe the procedure of examination of blood stain comprising of physical, chemical, physiochemical & confirmatory tests Discuss the principle & importance of spectroscopic analysis of blood in the stain Describe microscopic, Immunological & enzymological methods for species determination of blood stain Explain different blood group systems Describe medico-legal importance of blood grouping Interpret the phenotype & genotype of different ABO blood groups	Pathology	Blood
For3-FS-007	Describe the scheme for examination of Seminal stain including physical, chemical, microscopic & serological tests including DNA Analysis.	Forensic Medicine	Semen
	Describe the Medico-legal importance of seminal stain		

For3-FS-008	Describe the physical, chemical, serological & microscopic examination of hair Compare & contrast human and animal hair& hair like Structures as fibers. Enlist the Medico-legal significance of hair		Hair
For3-FS-009	Enumerate the tests for determination of other body fluids like Milk, saliva, urine, fecal matter Describe their medico-legal significance		Body Fluids
For3-FS-010	Explain the Structure of DNA. Describe DNA fingerprinting methods Outline the samples needed for DNA profiling, their collection, preservation, storage and dispatch to the analyst. Explain National DNA databank (CODIS). Discuss Ethical Issues relevant to DNA.		DNA

FORENSIC SCIENCES

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		INTEGRATING DISCIPLINE	TOPIC
For3-FSc-001	Describe search patterns of scene of crime. Photograph the area/object of interest from scene of crime. Examine, collect, preserve and dispatch trace evidence and record his findings at scene of crime. Identify the stains of different biological fluids, collect, preserve, dispatch and record his findings Explain and demonstrate screening, chemical and microscopic analysis of biological stains. Describe forensic analysis of DNA.	Forensic medicine	Principles and methods of crime scene investigation

For3-FSc-002	Describe the examination of firearm and tool mark evidence	Forensic medicine	Examination of firearm and tool mark evidence
For3-FSc-003	Explain the examination of broken glass		Examination of broken glass

Practicals

PRACTICAL / LAB WORK

LAW

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
For3-L-021	Demonstrate legal procedures and its presentation in the courts	Forensic Medicine	Legal Terms and Procedures
For3-L-022	Demonstrate presentation of different stages of evidence in the court of law.		Evidence
	Distinguish between different types of witness and its presentation in the court		
For3-L-023	Demonstrate the recording of dying deposition and dying declaration step wise.		Dying deposition and declaration

GENERAL TOXICOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 03	
		INTEGRATING DISCIPLINE	TOPIC
For3-Tox-022	Assess a suspected patient of poisoning Collect, preserve & dispatch the routine viscera of a suspected poisoning case sent to chemical examiner Demonstrate the procedure of gastric lavage on a mannequin	Forensic Medicine	Poisoning

SPECIAL TOXICOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		INTEGRATING DISCIPLINE	TOPIC
For3-Tox-023	Identify corrosive poisons. Describe identifying features. Identify autopsy features of H2SO4 and HNO3 Apply the relevant section of qisas and diyat act to the hurt caused by the poison	Forensic Medicine	Mineral acids- Sulfuric acid Nitric acid Hydrochloric acid Strong alkalis

For3-Tox-024	Identify organic acid corrosive poisons Describe identifying features. Explain laboratory investigations Recognize autopsy findings.	Forensic Medicine	Organic acid – Oxalic acid, Carbolic acid, Hydrocyanic acid
For3-Tox-025	Label salient differentiating features of poisonous and non-Poisonous snakes. Identify snake bite wound. Apply the tourniquet above the site of bite of a patient.	Forensic Medicine	Irritant Animal Poisons (Snakes-Elapids Vipers Hydrophidate or sea-snakes
For3-Tox-026	Identify poison. Describe identifying features. Identify features of chronic arsenic poisoning Identify chronic lead poisoning on x rays Identify chronic lead poisoning (basophilic stippling) on blood cell slide. Collect samples to be sent to the chemical examiner.	Forensic Medicine	Irritant Metallic poisons – (Inorganic metallic origin- Arsenic, Mercury, Lead, Copper Nonmetallic irritant poisons- Phosphorus
For3-Tox-027	Diagnose a case of insecticide poisoning Explain laboratory investigations Manage a case of insecticide poisoning Identify autopsy features Collect, preserve and dispatch the specimens to chemical examiner Perform bedside test for certain pesticides (aluminium phosphide	Forensic Medicine	Agricultural poisons – Organophosphates, Carbamates Chlorinated Hydrocarbon, Endrin Paraquet Aluminum Phosphide
For3-Tox-028	Identify the poison Describe identifying features Diagnose a case of deliriant poisoning Explain lab investigation Manage the case Identify autopsy features	Forensic Medicine	Deliriant Poisons – Dhatura Canabis Sativa

	Collect, preserve and dispatch the specimens to chemical examiner		
For3-Tox-029	Diagnose a case of sedatives / hypnotic's toxicity Explain lab investigation Manage the case Identify autopsy features Collect, preserve and dispatch the specimens to chemical examiner	Forensic Medicine	Sedatives and Hypnotics – Barbiturates
For3-Tox-030	Identify the poison (Opium / Poppy capsule) Describe identifying features Diagnose a case of narcotic poisoning Perform bedside test Explain lab investigations Recognize autopsy features Collect, preserve and dispatch the specimens to chemical examiner	Forensic Medicine	Somniferous / Narcotics– (Opium - Morphine, Heroine Drugs of dependence
For3-Tox-031	Diagnose a case of Acute alcohol Toxicity (Ethanol / Methanol) Explain lab investigations Manage the case Conduct examination of a case of ethyl alcohol toxicity and certify findings with opinion Collect appropriate samples Recognize autopsy features Collect, preserve and dispatch the specimens to chemical examiner	Forensic Medicine	Inebriants – Ethyl Alcohol / Methanol,
For3-Tox-032	Diagnose a case of Asphyxiant gases Explain lab investigations Manage the case Recognize autopsy features Collect, preserve and dispatch the specimens to chemical examiner	Forensic Medicine	Asphyxiant Gases - Carbon Mono oxide, Hydrogen Sulphide, Carbon Dioxide
For3-Tox-033	Identify the poison Describe identifying features	Forensic Medicine	CNS Stimulant – Cocaine

	Diagnose the case Explain lab investigation Manage the case Recognize autopsy features Collect, preserve and dispatch the specimens to chemical examiner		Amphetamine Methyl phenidate (ritalin) Hallucinogens-LSD, MESCALINE, PHEN CYCLIDINE Tricyclic anti depressants - Sheesha (Nicotine + Fruits & Herbal Flavors & Coal)
For3-Tox-034	Identify the poison Diagnose the case Explain lab investigation Manage the case Recognize autopsy features Collect, preserve, and dispatch the specimens to the chemical examiner	Forensic Medicine	Hydrocarbons----- kerosene oil - Volatile substance abuse - Glue sniffing - Sniffling - Huffed - Bagged
For3-Tox-035	Identify the poison Diagnose the case Explain lab investigation Manage the case Recognize autopsy features Collect, preserve, and dispatch the specimens to the chemical examiner	Forensic Medicine	Black stone Paraphenylene diamine (PPD)

FORENSIC SEROLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 06	
		INTEGRATING DISCIPLINE	TOPIC
For3-FS-011	Categorize different trace evidence to Biological & Non-biological sources	Forensic Medicine	Trace evidence

For3-FS-012	Identify, collect, preserve, label and dispatch trace evidentiary material to the concerned quarters.		The scientific study of trace evidentiary material
For3-FS-013	Interpret the physical characteristic of a suspected blood stain with naked eye & under UV lamp		Bloodstain
For3-FS-014	Preserve & seal the clothes with suspected blood/seminal stain	Forensic Medicine	Cloth examination
For3-FS-015	Perform Screening tests (Benzedine & Phenolphethein/Kastle Mayer) on suspected blood stain		Blood stain
	Identify the Takayama (Haemochoromogen) & Teichmann (Haemin) Crystals under the microscope		
	Identify different absorption bands of hemoglobin & its derivatives with spectroscope		
	Perform forward & reverse blood grouping techniques & interpret the results		
	Differentiate various species (human, hen, goat and camel) with the help of microscopic examination of RBCs		
For3-FS-016	Identify & confirm the presence of semen with the help of microscopic examination		Semen
For3-FS-017	Prepare the slide of hair & Differentiate Human & Animal Hair under the microscope		Hair
	Differentiate human/animal hair from cotton fiber, polyester fiber		

Total Weeks	Total Hours
1.5	40

03
Section

Table of Specifications (ToS)

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

MBBS 3rd Professional						
Block-8						
Subject	**Written Exam**		**Oral/Practical/Clinical Exam**			
	MCQ (1 mark)	**Marks**	**OSPE /OSCE (8 marks each observed)**	**OSCE (10 marks each observed)**	**OSVE (14 marks each observed)**	**Marks**
Pharmacology	22	22	03	-	01	38
Pathology	55	55	04	-	02	60
Community Medicine	04	04	-	-	-	-
Surgery	20	20	01	-	-	08
Medicine	20	20	01	-	-	08
Forensic	15	15	01	-	-	08
Behavioral	02	02	-	-	-	-
Patient Safety	02	02	-	-	-	-
CFRC	-	-	01	-	-	08
PERLs + ExposITory	-	-	-	01	-	10
Total	**140**	**140**	**11 stations x 08 = 88**	**01 stations x 10 = 10**	**03 stations x 14=42**	**140**

MBBS 3rd Professional

Block-9

Subject	Written Exam		Oral/Practical/Clinical Exam			
	MCQ (1 mark)	Marks	OSPE /OSCE (8 marks each observed)	OSCE (10 marks each observed)	OSVE (14 marks each observed)	Marks
Pharmacology	19	19	02	-	01	30
Pathology	22	22	02	-	-	16
Family Medicine	05	05	-	-	-	-
Community Medicine	42	42	03	-	01	38
Surgery	15	15	-	-	-	-
Medicine	15	15	01	-	-	08
Forensic	20	20	02	-	01	30
Behavioral Sciences	02	02	-	-	-	-
Patient Safety	-	-	-	-	-	-
CFRC	-	-	01	-	-	08
PERLs + ExposITory	-	-	-	01	-	10
Total	**140**	**140**	**11 stations x 08 = 88**	**01 stations x 10 = 10**	**03 stations x 14=42**	**140**

04
Section

VOLUME:03

C-FRC

CLINICAL-FOUNDATION ROTATION CLERKSHIPS

UNIVERSITY OF HEALTH SCIENCES LAHORE

Modular Integrated Curriculum 2K23

YEAR-03

UNIVERSITY OF HEALTH SCIENCES LAHORE
UHS
Clerkships
Rotation
Foundation
Clinical Skills
-FRC
C-FRC-03
YEAR-03
Clinical Rotations

GUIDELINES FOR DEVELOPING CFRC 3rd YEAR

University of Health Sciences has designed a very detailed and comprehensive CFRC- Logbook document which provides a proper guideline for all the institutions to design and implement the logbooks for Clinical rotations as these log books will be assessed in Annual Examination. For reference **"Modular Integrated Curriculum 2K23 Final Version, Volume: 1 & Volume: 2" at UHS official website: Downloads/Syllabus MBBS /BDS (https://www.uhs.edu.pk/Downloadslink.php).**

C-FRC IMPLEMENTATION

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 2K23 version 3.0.

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.

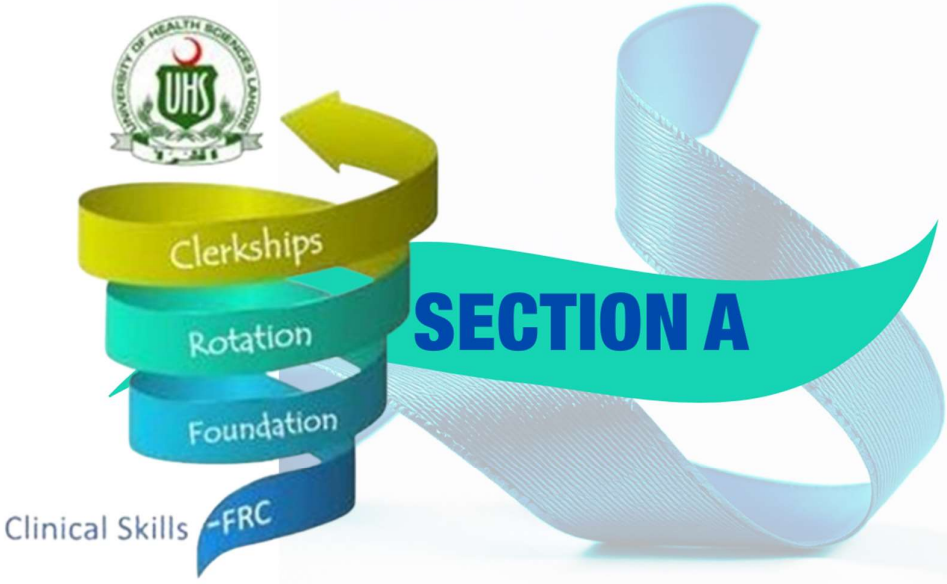
The spiral of the C-FRC has the core concept that the student's skill acquisition should be aligned for better outcomes as they proceed to the clerkship year. The utilization of the allotted hours by PMDC and UHS should be utilized in an effective manner, maximizing the utility of the available resources. 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.



SECTION A

BLOCK-07

BLOCK-07	
CFRC Code	**Task/Skill**
CFRC3-001	**Medical History taking skills** **Take focused medical history** including presenting complaints, history of presenting illness, past medical and surgical history, drug and allergy history, family history, social history, and systems review to identify symptoms, risk factors, and relevant clinical information.
CFRC3-002	**General physical examination:** **Perform** a systematic general physical examination to assess vital signs and abnormal clinical findings.
CFRC3-003	**Assessment of Growth and Nutritional Status** **Measure** BMI and interpret nutritional status. **Record** height, weight, and calculate growth percentiles in OPD/community settings.
CFRC3-004	**Anemia** **Identify** signs of anemia (pallor, koilonychia, glossitis) during examination.
CFRC3-005	**Blood sampling technique** **Observe and narrate** the correct technique for collecting, labeling, and storing blood samples while maintaining aseptic precautions and ensuring specimen integrity. *(see annexure 1)*
CFRC3-006	**CBC Analysis** **Interpret** CBC and peripheral smear findings. **Differentiate** microcytic, macrocytic, and hemolytic anemia patterns on reports.
CFRC3-007	**Coagulation profile analysis** **Interpret** PT, APTT, and platelet count results. **Identify** clinical signs of bleeding disorders (petechiae, ecchymoses).
CFRC3-008	**Blood transfusion** **Demonstrate** correct patient identification and crossmatch verification before blood transfusion. **Observe and describe** steps of blood transfusion setup. **Document** blood transfusion record.
CFRC3-009	**WHO Death certificate** **Fill out** a WHO death certificate based on case data.
CFRC3-010	**Informed consent** **Take** informed written consent for common procedures.
CFRC3-011	**Communication skills** **Demonstrate** empathetic communication during patient interaction.

CFRC3-012	**Wound Assessment** **Inspect and describe** the physical appearance of a wound, including its size, shape, edges, wound bed characteristics, exudate, surrounding skin, and signs of infection. **Identify** signs of wound infection.
CFRC3-013	**Wound dressing** **Assist** in wound dressing using sterile technique.
CFRC3-014	**Burn wound care** **Observe and narrate** the initial management steps for a burn patient (cooling, covering, fluids). **Counsel** on burn wound care and infection prevention.
CFRC3-015	**Assessment of hemorrhage** **Measure and interpret** vital signs in suspected shock. **Identify** signs of external/internal bleeding. Initiate first aid management for hemorrhage.
CFRC3-016	**Infection prevention & management** **Demonstrate** isolation precautions and hand hygiene. **Counsel** patients on infection prevention and immunization. **Monitor** fever charts and **interpret** temperature trends. **Observe** antibiotic administration and IV fluid therapy.
CFRC3-017	**Routes of drug administration:** **Observe and identify** various routes of drug administration (oral, intravenous, intramuscular, subcutaneous, inhalational, topical, and rectal) and **describe** the rationale for selecting a specific route for drug administration.
CFRC3-018	**Aseptic precautions in parenteral drug administration:** **Demonstrate and practice** aseptic precautions during parenteral drug administration. *(hand hygiene, use of sterile equipment, skin antisepsis, wearing gloves, avoiding contamination of sterile parts, clean environment, verifying drug integrity, single-use of syringes/needles, safe disposal of sharps, applying sterile dressing).*
CFRC3-019	**Scrubbing technique** **Perform** the correct technique of scrubbing in for surgical procedures in operation theatre while adhering to aseptic principles and infection control protocols.
CFRC3-020	**Surgical History taking**

	Perform focused surgical history-taking (e.g., neck lump, trauma, abdominal pain) and conduct physical examination to identify key findings for diagnosis and management.
CFRC3-021	**Suturing** **Observe** the steps of basic suturing techniques, including instrument handling, knot tying, and wound edge approximation, while following principles of asepsis.
CFRC3-022	**Post-surgical infections** **Observe** appropriate antimicrobial prophylaxis by selecting and justifying pre-operative antibiotics, and management of post-surgical infections according to standard guidelines.

Note: Before signing the logbook entry, the DME/HOD will ensure that the skill/task has been achieved by the student.

Annexure I

Collection, Transport and Storage of Blood Culture Specimen

Learning Outcomes:

The students will be able to:

- Explain the role of blood cultures in diagnosing bloodstream infections (e.g., sepsis, endocarditis).
- Describe the clinical significance of accurate and timely blood culture collection.
- Identify the correct site for collection of blood culture specimen
- Describe aseptic technique to minimize contamination.
- Determine the appropriate blood volume required for adult and pediatric patients.
- Differentiate between aerobic and anaerobic culture bottles and their use.
- Timely collection of specimens (before antibiotic administration, during fever spikes if possible).
- Demonstrate hand hygiene and use of proper disinfection procedure for collection.
- Dispose of sharp and biohazard materials safely.
- Label specimens clearly with patient Name, date, and time of collection.
- Complete relevant laboratory request forms or electronic documentation accurately.
- Describe appropriate transport conditions (Room temperature & prompt delivery).
- Understand the acceptable timeframe for transporting specimens to the lab (ideally within 2 hours).
- Explain the impact of delays or incorrect transport on culture results.
- State the maximum holding times and conditions for blood culture bottles (e.g., room temperature vs. refrigeration).
- Recognize how improper storage can affect microbial recovery and lead to false-negative results.
- List of common pre-analytical errors (e.g., contamination, insufficient volume).

Collection of Blood Culture Specimen:

Blood should be collected before antimicrobial treatment has started. When the patient has recurring fever, collect the blood as the temperature begins to rise. For other patients, collect the blood as soon as possible after receiving the request. To increase the chances of isolating a
pathogen, it is usually recommended that at least two specimens (collected at different times) should be cultured. A strict aseptic technique must be used to collect the blood

Procedure for collection of Specimen for Blood Culture:

Blood for culture must be collected and dispensed with great care to avoid contaminating the specimen and culture medium.

- Using a pressure cuff, locate a suitable vein in the arm. Deflate the cuff while disinfecting the venepuncture site. Wearing gloves thoroughly disinfect the venipuncture site as follows:
- Palpate the Vein with Your Index or Middle Finger
- Using 70% ethanol, cleanse an area of about 50 mm in diameter.
- Allow to air-dry.
- Using 2% tincture of iodine and a circular action, swab the area beginning at the point where the needle will enter the vein.
- Allow the iodine to dry on the skin for at least 1 minute.
- Once the area has been disinfected, never touch the venipuncture area.
- Lift back the tape or remove the protective cover from the top of the culture bottle(s). Wipe the top of the bottle using an ethanol swab.
- Using a sterile syringe and needle, withdraw about 5-10 ml of blood from an adult or about 1-3 ml for paediatric patients.
- Insert the needle through the rubber liner of the bottle cap and dispense the blood into the blood culture bottle containing 40-50ml of the broth.
- Clearly label each bottle with the name and number of the patient, and the date and time of collection.

Transport & Storage of Specimen to Microbiology laboratory:

- Timely and proper transport of specimen to the laboratory is crucial for accurate diagnosis and recovery of any microorganisms present.

- Blood culture bottles should be transported to the microbiology laboratory as soon as possible, ideally within **30 minutes to 2 hours** after collection, if not possible keep the bottles at Room temperature **(20–25°C)**.
- Blood culture bottles "**must not be refrigerated"**. Most organisms of clinical importance may become non-viable or fail to grow if exposed to cold temperatures. Keep at **room temperature (20–25°C)**.
- Transport the bottles in an **upright position** to minimize the risk of leakage or contamination
- Place the blood culture bottles in a designated **biohazard specimen transport bag** with a separate pouch for laboratory request forms. The container should be **leak-proof.**

Precautions:

- Do not shake the blood culture bottles.
- Do not stack or crush bottles during transport.
- Protect them for sunlight and intense heat during transport to the lab.

BLOCK-08

BLOCK-08	
CFRC Code	**Task/Skill**
CFRC3-023	**Oncological History Taking** **Take history** from patients with suspected or confirmed malignancy, including presenting complaints, duration, and associated symptoms (e.g., weight loss, fatigue, bleeding).
CFRC3-024	**Self Examination of Breast** **Perform and demonstrate** personal self examination of Breast as primary screening and prevention.
CFRC3-026	**Breast examination** **Perform** a systematic breast examination by inspecting for asymmetry, skin dimpling, nipple retraction, discharge, ulceration, or peau d'orange.
CFRC3-027	**Examination of lump** **Inspect and palpate** a lump, and describe its characteristics based on parameters: site, size, shape, surface, margin, consistency, tenderness, mobility, temperature, transillumination, fluctuation, pulsatility, and regional lymphadenopathy.
CFRC3-028	**Lymph node palpation** **Palpate and describe** lymph nodes; cervical, axillary, epitrochlear, and inguinal for site, size, shape, consistency, tenderness, mobility, and matting.
CFRC3-029	**Biopsy procedure** **Observe** the steps of biopsy procedure for cancer diagnosis. **Identify** indications and precautions.
CFRC3-030	**Chemotherapy and Palliative Care** **Identify** common chemotherapy-related adverse effects and initial management. **Observe and assist** in palliative and comfort care, including pain relief, nutritional support, and psychological care for terminal patients.
CFRC3-031	**Breaking bad news** **Observe** a clinician delivering bad news to a patient diagnosed with malignancy, noting communication techniques and emotional handling. **Practice** the communication skill of breaking bad news to a patient diagnosed with malignancy.

CFRC3-032	**Effective counselling techniques** **Demonstrate** empathy and effective communication when counseling oncology patients and their families.
CFRC3-033	**Examination of hip joint** **Perform** hip joint examination, including Trendelenburg test.
CFRC3-034	**Examination of knee joint** **Examine** knee joint using ligament stability tests, meniscal tests, patellar tap, and bulge sign.
CFRC3-035	**Examination of foot** **Examine** ankle and foot using Thompson test for Achilles tendon rupture.
CFRC3-036	**Examination of hand** **Inspect** patients' hands to identify and describe common deformities such as swan neck, boutonnière, and claw hand.
CFRC3-037	**Lumbar spine examination** **Demonstrate** lumbar spine examination, including straight leg raise (SLR) and femoral stretch tests. **Inspect and palpate** for spinal deformities such as kyphosis, scoliosis, and lordosis
CFRC3-038	**Application/removal of plaster slab** **Apply and remove** a plaster slab or back slab under supervision.
CFRC3-039	**Splint application** **Demonstrate** proper technique for splint application and limb immobilization.
CFRC3-040	**Steroid injection administration** **Observe and assist** in joint aspiration or local steroid injection under aseptic conditions.
CFRC3-041	**X-ray interpretation of bones and joints** **Interpret** X-rays of long bones, joints, and spine to identify common fractures or dislocations.
CFRC3-042	**Personal Protective Equipment (PPE)** **Demonstrate** donning and doffing personal protective equipment (PPE) while managing infectious disease patients.
CFRC3-043	**Sputum Collection for TB Culture and Sensitivity**

	Observe and narrate the procedure for collection, labeling, transport, and storage of sputum specimens for tuberculosis culture and sensitivity, highlighting aseptic technique and biosafety measures. *(see annexure 2)*
CFRC3-044	**Interpretation of vital signs** **Measure and interpret** vital signs (temperature, pulse, respiratory rate) in patients with acute febrile illness.
CFRC3-045	**Post-Exposure Prophylaxis** **Observe** post-exposure management steps for needle-stick injuries or other occupational exposures.
CFRC3-046	**Protocol for Pus specimen collection** Collection, Transport and Storage of Pus Specimen for Culture & Sensitivity

Note: Before signing the logbook entry, the DME/HOD will ensure that the skill/task has been achieved by the student.

Annexure II

Collection, Transport and Storage of Sputum Specimen for TB Culture & Sensitivity

Learning Outcomes

The students will be able to:

1. Describe why the accurate sputum collection, transport, and storage are essential for reliable TB culture and drug sensitivity testing (DST).
2. Describe how to prepare and instruct patients for proper sputum (not saliva) collection.
3. Describe the characteristics of an ideal sputum specimen (volume, appearance, timing).
4. Describe the time limits and temperature conditions for transporting sputum specimens to the laboratory.
5. Understand and describe the triple packaging system used for specimen safety and infection control during transport.
6. Specify the optimal storage temperature and maximum duration for sputum before processing
7. Recognize biosafety measures (e.g., PPE, sealed containers) during sputum handling.
8. Understand the importance of correct labeling and documentation to accompany the sample to the lab.
9. Explain how proper specimen management supports early and accurate diagnosis, especially in detecting MDR-TB/XDR-TB

Collection of Sputum Specimen:

Give the patient a clean (need not be sterile), dry, wide-necked, leak-proof container, and request him or her to cough deeply to produce a sputum specimen. The best time for collection of sputum specimen is early morning.

Instructions for the Patient:

Use a wide-mouthed, sterile, leak-proof plastic container with a tight-fitting screw cap.
Volume: At least 3–5 mL of sputum (not saliva)

1. Instruct the Patient to his/her their mouth with water (not any mouthwash) to reduce contamination.
2. Take a deep breath
3. Cough deeply from the chest (not saliva)
4. Expectorate sputum into the container
5. Avoid saliva or nasal discharge
6. Tighten the cap of the container to avoid contamination and spillage
7. For accurate and reliable detection of *Mycobacterium Tuberculosis*, three consecutive specimens on three consecutive days should be collected.

Transport of sputum Specimen to Microbiology laboratory:

1. Transport the specimen to the Microbiology laboratory within 1-2 hours
2. If delay is expected, the specimen can be stored at **2–8°C** for **up to 48–72 hours**
3. Do not Freeze the specimen
4. The sputum specimen for TB culture should be transported in triple packaging system
   - Sealed Sputum container with sputum specimen
   - Specimen should be sealed in Biohazard Zipper bag
   - The biohazard zipper bag should be placed in a Biohazard transport box
   - The specimen should be properly labelled with patient name, unique ID, date and time of collection

ANNEXURE III

(Collection, Transport and Storage of Pus Specimen for Culture & Sensitivity)

Learning Outcomes

The students will be able to:

1. Understand the importance of proper Pus collection techniques in an aseptic manner to avoid contamination
2. Describe the steps involved in collecting PUS, including patient preparation, site preparation and sample handling.
3. Select the appropriate tubes/containers for Pus collection and transport media and understand the importance of viability of organisms in the specimen
4. Understand the importance of proper labelling and documentation to ensure patient safety and sample tracking
5. Understand the importance of timely transport of specimen to the Microbiology laboratory to ensure timely analysis.
6. Understand how factors like sample handling, storage and transportation can affect test results

Collection and Transport of Pus Specimen

Pus specimen should be collected by a medical officer or an experienced nurse. Pus from an abscess is best collected at the time, the abscess is incised and drained, or after it has ruptured naturally. When collecting pus from abscesses, wounds, or other sites, special care should be taken to avoid contaminating the specimen with commensal organisms from the skin. As far as possible, a specimen from a wound should be collected before an antiseptic dressing is applied.

1. Using a sterile technique, aspirate or collect from a drainage tube up to 5 ml of pus. Transfer to a leak-proof sterile container.
2. When pus is not being discharged, use a sterile cotton-wool swab to collect a sample from the infected site. Immerse the swab in a container of Amies transport medium.

Label the specimen and as soon as possible deliver it with a completed request form to the laboratory. **Do not transport the Pus swab without transport medium**

3. When mycetoma is suspected, obtain a specimen from a draining sinus tract using a sterile hypodermic needle to lift up the crusty surface over the sinus opening. This method of specimen collection has the advantage that the pus obtained is usually free
   from secondary organisms and the draining granules can usually be seen clearly and removed for microscopical examination. Transfer the pus to a sterile container.
4. When tuberculosis is suspected: Aspirate a sample of the pus and transfer it to a sterile container. The container should be packed into a biohazard bag to prevent its transmission to others.
5. When the tissue is deeply ulcerated and necrotic (full of dead cells) aspirate a sample of infected material from the side wall of the ulcer using a sterile needle and syringe. Transfer to a sterile container.
6. Fluid from pustules, buboes, and blisters: Aspirate a specimen using a sterile needle and syringe. Transfer to a sterile container.
7. Serous fluid from skin ulcers, papillomas, or papules, that may contain treponemes collect a drop of the exudate directly on a clean cover glass and invert it on a clean slide. Immediately deliver the specimen to the laboratory for examination by dark-field microscopy.

Transport of Pus Specimen to Microbiology Laboratory

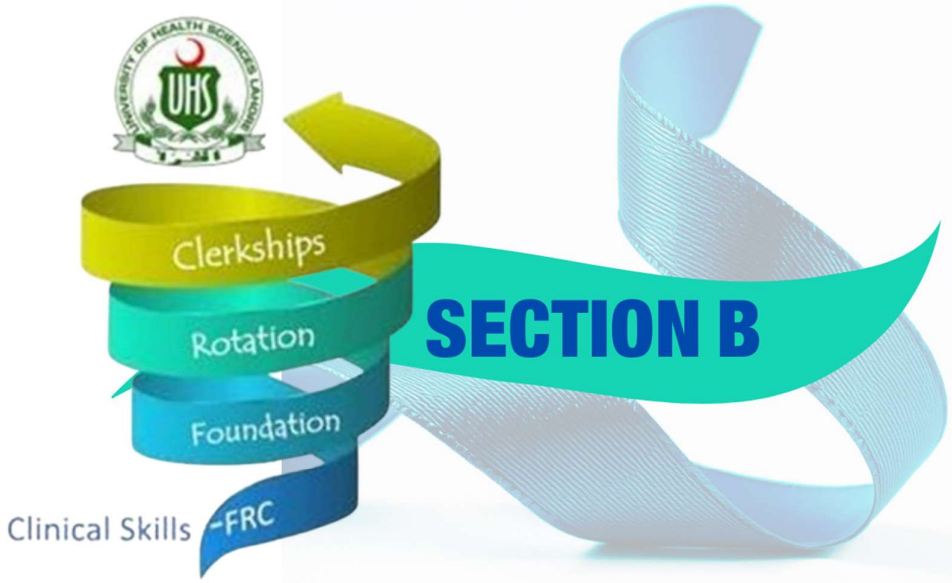
1. Collect the specimen using a sterile cotton wool swab. Insert it in a container of Amies transport medium
2. When the material is aspirated fluid from a pustule, transfer the fluid to a sterile, leak-proof container.
3. Send the specimens with a completed request form to reach the microbiology laboratory within 6 hours (Amies transport Medium). The Aspirated Pus should be transported to the Microbiology laboratory within 1 hour of collection.

BLOCK-09

BLOCK-09	
CFRC Code	**Task/Skill**
CFRC3-047	**History taking- chest pain** **Take history** of a patient with chest pain and suggest differential diagnoses with emphasis on ischemic heart disease, pulmonary, and gastrointestinal causes.
CFRC3-048	**History taking- palpitations** **Take history** of a patient with palpitations and suggest differential diagnoses with emphasis on hypertension, heart failure, and ischemic heart disease.
CFRC3-049	**History taking- dyspnea** **Take history** of a patient with dyspnea and correlate with cardiac and respiratory causes.
CFRC3-050	**Inspection of precordium** **Inspect** the precordium for visible pulsations, scars, or deformities.
CFRC3-051	**Measurement of JVP** **Measure** jugular venous pressure (JVP) accurately and **interpret** findings.
CFRC3-052	**Apex beat palpation** **Palpate** the apex beat for location, character, and displacement.
CFRC3-053	**Palpation of peripheral pulses** **Palpate** peripheral pulses (radial, carotid, femoral, dorsalis pedis) and **assess** rate, rhythm, and volume.
CFRC3-054	**Auscultation of precordium** **Auscultate** the precordium to identify normal heart sounds, added sounds, and murmurs.
CFRC3-055	**ECG conduction** **Perform and interpret** electrocardiography (ECG) independently according to standard protocol.
CFRC3-056	**ECG interpretation** **Identify** ST-segment and T-wave abnormalities on an ECG and **correlate** them with ischemia, myocardial infarction, and electrolyte disturbances.
CFRC3-057	**Blood pressure measurement and interpretation**

	Measure blood pressure accurately using a sphygmomanometer and **interpret** normal and abnormal readings.
CFRC3-058	**Signs of heart failure** **Identify and report** signs of heart failure such as pedal edema, raised JVP, hepatomegaly, and basal crepitation.
CFRC3-059	**History taking-cough, sputum, dyspnea, wheeze** **Perform** focused history taking for cough, sputum production, dyspnea, and wheezing, and **suggest** differential diagnoses focusing on asthma, COPD, tuberculosis, and pneumonia.
CFRC3-060	**Chest inspection** **Inspect** the chest for shape, symmetry, deformities, and movement.
CFRC3-061	**Chest palpation** **Palpate** the chest wall to assess expansion, tracheal position, and tactile fremitus.
CFRC3-062	**Chest percussion** **Percuss** the chest to assess resonance and dullness and identify areas of consolidation or effusion.
CFRC3-063	**Chest auscultation** **Auscultate** the lungs to identify normal breath sounds, added sounds (crackles, wheeze), and differentiate obstructive and restrictive patterns.
CFRC3-064	**Respiratory rate interpretation** **Measure** respiratory rate and interpret abnormal findings in the context of respiratory distress.
CFRC3-065	**Peak expiratory flow rate measurement and interpretation** **Measure** peak expiratory flow rate (PEFR) using a peak flow meter and **interpret** results.
CFRC3-066	**Inhaler and Spacer Use** **Demonstrate** proper use of an inhaler or spacer device and counsel the patient on correct technique.
CFRC3-067	**Respiratory failure signs** **Identify and report** signs of respiratory failure and the need for urgent referral.

Note: Before signing the logbook entry, the DME/HOD will ensure that the skill/task has been achieved by the student.



SECTION B

Case-Based Discussion (CBD) Form for Third-Year MBBS

Section	Field	Options/Notes
Trainee Information	Name	
	Student ID	
	Assessment Date	
	Location of CBD	
Assessor Information	Name	
	Designation	
	Department	
Case Details	Clinical Setting	☐ Inpatient ☐ Outpatient ☐ Emergency ☐ Elective
	Complexity of Case	☐ Basic (third-year level) ☐ Moderate ☐ Complex
	Focus of Encounter	☐ History ☐ Physical Examination ☐ Diagnosis ☐ Initial Management ☐ Patient Education ☐ Documentation
	Summary of Case	
Assessment Areas	Medical Record Keeping	☐ Outstanding ☐ Satisfactory ☐ Needs Improvement
	Clinical Assessment	☐ Outstanding ☐ Satisfactory ☐ Needs Improvement
	Diagnostic Skills	☐ Outstanding ☐ Satisfactory ☐ Needs Improvement
	Initial Management Plan	☐ Outstanding ☐ Satisfactory ☐ Needs Improvement
	Communication Skills	☐ Outstanding ☐ Satisfactory ☐ Needs Improvement
	Professionalism	☐ Outstanding ☐ Satisfactory ☐ Needs Improvement
Feedback	Strengths	
	Areas for Development	
	Recommended Actions	
Trainee Reflection	Learning from the Experience	

	Strengths
	Improvement Points
Signatures	Trainee's Signature
	Assessor's Signature

i. At least 1/3rd of entries per block (DME to decide the codes of entries to be entered for each student)
ii. One OSCE/CBD/Mini-CEX for every student as **EOR Assessment** for every block

PRESCRIPTION INFERENCE CARD

Learning Outcome:

This structured "**Prescription Inference Card"** will guide students to make a foundation in clinical pharmacology, building their understanding of drug's theatrical and clinical application.

Instructions/Protocols

The students will gather three real time prescriptions during each module in third & fourth year in morning /evening time.

It will be then discussed in coming pharmacology lecture/practical/tutorial time

At the end of each module the cards will be submitted for assessment, grading and awarding marks by Pharmacology department for formative & summative assessment.

Prescription Collection:

Ensure to collect three prescriptions from different patients in each module

Documentation:

Keep a record of all activities for personal learning and to share with mentors or faculty as required for assessment and marks

PRESCRIPTION INFERENCE CARD

Student's Name: _____

MBBS Year: _____**Roll no:** _____ **UHS Registration no:** _____

Block: _____**Module:** _____

Provisional Diagnosis: _____

Date			
Drug & Group			
Brand Name			
Generic Name			
Purpose of drug (Symptomatic/Specific)			
Dosage & Form			
Route of Administration			
Monitoring Parameters			
ADVERSE EFFECTS			
Observations / Text Book			
DRUG INTERACTIONS			
Observations / Text Book			
CONTRAINDICATIONS			
Observations / Text Book			
PRECAUTIONS			
Specifically Advised			
Comments / Instructions			
HOD Pharmacology Sign & Stamp			

05

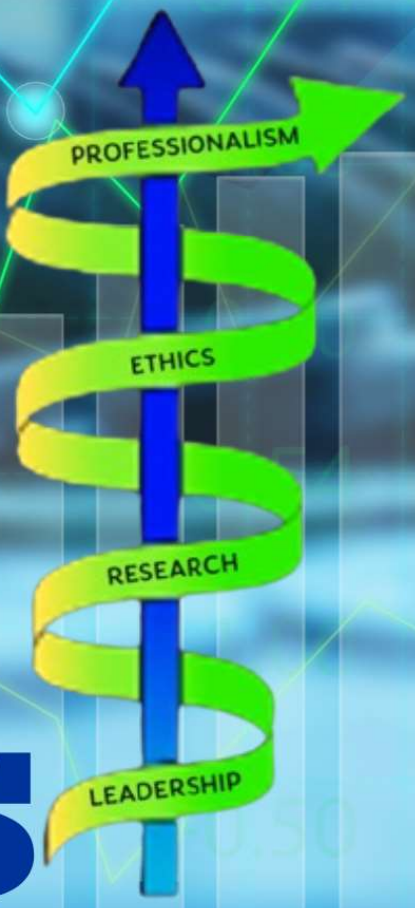
Section

YEAR-3

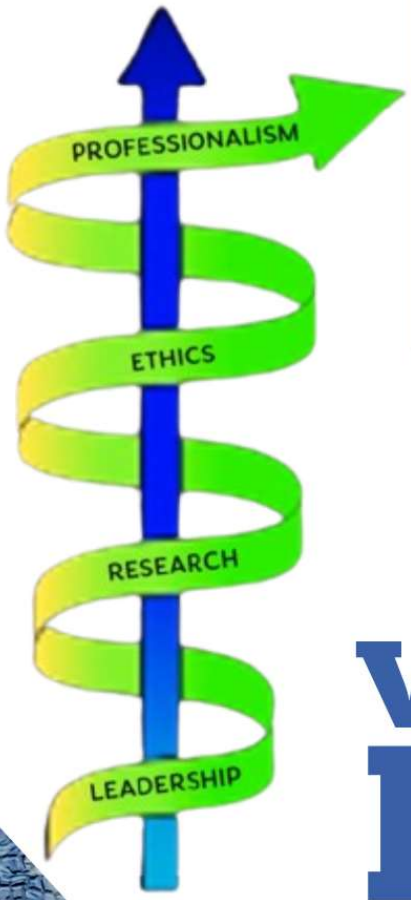
University of Health Sciences Lahore

Modular Integrated Curriculum 2K23

MBBS Year-03



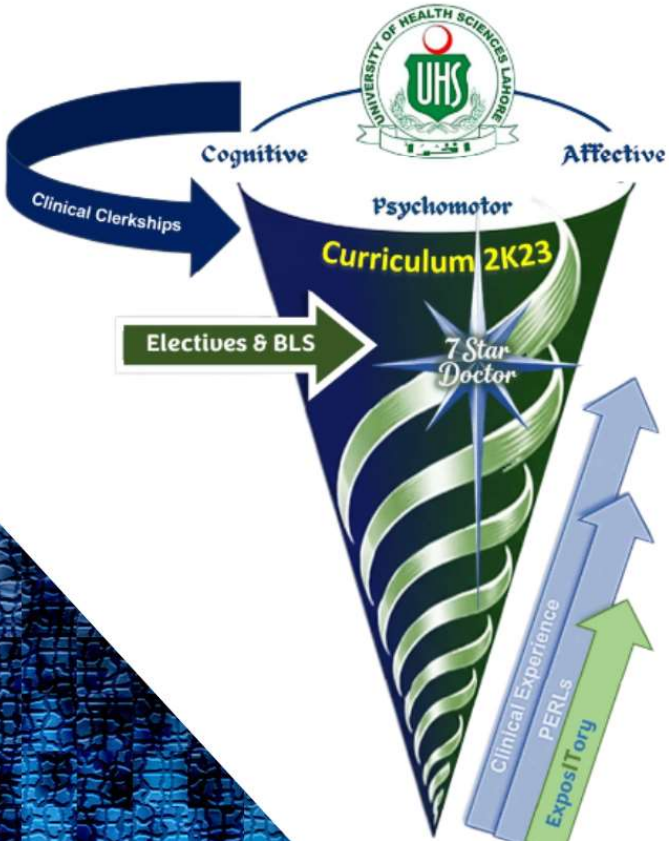
PERLs



Modular Integrated Curriculum 2K23

MBBS Year-3

Volume-3
PERLs-3



IMPLEMENTATION PLAN
This section includes the implementation strategy for the PERL Module. It is advised that the DME and facilitators from respective colleges involved in implementing PERLS should read this section carefully before initiating related instructional activities in respective colleges.
PORTFOLIO TEMPLATE
A portfolio template is hereby given with proposed activities for the colleges to use /modify as per their resources. Please note that Portfolio can be hard-bound or e-portfolio depending on the individual college's decision.

INTRODUCTION
PROFESSIONALISM
ETHICS
RESEARCH
LEADERSHIP

MODULE RATIONALE

The UHS PERL module is designed to equip medical students with essential competencies in Professionalism, Ethics, Research, and Leadership, aligning with the PMDC 7-Star Doctor (Professional, Ethical, Scholar, Leader, Communicator, Health Advocate, and Collaborator) framework. This framework emphasizes the multifaceted role of a physician, highlighting the need for a holistic approach to medical education. In an era where healthcare systems are constantly evolving, integrating these core areas is vital for developing well-rounded, responsible, and effective healthcare professionals.

1. **Importance of Professionalism:**
   Professionalism is the cornerstone of medical practice, influencing patient trust and the overall quality of care. This module emphasizes the significance of professional behavior, including accountability, integrity, and respect for diversity, ensuring that students cultivate a strong ethical foundation as they progress through their medical education.
2. **Ethical Decision-Making:**
   As future healthcare providers, students will face complex ethical dilemmas that require sound judgment and moral reasoning. This module focuses on key ethical principles, such as patient autonomy, equity, and justice in resource allocation, particularly in challenging areas like neoplasia and inflammation. Understanding these principles prepares students to advocate for their patients while navigating the intricate landscape of modern healthcare.
3. **Research Competence:**
   Research plays a critical role in advancing medical knowledge and improving patient outcomes. By emphasizing evidence-based practice, this module encourages students to engage with scientific literature, develop robust literature search strategies, conduct research projects and apply research findings to clinical decision-making. This skill set is essential for fostering a culture of inquiry and continuous improvement within the healthcare profession.
4. **Leadership Development:**
   Leadership is an integral part of effective healthcare delivery. This module prepares students to take on leadership roles, emphasizing teamwork, conflict resolution, and effective communication. By fostering leadership skills, we aim to empower students to

influence positive changes in their future workplaces and advocate for patient-centered care.

In summary, the UHS PERL module is designed to create a comprehensive learning experience that prepares medical students for the challenges and responsibilities they will face in their careers. By integrating Professionalism, Ethics, Research, and Leadership, we aim to cultivate competent, compassionate, and ethical healthcare professionals who are equipped to make informed decisions and lead with integrity in an ever-changing medical landscape.

MODULE LEARNING OUTCOMES

- Exhibit accountability, integrity, and respect for diversity in all aspects of medical practice, embodying the principles of professionalism in clinical and academic settings.
- Analyze and apply ethical principles related to patient care, including autonomy, beneficence, non-maleficence, and justice, particularly in challenging situations such as end-of-life decisions and resource allocation.
- Develop and implement effective literature search strategies, critically evaluate scientific literature, and synthesize findings to inform clinical decision-making and practice.
- Participate in a comprehensive research project, from formulating a research question to data collection and analysis, culminating in the production of a publishable manuscript that meets academic and ethical standards.
- Demonstrate leadership skills through effective communication, conflict resolution, and teamwork, fostering a collaborative environment that enhances patient care and academic performance.
- Recognize and address the social determinants of health, advocating for equity in healthcare access and outcomes for diverse patient populations.
- Engage in self-assessment and reflective practices to identify strengths and areas for improvement, creating actionable plans for personal and professional growth throughout their medical education.
- Utilize effective verbal and non-verbal communication skills to engage with patients, families, and colleagues, ensuring clear and compassionate exchanges that enhance understanding and trust.

SUBJECTS INTEGRATED IN THE MODULE

1. Professionalism
2. Ethics
3. Research
4. Leadership

LEARNING RESOURCES

1. **Professionalism**:

- Azam, M. (2021). Mind maps for medicine. Scion Publishing. https://scionpublishing.com/product/mind-maps-for-medicine/
- Bin Abdulrahman, K. A., Khalaf, A. M., Bin Abbas, F. B., & Alanazi, O. T. (2021). Study habits of highly effective medical students. *Advances in Medical Education and Practice, 12*, 627–633. https://doi.org/10.2147/AMEP.S309535
- Bandaranayake, R. C. (2013). Study skills. In K. Walsh (Ed.), *Oxford textbook of medical education* (pp. 244–254). Oxford University Press. https://doi.org/10.1093/med/9780199652679.003.0021
- American Board of Internal Medicine Foundation, American College of Physicians Foundation, & European Federation of Internal Medicine. (2005). Medical professionalism in the new millennium: A physician charter. Retrieved from https://www.abimfoundation.org/what-we-do/physician-charter:contentReference[oaicite:0]{index=0}
- Barnhoorn, P. C., Houtlosser, M., Ottenhoff-de Jonge, M. W., Essers, G. T. J. M., Numans, M. E., & Kramer, A. W. M. (2019). A practical framework for remediating unprofessional behavior and for developing professionalism competencies and a professional identity. *Medical Teacher, 41*(3), 303–308. https://doi.org/10.1080/0142159X.2018.1464133:contentReference[oaicite:1]{index=1}
- Guraya, S. S., Guraya, S. Y., Harkin, D. W., Ryan, Á., Mat Nor, M. Z. B., & Yusoff, M. S. B. (2021). Medical Education e-Professionalism (MEeP) framework; From conception to development. *Medical Education Online, 26*(1), 1983926. https://doi.org/10.1080/10872981.2021.1983926:contentReference[oaicite:2]{index=2}
- Kirk, L. M. (2007). Professionalism in medicine: Definitions and considerations for teaching. *Baylor University Medical Center Proceedings, 20*(1), 13–16. https://doi.org/10.1080/08998280.2007.11928225:contentReference[oaicite:3]{index=3}
- Al-Eraky, M. M. (2015). Faculty development for medical professionalism in an Arabian context. [Doctoral Thesis, Maastricht University]. Maastricht University. https://doi.org/10.26481/dis.20150521ma:contentReference[oaicite:0]{index=0}
- Online Journals and Reading Materials through HEC Digital Library Facility

2. **Ethics**:

- World Health Organization. (2015). Global health ethics: Key issues. World Health Organization. https://apps.who.int/iris/handle/10665/164576
- World Health Organization. (2011). Standards and operational guidance for ethics review of health-related research with human participants. World Health Organization. https://www.who.int/publications/i/item/9789241502948

- World Health Organization. (2023). WHO Code of Ethics. World Health Organization.
- Harvey, J. C. (n.d.). Clinical ethics: The art of medicine. In Military Medical Ethics, Volume 1, Chapter 3.
- National Bioethics Committee. (2017). Guidelines and teachers handbook for introducing bioethics to medical and dental students. Healthcare Ethics Committee (HCEC).
- Varkey, B. (2021). Principles of clinical ethics and their application to practice. Medical Principles and Practice, 30(1), 17-28. https://doi.org/10.1159/000509119
- Pakistan Medical and Dental Council. (2018). Professional ethics and code of conduct.
- Online Journals and Reading Materials through HEC Digital Library Facility

3. **Research**

- Medical Statistics. 2nd Ed. by R. Turkwood.
- Biddle, K., Blundell, A., & Sofat, N. (2023). Understanding clinical research: An introduction. Scion Publishing. https://scionpublishing.com/product/understanding-clinical-research/
- Harris, M., & Taylor, G. (2020). Medical Statistics Made Easy (4th ed.). Scion Publishing. https://scionpublishing.com/product/medical-statistics-made-easy-fourth-edition/
- Allen, A. K. (2012). Research skills for medical students. SAGE Publications, Inc. https://doi.org/10.4135/9781526436016
- Online Journals and Reading Materials through HEC Digital Library Facility

4. **Leadership**

- Wamboldt, R., & Loughran, N. (2017). Communication skills for OSCEs. Scion Publishing. https://scionpublishing.com/product/communication-skills-for-osces/
- Edmonstone, J. (2018). Leadership development in health care in low and middle-income countries: Is there another way? *International Journal of Health Planning and Management, 33*(4), e1193–e1199. https://doi.org/10.1002/hpm.2606:contentReference[oaicite:0]{index=0}
- National Center for Healthcare Leadership. (2018). Health Leadership Competency Model 3.0. Chicago, IL: National Center for Healthcare Leadership. https://nchl.org:contentReference[oaicite:0]{index=0}
- Chen T. Y. (2018). Medical leadership: An important and required competency for medical students. *Ci ji yi xue za zhi = Tzu-chi medical journal*, *30*(2), 66–70. https://doi.org/10.4103/tcmj.tcmj_26_18

Note:

*****Research (R)*** *in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*

FACILITATOR'S
GUIDE
PROFESSIONALISM
ETHICS
RESEARCH
LEADERSHIP

INTRODUCTION

The UHS PERL Module is designed to equip medical students with essential competencies in Professionalism, Ethics, Research, and Leadership. This guide provides facilitators with an overview of the module, instructional strategies, and resources to effectively engage students in their learning journey.

MODULE OVERVIEW

- **Professionalism**: Focus on developing professional behavior and attitudes.
- **Ethics**: Emphasis on understanding and applying ethical principles in healthcare.
- **Research**: Development of research skills and critical appraisal abilities.
- **Leadership**: Enhancement of leadership qualities and communication skills.

MODULE STRUCTURE

1. **Professionalism**
    - **a.** Focus: Development of professional behavior and attitudes essential for medical practice.
    - **b.** Key Topics:
        - **i.** Professional identity formation
        - **ii.** Accountability and integrity
        - **iii.** Respect for diversity
2. **Ethics**
    - **a.** Focus: Understanding and applying ethical principles in healthcare.
    - **b.** Key Topics:
        - **i.** Virtue ethics and moral character
        - **ii.** Informed consent and patient autonomy
        - **iii.** Bioethics and clinical ethics
3. **Research**
    - a. Focus: Developing research skills and critical appraisal abilities.
    - b. Key Topics:
        - i. Basics of academic writing
        - ii. Literature searches and reviews
        - iii. Evidence-based medicine and research methodologies
4. **Leadership**
    - a. Focus: Enhancing leadership qualities and communication skills.

b. Key Topics:
   i. Team dynamics and conflict resolution
   ii. Patient counseling and informed consent
   iii. Work-life balance and management skills

MODULE IDEOLOGY

The UHS PERLs module is designed to provide a comprehensive and integrated approach to developing essential competencies in Professionalism, Ethics, Research, and Leadership for medical students throughout their undergraduate training.

Professionalism Module

The Professionalism module begins with the foundational attributes of a professional student or doctor, focusing on intrapersonal skills in the first year. As students progress to the second and third years, the emphasis shifts toward interpersonal skills relevant to various domains, culminating in the formation of a Professional Identity in the fourth year. This progression ensures that students develop not only self-awareness but also the ability to interact effectively and ethically with patients and colleagues.

Ethics Module

The Ethics module initiates discussions on virtue ethics, emphasizing the virtues and moral character expected of medical students and professionals. In the second year, students delve into bioethics, followed by clinical ethics and research ethics in the third and fourth years. This structure helps students navigate the complexities of ethical dilemmas in medical practice, ensuring they are prepared to make informed, compassionate decisions that respect patient autonomy and promote justice.

Research Module

The Research module begins with the basics of academic writing, introducing students to the structure of a manuscript and critical appraisal through Journal Club Meetings and presentations in the first year. In the second year, the focus shifts to literature searches, summarization, and reviews, incorporating the use of artificial intelligence to enhance research capabilities. The third year introduces evidence-based medicine as a treatment guide in disease management, followed by research design, methodology, clinical audits, and patient safety, culminating in the development of a draft ethical approval proposal. This systematic approach equips students with

the skills to conduct meaningful research and contribute to the advancement of medical knowledge.

Leadership Module

The Leadership module starts with personal qualities and communication skills in the first year, emphasizing the importance of effective interaction in healthcare settings. In the second year, the focus expands to teamwork dynamics, patient counseling, informed consent, conflict resolution, and work-life balance. The third year emphasizes management skills, including project management (aligned with research projects), entrepreneurship, and the use of innovation, such as AI in research and team leadership in healthcare setups. Finally, the fourth-year centers on professional identity, self-evaluation, digital transformation in healthcare, public health initiatives, health reforms, and advocacy. Throughout this module, mentoring sessions are integrated to provide role modeling and support, reinforcing the development of a strong professional identity among undergraduate MBBS students.

MODULE DEVELOPMENT AND VALIDATION

The UHS PERL module was developed through a scientific approach, involving the systematic identification of content via extensive literature searches, national and international guidelines, and recommendations from content contributors. This initial framework was presented to a panel of 10 invited experts in a modified e-Delphi round for validation.

During this process, the experts evaluated the module's content and provided constructive feedback, identifying areas for improvement. In the second round, a consensus was reached regarding the relevance of the module content, as well as its depth and scope tailored to the appropriate MBBS year.

Following the module development and validation, two independent reviewers were engaged to assess the sequencing and flow of the topics. Their review focused on ensuring logical coherence and identifying any additional revisions necessary to enhance the module's clarity and effectiveness. Further, the review was requested from an early career doctor who had recently graduated from an affiliated medical college in order to involve their suggestions for improvement. This rigorous development and validation process ensures that the UHS PERL module meets the highest educational standards and effectively prepares medical students for their professional journey.

LEARNING OBJECTIVES EXPLAINATION

The learning objectives for the UHS PERL module are crafted to enhance students' comprehension and practical application of core competencies in Professionalism, Ethics, Research, and Leadership. Each objective consists of an **Initial Learning Objective** and an **Actionable Learning Objective**, guiding both instructional methods and portfolio assignments.

Example: Work-Life Balance (Leadership)

Learning Objective:

- **Understand the importance of maintaining a healthy work-life balance**, focusing on strategies for managing personal well-being while fulfilling professional commitments to ensure optimal mental and physical health.

Actionable Learning Objective:

- "Students will **create a personal plan** that outlines strategies for achieving work-life balance, including time management, self-care practices, and setting boundaries between personal and professional life."

Instructional Strategies:

- Use **interactive discussions** to explore the concept of work-life balance.
- Facilitate **workshops** where students can share experiences and strategies.
- Implement **guided planning sessions** where students can outline their personal plans with facilitator support.
- Encourage **peer feedback sessions** for students to share and refine their plans collaboratively.

Proposed Portfolio Entry:

- "Submit a reflection on your work-life balance plan. Include specific strategies you intend to implement to manage stress and maintain your well-being while meeting your academic and professional responsibilities."

Portfolio Guidance:

- Ensure students understand the importance of documenting their plans and reflections as a means to monitor their progress and make adjustments as needed.
- Provide a rubric that emphasizes clarity, depth of reflection, and practical application in their submissions.

DIVERSE INSTRUCTIONAL STRATEGIES TO FOSTER STUDENT-CENTERED LEARNING

To enhance student engagement and promote a deeper understanding of the material, the following instructional strategies can (not limited to) be employed:

1. **Active Learning**: Incorporate activities that require students to actively participate, such as problem-solving exercises, team-based in learning, group discussions, and hands-on simulations.
2. **Collaborative Learning**: Utilize small group work to encourage peer interaction and knowledge sharing, fostering a sense of community and collaborative problem-solving.
3. **Flipped Classroom**: Assign readings or videos for students to review before class, allowing class time to focus on discussions and practical applications of the material.
4. **Case-Based Learning**: Present real-world scenarios for students to analyze, encouraging critical thinking and the application of theoretical knowledge to practical situations.
5. **Technology Integration**: Leverage digital tools and online platforms to facilitate interactive learning experiences, such as virtual simulations, discussion forums, and collaborative projects.
6. **Mentoring and Peer Support**: Encourage mentorship opportunities where students can receive guidance from peers or professionals, fostering a supportive learning environment.

PORTFOLIO ENTRY WITH PEEL CONCEPT

As part of the UHS PERL module, students will maintain a portfolio that incorporates the PEEL (Point, Evidence, Explanation, Link) concept for reflective entries:

1. **Point**: State the main idea or argument you want to discuss in your reflection or analysis.
2. **Evidence**: Provide supporting evidence or examples from your experiences, coursework, or relevant literature.
3. **Explanation**: Explain how the evidence supports your point, including its significance and implications for your learning.
4. **Link**: Connect your point to broader themes in the module or your overall personal and professional development.

Portfolio Guidance:

- Portfolio can be in hard bound or e-portfolio. A template for portfolio entry has been attached.
- Encourage students to use the PEEL framework to structure their reflections clearly and coherently. This will aid in their understanding of the material and enhance their ability to articulate their thoughts and learning experiences effectively.

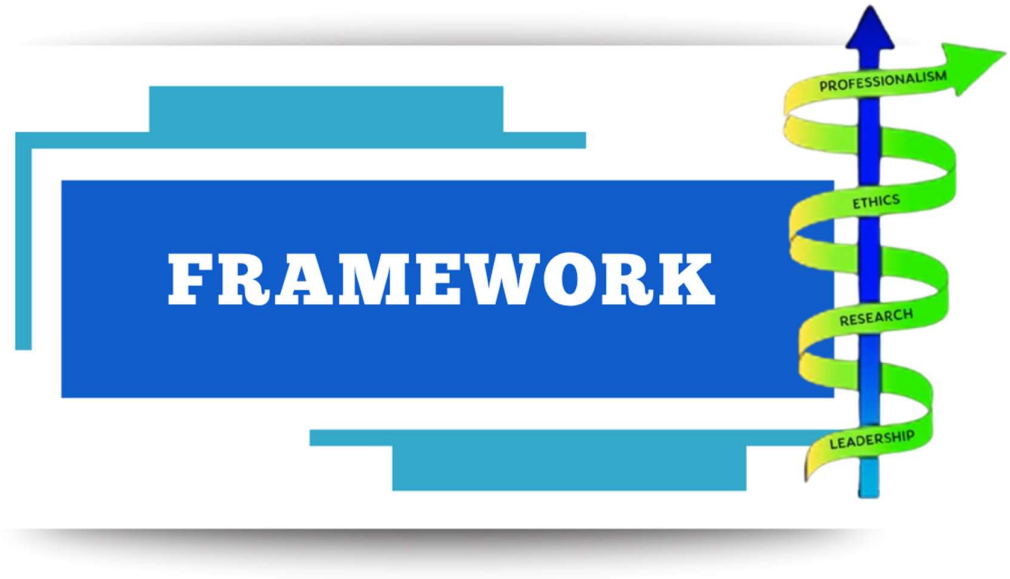
ROLE IN EVALUATION OF THE PERL MODULE

As a facilitator, your role in the evaluation of the UHS PERL module is crucial for ensuring its effectiveness and relevance. Key responsibilities include:

1. Monitoring Student Progress: Regularly assess student engagement and understanding through formative assessments, feedback, and participation in discussions and activities.
2. Collecting Feedback: Gather feedback from students regarding their learning experiences, instructional strategies, and the relevance of module content. This information is vital for continuous improvement.
3. Evaluating Learning Outcomes: Review the alignment of students' performances with the stated learning outcomes. Analyze assessment results to identify trends and areas needing improvement.
4. Reflecting on Teaching Practices: Engage in self-reflection and peer evaluation to assess your own teaching methods. Consider what strategies worked well and where adjustments may be needed to enhance student learning.
5. Implementing Changes: Based on evaluation findings, propose and implement changes to instructional methods, content delivery, or assessment strategies to better meet the needs of future cohorts.

CONCLUSION

As a facilitator of the UHS PERL module, your role is crucial in guiding students through the complexities of Professionalism, Ethics, Research, and Leadership. By utilizing diverse instructional strategies and fostering an engaging learning environment, you will help students develop the competencies necessary for their future roles as healthcare professionals.


FRAMEWORK
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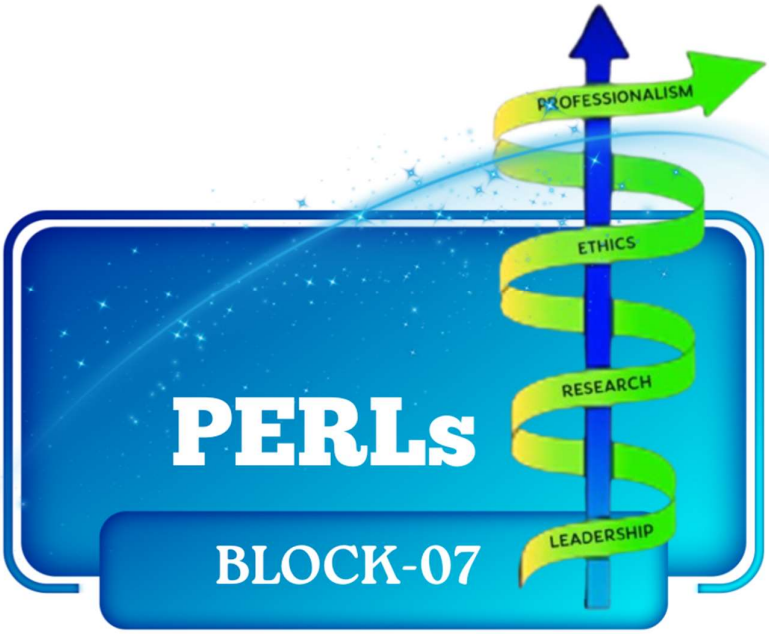

PROFESSIONALISM
ETHICS
RESEARCH
LEADERSHIP
PERLs
BLOCK-07

FOUNDATION-II & EBM				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 7.5**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-001	**Professionalism**	Professional Responsibility in Clinical Rotations	• Understand the basic professional behaviours expected in clinical rotations, such as punctuality, appropriate communication, and respectful interactions with patients and staff. • Observe a clinical setting and identify key professional behaviours demonstrated by healthcare staff, such as maintaining punctuality and professional communication	A brief reflection on the key professional behaviours observed during the first clinical rotation session, noting how these behaviours contribute to patient care and professional conduct.
PERLs-3-002	**Research**	Legal and Ethical Frameworks governing medical research	• Discuss the legal and ethical frameworks governing medical research, including protection of human subjects, informed consent, privacy, and compliance with national and international regulations.	
PERLs-3-003	**Research**	Institutional Ethical Review	• Discuss the role of Institutional Review Boards (IRBs) in the research process. • Identify and explain the different components of your institutional ethical review proforma to demonstrate its understanding.	

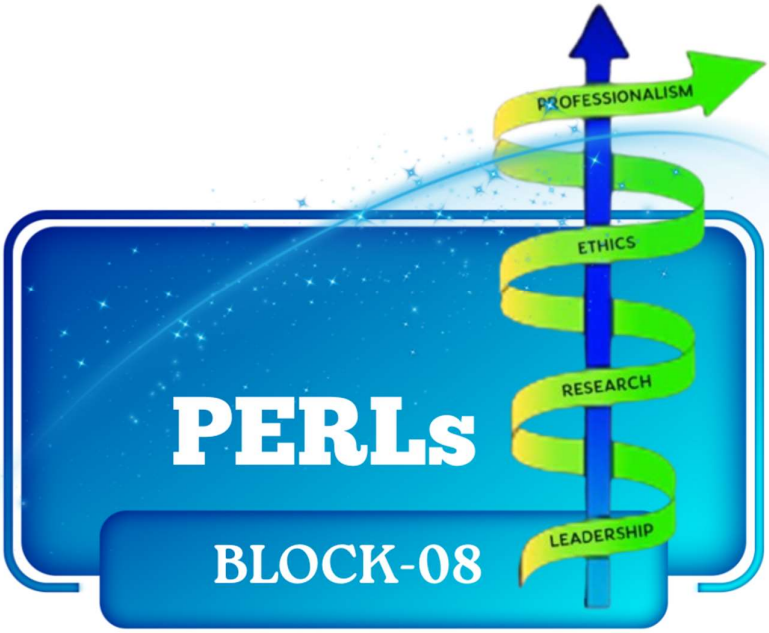
PERLs-3-004	**Ethics**	Reporting medical errors	• Discuss the ethical obligations in reporting medical errors and the role of transparency in maintaining patient trust and improving care quality. • Draft an incident report on a simulated medical error, outlining the ethical considerations and steps taken to address the issue	Submit a written incident report on a simulated or real medical error, including the ethical implications and actions taken.
PERLs-3-005	**Leadership**	Role Modelling/ Mentoring Session V	• 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. Discuss any challenges faced while carrying out any action plan if already created and related solutions to overcome those challenges.	Mentoring Session V Key decisions

GENERAL & CLINICAL PHARMACOLOGY				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 06**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-006	**Professionalism**	Responsible use of social media Platforms	• Discuss the principles of responsible use of social media platforms, including safeguarding patient confidentiality, conducting ethical interactions, and practising careful online sharing. Discuss available social media use guidelines in healthcare.	Develop and submit personal social media guidelines that reflect ethical use in professional and medical contexts
PERLs-3-007	**Ethics**	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 to maintain professional integrity. Analyze a case study where a conflict of interest occurred involving pharmaceutical companies, and propose strategies for ethically managing such situations	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.
PERLs-3-008	**Research**	Gaps in Literature	Discuss the importance of identifying gaps in existing literature for formulating meaningful research problems. Identify at least one significant gap from the literature review of a	

			selected topic that requires further exploration. Formulate a research question or hypothesis to address the identified literature gap. Refine a previously selected research title in light of the identified gap.	
PERLs-3-009	**Leader**	Artificial Intelligence in Research	• 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. • Discuss the ethical implications of using AI in research, including bias, data privacy, transparency, and accountability concerns. • Demonstrate the use of AI tools as supplementary tools in research.	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.

HEMATOPOETIC, IMMUNITY & TRANSPLANT				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 1.5**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-010	**Professionalism**	Maintaining Patient Confidentiality	• Discuss the principles for maintaining patient confidentiality. • Appreciate the importance of maintaining patient confidentiality in clinical practice. • Discus legal and ethical implications of patient confidentiality.	Reflective entry on a clinical case where confidentiality was maintained, detailing the challenges and how they were addressed.
PERLs-3-011	**Research**	Research References	• Identify different reference styles. • Use reference management software to apply Vancouver style of referencing. • Use reference management software to apply APA style of referencing.	

FORENSIC MEDICINE & TOXICOLOGY				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 4.5**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-O12	**Ethics**	Human Rights & Malpractice	• Discuss ethical principles surrounding human rights in healthcare, particularly in malpractice cases, and recognize the professional obligations to uphold patients' rights while preventing and addressing malpractice.	Case analysis of a malpractice incident, discussing the implications of human rights and detailing measures that could have been implemented to avoid the violation of patient rights.
PERLs-3-O13	**Research**	Introduction section of Research	• Write and submit the introduction section of a research proposal with proper referencing for teachers' feedback. • Refine the research title and introduction based on feedback received.	
PERLs-3-O14	**Leadership**	Project Management	• Introduce the basic concepts of project management in healthcare, including planning, organizing, and executing small projects, such as case studies or group assignments. Participate in a class activity, where they will plan and organize tasks, set timelines, and assign roles to ensure the project is completed efficiently.	Write a Class activity report with assigned roles taken by each group member. Critically evaluate the challenges observed with proposed recommendations.


PROFESSIONALISM
ETHICS
RESEARCH
LEADERSHIP
PERLs
BLOCK-08

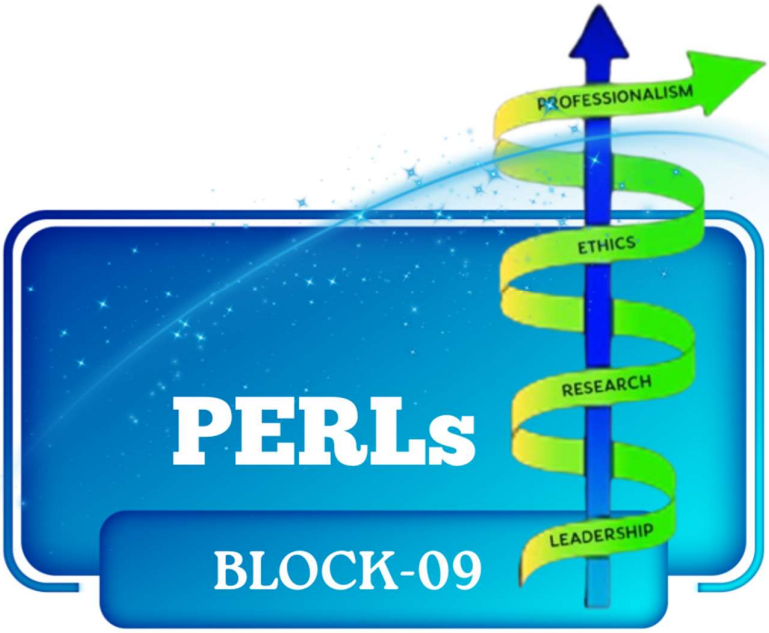
NEOPLASIA				
**Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block*				**Total Hours = 1.5**
*****Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-015	**Ethics**	Cultural/religious views on Do Not Resuscitate	• Explore the diverse cultural and religious perspectives on Do Not Resuscitate (DNR) orders and understand how these views influence end-of-life decisions in the context of neoplasia care.	Submit your hospital Protocol for Do-Not-Resuscitate.
PERLs-3-017	**Research**	Sample Selection	• Describe the principles of population selection in medical research. • Calculate sample size in medical research. • Evaluate how population and sample size affect validity and generalizability.	

INFECTIOUS DISEASES				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 06**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-018	**Professionalism**	Professional Responsibility in Public Health	• Recognize the professional duty of healthcare workers to protect vulnerable patients, colleagues, and the community by adhering to infection control protocols and promoting public health measures. Effectively communicate the risks and management strategies related to contagious diseases to patients and their families (i.e Tuberculosis) balancing public health concerns with individual patient rights and privacy.	Make a public awareness poster on infection control.
PERLs-3-019	**Ethics**	End-of-life decisions, ventilator use	• Explore the ethical considerations involved in end-of-life decisions, including using ventilators, balancing patient autonomy, family wishes, and medical judgment in making these decisions.	Write a case analysis on end-of-life decisions, particularly regarding ventilator use, and propose an ethically sound approach to decision-making.
PERLs-3-020	**Research**	Developing Research Hypotheses and Questions	• Understand the process of formulating research hypotheses and developing research questions, with a focus on creating clear, testable, and relevant questions using PICO • Formulate a research question and corresponding	Evidence of submitted research hypothesis/question to assigned Research Mentor.

			hypothesis based on a gap identified in the existing literature related to the research problem identified previously. • Submit a research proposal with a problem statement supported by a brief literature review, a well-defined research question and a hypothesis.	
PERLs-3-O21	**Research**	Research Design	• Classify various study designs with examples. • Explain the strengths and limitations of common study designs in medical research. • Evaluate and select an appropriate study design based on the research question.	

MUSCULOSKELETAL AND LOCOMOTION-II				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 06**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-O22	**Research**	Research approaches	• Differentiate between qualitative, quantitative, and mixed-methods research approaches.	
PERLs-3-O23	**Professionalism**	Adapting to the Physician's Role	• Appreciate the skills to adapt to the physician's role, including managing stress, handling uncertainty, and making clinical decisions, while demonstrating professionalism in diverse clinical settings.(skills include emotional resilience, critical thinking, communication, and time management)	Submit a reflective essay on a clinical experience where you applied these skills to manage stress, handle uncertainty, and make clinical decisions, proposing strategies to develop your adaptability further.
PERLs-3-O24	**Ethics**	Autonomy in rehabilitation, Informed consent	• Discuss the process of obtaining informed consent, ensuring patients are fully aware of their treatment options, risks, and potential outcomes. • Ensure the patient's autonomy is respected throughout the decision-making process.	Develop an Informed consent Sheet for patients undergoing rehabilitation after trauma.
PERLs-3-O25	**Leadership**	Entrepreneurship in Healthcare	• Discuss the basic principles of entrepreneurship in healthcare, including identifying gaps in healthcare services, understanding innovation, and exploring how	Propose an innovative solution that could address the gap or improve patient care, with a focus on how entrepreneurial thinking can be applied.

			entrepreneurial thinking can improve patient care and healthcare delivery. • Identify a gap or unmet need in the healthcare system (e.g., a service or technology that could improve patient outcomes) and suggest an innovative solution or approach.	


PROFESSIONALISM
ETHICS
RESEARCH
LEADERSHIP
PERLs
BLOCK-09

CARDIOVASCULAR-II				
**Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block*				**Total Hours = 1.5**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-O26	**Research**	Sample size	• Select a population for your research study. • Calculate an appropriate sample size, providing justification.	

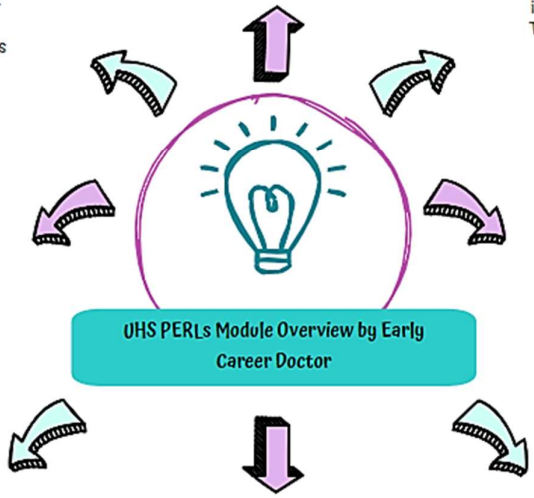
RESPIRATORY-II				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 4.5**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-O27	**Research**	Questionnaire development	• Identify variables and develop a questionnaire.	
PERLs-3-O28	**Ethics**	Ethical clinical trials, drug safety in trials	• Discuss the ethical considerations in clinical trials, including the importance of informed consent, patient safety, and drug safety throughout the trial process. • Discuss the importance of Clinical Trial Registration for Clinical Trials.	Provide recommendations on how the trial could better ensure ethical compliance and drug safety.

PERLs-3-O29	**Leadership**	Team Leadership	• Discuss the key qualities and skills required for effective team leadership in a healthcare setting, including communication, delegation, and conflict resolution, to foster a collaborative and efficient work environment. • Participate in a group project, take on the team leader role, and practice delegation, communication, and conflict resolution skills. Reflect on the challenges faced and strategies used to ensure team success	As a team, create a simple poster or video presentation on how you managed team dynamics to achieve project goals. Focus on key takeaways and provide basic recommendations for effective team leadership in healthcare settings.

COMMUNITY MEDICINE & FAMILY HEALTH-I				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				**Total Hours = 4.5**
***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.*				
Code	**Domain**	**Topic**	**Specific Learning Objectives**	**Proposed Portfolio Entry**
PERLs-3-030	**Ethics**	Health Equity: Resource allocation	• Understand the ethical principles behind resource allocation in healthcare, particularly in promoting health equity, and how decisions about resource distribution impact vulnerable populations.	Create a basic plan to distribute a limited supply of healthcare resources (e.g., vaccines, beds, or medications) in a community clinic. Explain how you would ensure fair treatment for everyone, especially vulnerable patients, and briefly discuss the ethical reasons behind your choices.
PERLs-3-031	**Leadership**	Role Modelling via Mentoring Session VII	• 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	Submit a summary of your mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth.
PERLs-3-032	**Research**	Research Proposal	• Prepare a research proposal including a problem statement supported by a brief literature review, a well-defined research question, a hypothesis.	
PERLs-3-033		IRB Approval	• Get the proposal approved by supervisor and submit to obtain IRB approval.	

STUDENT'S
GUIDE
PROFESSIONALISM
ETHICS
RESEARCH
LEADERSHIP

What your Seniors say



01

Phased Personal Development

The UHS PERLs module adopts a phased approach beginning with personal development and progressing toward professional identity formation. This logical progression helps cultivate a solid foundation and prepares students for their future roles as medical professionals.

02

Focus on Ethics

The ethics component emphasizes bioethics and research ethics. Including real-world case discussions and scenarios helps in solidifying ethical decision-making skills, providing students with practical understanding and insights into handling dilemmas faced in medical contexts.

03

Integration of Research skill building

The inclusion of the research module especially with capacity building and skill development is an innovative step that prepares students for the future. This exposure will equip them with contemporary skills essential for modern medical practices and competitive postgraduate competencies.

04

Hands-On Mentoring

Given the challenges in research, hands-on mentoring is critical. Guidance helps ensure students can balance research with clinical duties effectively, aiding them in integrating theoretical knowledge into practical settings smoothly and competitively.

05

Leadership Training

The leadership segment covers teamwork, entrepreneurship, and public health, addressing diverse aspects crucial for modern medical practice. Prioritizing these skills ensures holistic development, making students well-rounded professionals prepared for dynamic healthcare environments.

06

Continuous Feedback Loops

Embedded continuous mentoring and feedback mechanisms aid in professional identity development. These loops help students evaluate their progress and areas of improvement, fostering a learning environment conducive to personal and professional growth within the medical field.

07

Emphasis on Clinical Rotations

The module encourages active reflection during clinical rotations. This reflective practice aims to enhance skill application and real-time learning, ensuring that students are well-prepared to tackle the dynamic challenges they will face in real-world healthcare environments.

08

Impact on Career Competencies

The UHS PERLs module builds foundational competencies, preparing students for successful careers. Its innovative curriculum and practical focus ensure that graduates have the necessary skills and knowledge to compete globally and adapt to evolving healthcare demands.

Dr.Zil-e-Fatima Naeem
Medical Officer
Government City Hospital,
Toba Tek Singh, Punjab

INTRODUCTION

The UHS PERL Module is designed to equip medical students with essential competencies in Professionalism, Ethics, Research, and Leadership. This guide provides facilitators with an overview of the module, instructional strategies, and resources to effectively engage students in their learning journey.

MODULE STRUCTURE

5. **Professionalism**
    - **a.** Focus: Development of professional behavior and attitudes essential for medical practice.
    - **b.** Key Topics:
        - **i.** Professional identity formation
        - **ii.** Accountability and integrity
        - **iii.** Respect for diversity
6. **Ethics**
    - **a.** Focus: Understanding and applying ethical principles in healthcare.
    - **b.** Key Topics:
        - **i.** Virtue ethics and moral character
        - **ii.** Informed consent and patient autonomy
        - **iii.** Bioethics and clinical ethics
7. **Research**
    - a. Focus: Developing research skills and critical appraisal abilities.
    - b. Key Topics:
        - i. Basics of academic writing
        - ii. Literature searches and reviews
        - iii. Evidence-based medicine and research methodologies
8. **Leadership**
    - a. Focus: Enhancing leadership qualities and communication skills.
    - b. Key Topics:
        - i. Team dynamics and conflict resolution
        - ii. Patient counseling and informed consent
        - iii. Work-life balance and management skills

MODULE IDEOLOGY

The UHS PERLs module is designed to provide a comprehensive and integrated approach to developing essential competencies in Professionalism, Ethics, Research, and Leadership for medical students throughout their undergraduate training.

Professionalism Module

The Professionalism module begins with the foundational attributes of a professional student or doctor, focusing on intrapersonal skills in the first year. As students progress to the second and third years, the emphasis shifts toward interpersonal skills relevant to various domains, culminating in the formation of a Professional Identity in the fourth year. This progression ensures that students develop not only self-awareness but also the ability to interact effectively and ethically with patients and colleagues.

Ethics Module

The Ethics module initiates discussions on virtue ethics, emphasizing the virtues and moral character expected of medical students and professionals. In the second year, students delve into bioethics, followed by clinical ethics and research ethics in the third and fourth years. This structure helps students navigate the complexities of ethical dilemmas in medical practice, ensuring they are prepared to make informed, compassionate decisions that respect patient autonomy and promote justice.

Research Module

The Research module begins with the basics of academic writing, introducing students to the structure of a manuscript and critical appraisal through Journal Club Meetings and presentations in the first year. In the second year, the focus shifts to literature searches, summarization, and reviews, incorporating the use of artificial intelligence to enhance research capabilities. The third year introduces evidence-based medicine as a treatment guide in disease management, followed by research design, methodology, clinical audits, and patient safety, culminating in the development of a draft ethical approval proposal. This systematic approach equips students with the skills to conduct meaningful research and contribute to the advancement of medical knowledge.

Leadership Module

The Leadership module starts with personal qualities and communication skills in the first year, emphasizing the importance of effective interaction in healthcare settings. In the second year, the focus expands to teamwork dynamics, patient counseling, informed consent, conflict resolution, and work-life balance. The third year emphasizes management skills, including project management (aligned with research projects), entrepreneurship, and the use of innovation, such as AI in research and team leadership in healthcare setups. Finally, the fourth-year centers on professional identity, self-evaluation, digital transformation in healthcare, public health initiatives, health reforms, and advocacy. Throughout this module, mentoring sessions are integrated to provide role modeling and support, reinforcing the development of a strong professional identity among undergraduate MBBS students.

MODULE DEVELOPMENT AND VALIDATION

The UHS PERL module was developed through a scientific approach, involving the systematic identification of content via extensive literature searches, national and international guidelines, and recommendations from content contributors. This initial framework was presented to a panel of 10 invited experts in a modified e-Delphi round for validation.

During this process, the experts evaluated the module's content and provided constructive feedback, identifying areas for improvement. In the second round, a consensus was reached regarding the relevance of the module content, as well as its depth and scope tailored to the appropriate MBBS year.

Following the module development and validation, two independent reviewers were engaged to assess the sequencing and flow of the topics. Their review focused on ensuring logical coherence and identifying any additional revisions necessary to enhance the module's clarity and effectiveness. Further, the review was requested from an early career doctor who had recently graduated from an affiliated medical college in order to involve their suggestions for improvement.

This rigorous development and validation process ensures that the UHS PERL module meets the highest educational standards and effectively prepares medical students for their professional journey.

ASSESSMENT AND EVALUATION

- **Portfolio:** Throughout the module, you will be required to maintain a portfolio that includes reflections, case analyses, and evidence of your learning experiences. This portfolio will serve as a demonstration of your growth and understanding of the module content.
- **Participation**: Engage actively in discussions, group work, and role-playing exercises to enhance your learning and application of the concepts.

- **OSCE Exam:** At the end of the module, you will participate in an Objective Structured Clinical Examination (OSCE) as a summative assessment. This exam will evaluate your practical skills, including communication, clinical reasoning, and the application of professionalism and ethical principles in simulated patient scenarios along with leadership and research skills.

EVALUATION: YOUR FEEDBACK

As part of the UHS PERL module, we value your feedback to continually improve the learning experience. Your insights will help us understand the effectiveness of the module and identify areas for enhancement.

FEEDBACK AREAS:

1. **Module Content**:
    a. Was the content relevant and appropriate for your learning needs?
    b. Were the topics covered comprehensively?
2. **Teaching Methods**:
    a. Did the teaching methods (lectures, discussions, practical exercises) support your learning?
    b. How effective were the mentoring sessions in reinforcing your understanding?
3. **Assessments**:
    a. Did the assessments (portfolio, OSCE exam) accurately reflect your knowledge and skills?
    b. Were the expectations for the assessments clear and achievable?
4. **Resources**:
    a. Were the provided resources (reading materials, online tools) helpful for your learning?
    b. Is there any additional resource you would suggest?
5. **Overall Experience**:
    a. What aspects of the module did you find most beneficial?
    b. What suggestions do you have for improving the module in the future?

FEEDBACK SUBMISSION:

Please provide your feedback using the following format to the Department of Medical Education in your College:

- **Strengths**: What worked well?
- **Areas for Improvement**: What could be improved?
- **Additional Comments**: Any other thoughts or suggestions?

Your feedback is essential for refining the UHS PERL module and ensuring it meets the needs of future students. Thank you for your participation.

PEEL PORTFOLIO TEMPLATE

At the end of this guide, you will find the PEEL (Point, Evidence, Explanation, Link) portfolio template, which will help you structure your reflections and analyses effectively.

1. **Point**: State the main idea or point you want to discuss.
2. **Evidence**: Provide evidence or examples to support your point.
3. **Explanation**: Explain how the evidence relates to your point and its significance.
4. **Link**: Connect your point to broader themes in the module or your personal development.

CONCLUSION

The UHS PERL Module aims to equip you with the essential competencies needed to thrive as a future healthcare professional. Your engagement, critical thinking, and commitment to learning will be key to your success in this module. Embrace the challenges and opportunities for growth and make the most of the available resources and support.

Developed by

Dr. Noor-i-Kiran Naeem
Head of Department of Medical Education
ABWA Medical College, Faisalabad

Lt. Col. (R) Dr. Khalid Rahim Khan TI (M)
Ex-Director Medical Education
University of Health Sciences
Lahore

06
Section

UNIVERSITY OF HEALTH SCIENCES LAHORE
UHS
Modular Integrated Curriculum 2K23
MBBS Year-03
iF
EXPOSITORY
Volume: 03
Modular Integrated
Curriculum 2K23

Modular Integrated
YEAR-03
Curriculum 2K23
EXPOSITORY

Module Rationale

To integrate Expository Writing with an Introduction to Information Technology (IT) course for undergraduate medical students, we can align the IT skills taught each year with the writing tasks and objectives. The aim is to enhance students' digital literacy and writing skills, which is crucial for modern medical practice.

This integrated spiral of Expository Writing and IT ensures that as students advance in their medical education, they also develop digital literacy skills. These skills complement their writing abilities and prepare them for modern medical practice, where digital communication, research, and data management are essential. By the end of the 4-year program, students will be proficient in writing and using technology to support their work as healthcare professionals.

Year 3: Expository Writing III Research writing, data handling, and presentation skills			
THEORY			
Code	Subject: Expository writing & IT		Total Hours =10
	Specific Learning Outcome	Integrating Disciplines	Topics
EXP-03	**Expository Writing Focus:** 1. To use Advanced grammar for, sentence structure, and writing persuasive essays and case reports with medical evidence. 2. To write full-length review articles and case studies. **IT Integration:** **IT Skills:** 3. To use Excel& SPSS for Making tables, graphs, pie chats of medical data 4. To use AI Tools for creating professional presentations. **Writing Application:** 5. Learn to use tools (e.g., Excel) & SPSS for making managing patient data. 6. To create clear, visually appealing presentations for research projects using AI tools.	PERLS, Pharmacology, Community Medicine, Pathology, Forensic Medicine	• Writing essays and case reports with differential diagnosis • Introduction to Excel & SPSS for making tables, graphs, pie chats of medical data • Making Presentations with AI tools.

Developed by
Dr. Ambreen Khalid Professor of Physiology Central Park Medical College, Lahore **Lt. Col. (R) Dr. Khalid Rahim Khan TI (M)** Ex-Director Medical Education University of Health Sciences Lahore

Department of Medical Education

Innovating & Strategizing Healthcare Academia

07

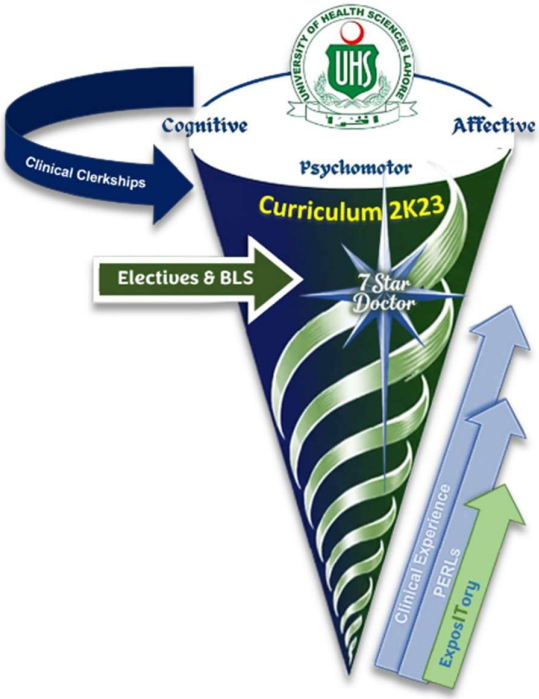
Section

Volume-03

STUDENT PORTFOLIO

YEAR-03

Curriculum 2K23 (MBBS Year-3)



MODULE: FOUNDATION II & EBM

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
A brief reflection on the key professional behaviours observed during the first clinical rotation session, noting how these behaviours contribute to patient care and professional conduct.	
Facilitator Remarks:	

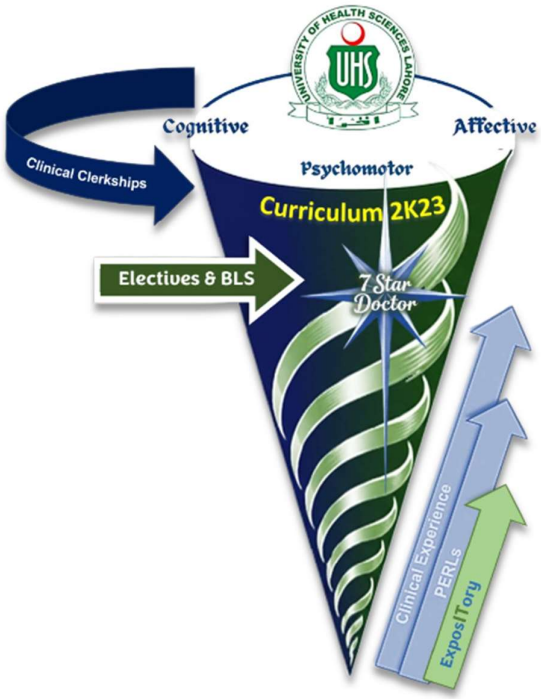
Roll No:	
Assignment Topic:	
Date:	
Create a case report detailing the application of EBP to a specific disease management scenario, including references to the literature.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Poster Submission of a medical error case, including both root cause analysis and a Swiss Cheese Model diagram that illustrates the alignment of system failures – along with proposed recommendations.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Submit a written incident report on a simulated or real medical error, including the ethical implications and actions taken.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Mentoring Session V Key decisions	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: GENERAL & CLINICAL PHARMACOLOGY

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

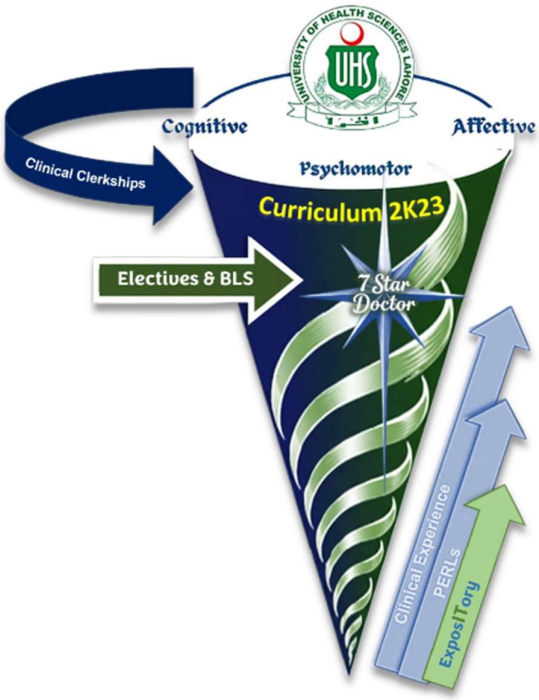
Roll No:	
Assignment Topic:	
Date:	
Develop and submit personal social media guidelines that reflect ethical use in professional and medical contexts.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
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.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Submit a literature review summary identifying key gaps in the research.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
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.	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: HEMATOPOETIC, IMMUNITY & TRANSPLANT

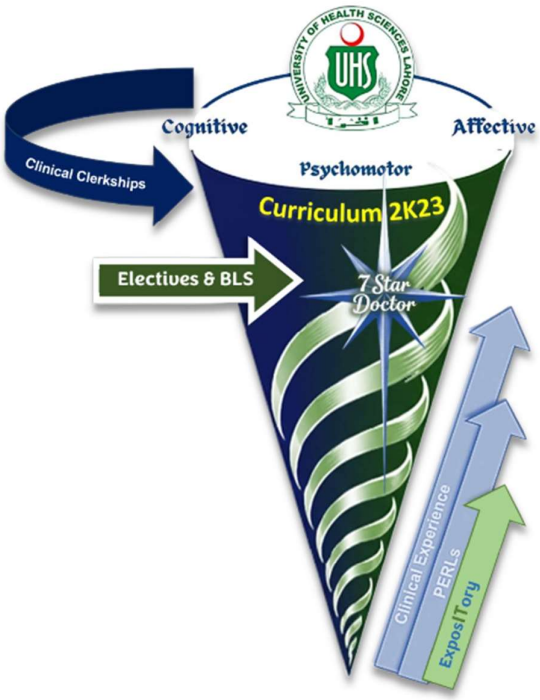
DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
Reflective entry on a clinical case where confidentiality was maintained, detailing the challenges and how they were addressed.	
Facilitator Remarks:	

Curriculum 2K23 Version 4.0



MODULE: FORENSIC MEDICINE & TOXICOLOGY-I

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
Case analysis of a malpractice incident, discussing the implications of human rights and detailing measures that could have been implemented to avoid the violation of patient rights.	
Facilitator Remarks:	

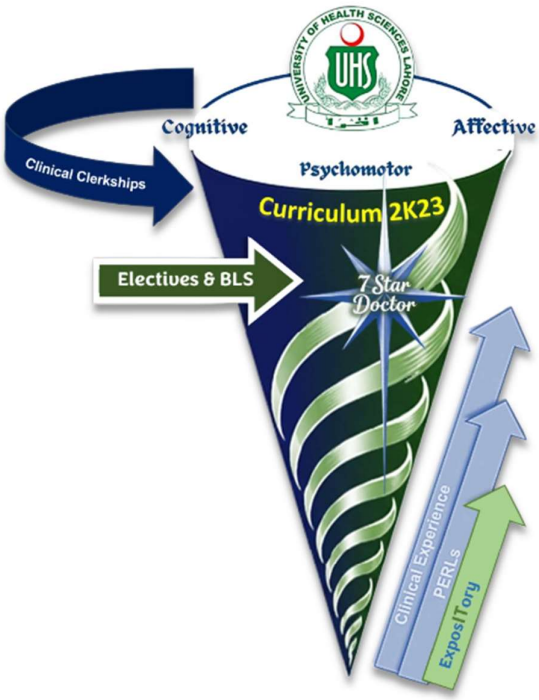
Roll No:	
Assignment Topic:	
Date:	
Review and submit the Patient Information Sheet/ Informed Consent Sheet of your College IRB and propose any improvement if needed.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Write a Class activity report with assigned roles taken by each group member. Critically evaluate the challenges observed with proposed recommendations.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Review and submit the Patient Information Sheet/ Informed Consent Sheet of your College IRB and propose any improvement if needed.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Write a Class activity report with assigned roles taken by each group member. Critically evaluate the challenges observed with proposed recommendations.	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: MUSCULOSKELETAL & LOCOMOTION-II

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

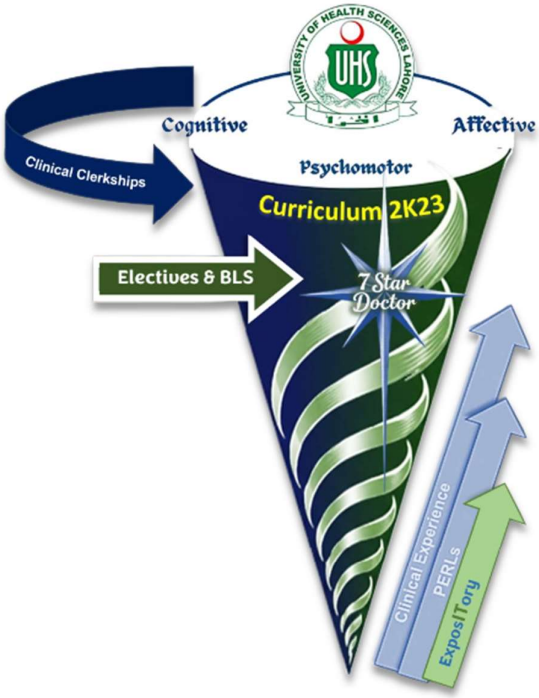
Roll No:	
Assignment Topic:	
Date:	
Evidence of submitted Research Problem to assigned Research Mentor.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Submit a reflective essay on a clinical experience where you applied these skills to manage stress, handle uncertainty, and make clinical decisions, proposing strategies to develop your adaptability further.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Develop an Informed consent Sheet for patients undergoing rehabilitation after trauma.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Propose an innovative solution that could address the gap or improve patient care, with a focus on how entrepreneurial thinking can be applied.	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: INFECTIOUS DISEASES

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

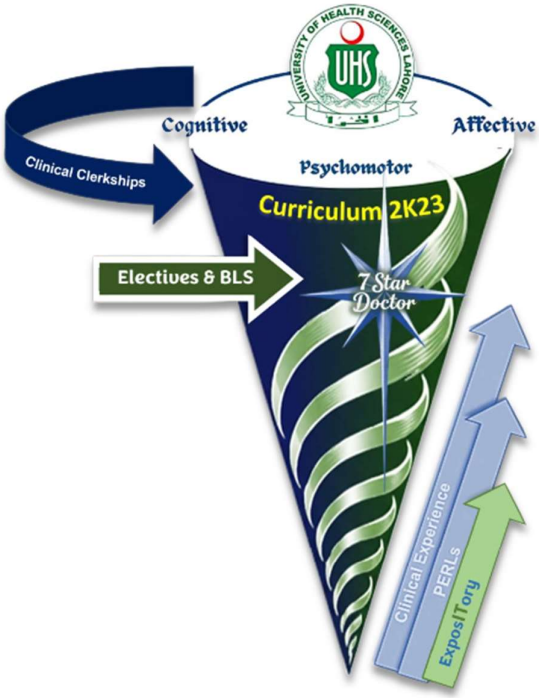
Roll No:	
Assignment Topic:	
Date:	
Make a public awareness poster on infection control.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Write a case analysis on end-of-life decisions, particularly regarding ventilator use, and propose an ethically sound approach to decision-making.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Evidence of submitted research hypothesis/question to assigned Research Mentor.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Submit a summary of your progress from your last mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth. Submit a brief reflection on an infection control practice you observed during your	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: NEOPLASIA

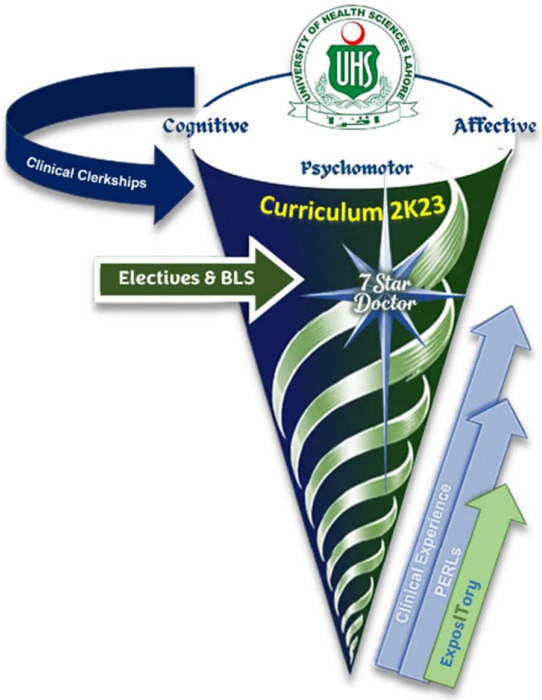
DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
Submit your hospital Protocol for Do-Not-Resuscitate.	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: CARDIOVASCULAR-II

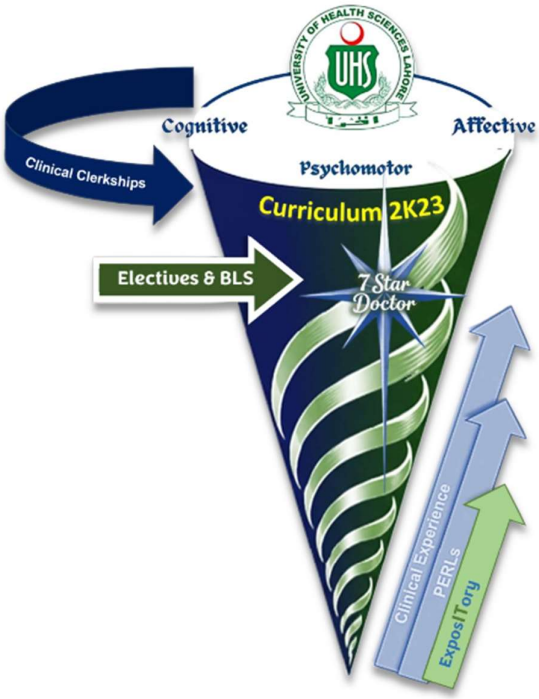
DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
Evidence of submitting Research population selection and size calculation to Research Mentor.	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: RESPIRATORY-II

DATE FROM: _____

DATE TO: _____

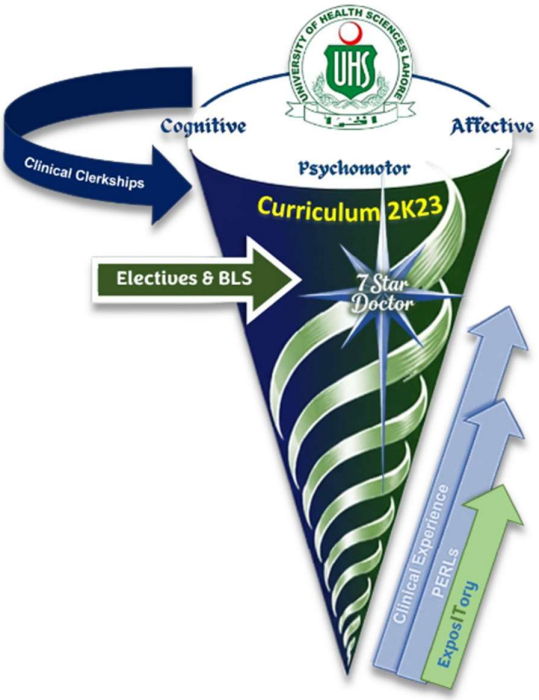
CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
Evidence of submitting Research population selection and size calculation to Research Mentor.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Provide recommendations on how the trial could better ensure ethical compliance and drug safety.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
As a team, create a simple poster or video presentation on how you managed team dynamics to achieve project goals. Focus on key takeaways and provide basic recommendations for effective team leadership in healthcare settings.	
Facilitator Remarks:	

Curriculum 2K23 (MBBS Year-3)



MODULE: COMMUNITY MEDICINE & FAMILY HEALTH-I

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	
Date:	
Create a basic plan to distribute a limited supply of healthcare resources (e.g., vaccines, beds, or medications) in a community clinic. Explain how you would ensure fair treatment for everyone, especially vulnerable patients, and briefly discuss the ethical reasons behind your choices.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Submit a summary of your mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth.	
Facilitator Remarks:	

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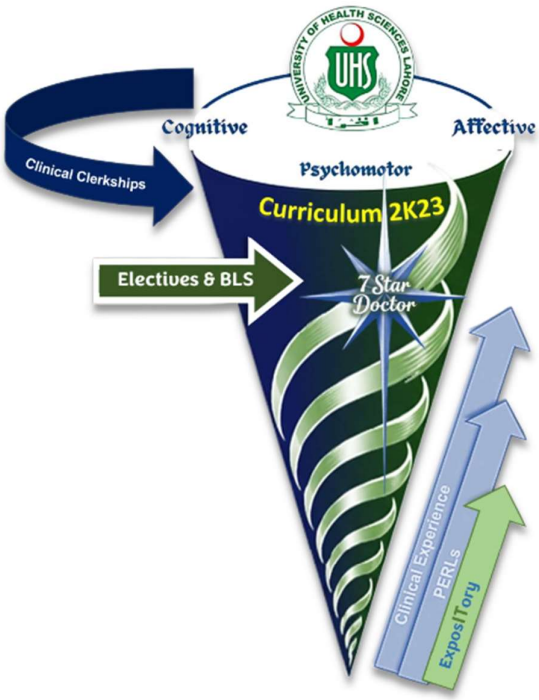

MODULE: Expository Writing III & Data Management IT Skills

DATE FROM: _____

DATE TO: _____

CHECKED BY: _____

Roll No:	
Assignment Topic:	Persuasive Essay Submission
Date:	
Submit essays that showcase advanced grammar and persuasive writing techniques. (Include a focus on building logical arguments supported by medical evidence.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	Case Report with Differential Diagnosis
Date:	
Write and include a detailed case report that demonstrates critical thinking and differential diagnosis. The report should reflect the integration of clinical knowledge with effective writing practices.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	Full-length Review Article
Date:	
Write a comprehensive review article on a relevant medical topic. Include drafts and revisions to show the progression of work and the application of feedback.	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
Attach reports showcasing the use of Excel and SPSS for creating tables, graphs, and pie charts from a set of medical data. Ensure that the report demonstrates correct data handling and visual representation.	
Facilitator Remarks:	

08

Section

SKILL ACQUISITION WORKSHOPS

Workshop Schedule for MBBS students

The Following **Life Saving Workshops** are included in the "Modular Integrated Curriculum 2K23'' *final versionp:*

Sr. No.	Course Name	Academic Year	Duration
1.	Cardiac First Response (CFR) /Basic Life Support (BLS)	1st Year	2 days
2.	Immediate Care Cardiac (ICC) / Advanced Life Support Cardiac (ALSC)	2nd Year	1 day
3.	Immediate Care Trauma (ICT) / Advanced Life Support Trauma (ALST)	3rd Year	1 day
4.	Emergency Triage and Assessment (ETAT)	4th Year	1 day
5.	Emergency Neonatal Care (ENC)/ Neonatal Resuscitation (NR)	5th Year	1 day
6.	Emergency Obstetrics and Neonatal Care (EMONC)	5th Year	1 day

University of Health Sciences Lahore

Department of Medical Education

Innovating & Strategizing Healthcare Academia