STUDY GUIDE

Block - VIII

I. Neoplasia
II. Infectious Diseases
III. Musculoskeletal & Locomotion - II
IV. Forensic Medicine & Toxicology - II

3rd Year MBBS

Department of Medical Education

Aziz Fatimah Medical & Dental College

Faisalabad

Table of Contents

1. List of Abbreviations

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

C. burnetii	Coxiella burnetii
C. neoformans	Cryptococcus neoformans
C. pneumoniae	Chlamydia pneumoniae
C. psittaci	Chlamydia psittaci
C. trachomatis	Chlamydia trachomatis
CA	Cancer
CABG	Coronary Artery Bypass Grafting
CAD	Coronary Artery Disease
CBC	Complete Blood Count
CCR5	Cysteine-Cysteine Chemokine Receptor 5
CD31	Cluster of Differentiation 31
CD34	Cluster of Differentiation 34
CD4	Clusters of Differentiation 4
CF	Cystic Fibrosis
CK	Creatine Kinase
CK	Creatine Kinase
CLED	Cystine Lactose Electrolyte Deficient
CLL	Chronic Lymphocytic Leukemia
CM	Community Medicine
CML	Chronic Myelogenous Leukemia
CMV	Cytomegalovirus
CNS	Central Nervous System
CO	Carbon Monoxide
CO2	Carbon Dioxide
CODIS	Combined Dna Index System
COPD	Chronic Obstructive Pulmonary Disease
COVID-19	Corona Virus Disease 2019
COX	Cyclooxygenase
CPR	Cardio Pulmonary Resuscitation
CR	Clinical Rotation
CRP	C- Reactive Protein

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

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

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

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

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

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

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

2. Introduction to Study Guide

The study guide serves several crucial purposes:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Block–8 Module Committee

BASIC HEALTH SCIENCES	CLINICAL SCIENCES
Anatomy: Prof. Dr. Quddus Ur Rehman	**Medicine:** Prof. Dr. Ghulam Abbas Sheikh
Physiology: Prof. Dr. Qamar Mehbob	**Surgery:** Prof. Dr. Asrar
Biochemistry: Prof. Dr. Shakeel Ahmad	**Radiology:** Asst. Prof. Dr. Shemona
Community Medicine: Prof. Dr. Humayun Suqrat	**Gynecology:** Prof. Dr. Nazia Musarrat
Pathology: Prof. Dr. Kashif Baig	
Pharmacology: Dr. Sarwat Jahan	
Behavioral Sciences: Dr. Yawar	

Block Coordinator	**Dr Amna**
Medical Educationist	**Asst. Prof. Dr. Ayesha Sadiq**
Principal AFMDC	**Prof. Dr. Ghulam Abbas Sheikh**

4. Introduction of BLOCK VIII

Block 8 of the 3rd Year MBBS curriculum is a comprehensive and integrated academic unit that brings together four vital modules: Neoplasia, Infectious Diseases, Musculoskeletal & Locomotion II, and Forensic Medicine & Toxicology II. The block is designed to provide a multidisciplinary understanding of disease processes, enhance diagnostic thinking, and build a strong foundation for clinical practice.

Neoplasia

This component focuses on the study of abnormal and uncontrolled cell growth that leads to tumor formation. Students will learn about the classification of tumors into benign and malignant types, mechanisms of carcinogenesis, tumor biology, genetic and environmental risk factors, and modern approaches to cancer diagnosis and treatment. Emphasis is placed on understanding the molecular basis of cancer and its implications in clinical oncology.

Infectious Diseases

The Infectious Diseases module introduces students to the etiology, pathogenesis, clinical features, and management of infections caused by bacteria, viruses, fungi, and parasites. It emphasizes the importance of infection control, antimicrobial stewardship, and the role of vaccination and public health measures in preventing the spread of communicable diseases. Real-world clinical scenarios are used to develop practical decision-making skills.

Musculoskeletal & Locomotion II

This module continues the exploration of the human musculoskeletal system, focusing on more advanced concepts related to bones, joints, muscles, and connective tissues. Students will study common orthopedic and rheumatologic disorders, their pathophysiology, clinical presentations, and relevant investigations. The module also integrates surface anatomy, imaging techniques, and physical examination skills to support clinical application.

Forensic Medicine & Toxicology II

In this section, students are introduced to the medico-legal aspects of clinical practice. Topics include identification of the deceased, post-mortem changes, cause of death, and the legal responsibilities of physicians. The toxicology component covers the recognition, diagnosis, and management of poisoning cases, along with the forensic implications of drug and

chemical exposure. Ethical and legal issues in medical practice are also addressed, preparing students for real-world responsibilities.

NEOPLASIA

5. Neoplasia

5.1 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

5.2 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

5.3 Learning Objectives

5.3.1 Knowledge

PATHOLOGY

Code	Topic	Sub Topic	Learning Objectives
N-Pa-001	**Pathology**	Nomenclature. Benign and malignant tumours.	Define neoplasia, Nomenclature and difference between benign and malignant tumors based on morphological and functional characteristics and epidemiology of cancer.
N-Pa-002		Difference between carcinoma and sarcoma and pathways of spread of malignant tumours.	Understand the molecular basis of cancer and pathogenesis of neoplasia, including the role of genetic mutations, oncogenes, tumor suppressor genes, mechanisms of cell cycle dysregulation, apoptosis evasion, angiogenesis in tumor progression and metastasis Differentiate Carcinomas, Sarcomas and lymph reticular neoplasm
N-Pa-003		Carcinogenesis	Carcinogenic agents with their cellular interactions.
N-Pa-004		Tumor markers	Describe the role of diagnostic tools like biopsy, histopathology with IHC (Immuno-histochemistry) and special stains and molecular diagnostics with common tumor markers.
N-Pa-005		Grading and Staging Invasion and metastasis	Grading and staging of tumors and treatment strategies.
			Understand the concept of invasion and metastasis
			Basic tumor markers
N-Pa-006		Molecular basis of cancer	Molecular basis of cancer

N-Pa-007		Paraneoplastic syndrome	Define and describe Paraneoplastic syndrome and associate with neoplastic lesions.

BEHAVIOURAL SCIENCES

Code	Topic	Sub Topic	Learning Objectives
N-BhS-001	**Behavioural Sciences**	Psychosocial aspect of oncology / cancer	**1.** Discuss improvement in quality of life, holistic care for terminal cancer patient **2.** Discuss palliative care (pain management, psychological support). **3.** Understand the importance of mental health support for cancer patients.

BIOCHEMISTRY

Code	Topic	Sub Topic	Learning Objectives
N-B-001	**Biochemistry**	Oncology / cancer	**1.** Discuss molecular changes in oncogenes, tumor, suppressor genes, and apoapsis mechanism. **2.** Explain Role of epigenetics in cancer development

RADIOLOGY

Code	Topic	Sub Topic	Learning Objectives
N-M-001	**Medicine**	Introduction	**1.** Introduction to Radiological Modalities in Oncology **2.** Understand the different radiological imaging techniques used in cancer management: **3.** X-rays

			4. Ultrasound **5.** CT scans (Computed Tomography) **6.** MRI (Magnetic Resonance Imaging) **7.** PET scans (Positron Emission Tomography) **8.** Mammography
N-Ra-001		Role of Imaging	**1.** Role of Imaging in Cancer Detection and Diagnosis **2.** Identify radiological signs of cancer in different imaging modalities. **3.** Understand how imaging assists in detecting primary tumors and metastasis. **4.** Compare the sensitivity and specificity of different imaging techniques in diagnosing various types of cancer (e.g., CT vs. MRI for Brain tumors).
N-Ra-002		Imaging	**1.** Imaging in Cancer Staging: **2.** Learn the importance of imaging in staging cancer (TNM system). **3.** Understand how radiological imaging helps determine the extent of local, regional, and distant disease spread. **4.** Role of CT, MRI, and PET scans in staging cancers like lung cancer, breast cancer, and colorectal cancer.
			1. Imaging-Guided Procedures **2.** Introduction to imaging-guided diagnostic procedures (e.g., CT or ultrasound-guided biopsy). **3.** Learn how interventional radiology

			aids in both diagnosis and treatment, such as tumor ablation and drainage procedures.
			1. Imaging in Treatment Planning: **2.** Role of imaging in planning surgical interventions, radiotherapy, and other treatments. **3.** Understand how imaging assists in monitoring tumor size, location, and response to therapy. **4.** Discuss the use of PET/CT scans in assessing the metabolic activity of tumors to guide treatment decisions.
N-Ra-003		Follow up & monitoring	**1.** Follow-up and Monitoring **2.** Importance of radiological imaging in follow- up after cancer treatment (e.g., detecting recurrence or metastasis). **3.** Learn how imaging changes guide alterations in treatment plans. **4.** Understand the concept of surveillance imaging for cancer patients in remission.
N-Ra-004		Complications	Radiological Signs of Cancer Complications. Recognize radiological findings associated with complications like: **1.** Tumor obstruction **2.** Bone metastasis **3.** Brain metastasis **4.** Vascular invasion or thrombosis

PHARMACOLOGY

Code	Topic	Sub Topic	Learning Objectives
N-Ph-001	**Pharmacology**	Cell cycle	Patho physiology cell cycle
			Abnormalities in cell cycle leading to oncogenesis
N-Ph-002		Cell Cycle specific and non-specific anti-tumour agent	Cell Cycle specific and non-specific anti-tumour agent mechanism of action, adverse effect, indication drugs interaction of various class of chemotherapeutic agents.
			Drugs for palliative therapy in various tumours
			Drugs related with rehabilitation.
			Drugs used during phases of radiotherapy e.g. tumour lysis syndrome
			Drugs used beside surgical resection of various tumour to treat complications.
			Glucocorticoids as part of various anti-cancer cocktails

SURGERY

Code	Topic	Sub Topic	Learning Objectives
N-S-001	**Surgery**	Principles of oncologic surgery	**1.** Understand the principles of oncologic surgery, including when and how surgery is indicated during the treatment **2.** Identify role of surgery, techniques, and indicators for curative and palliative surgery.

COMMUNITY MEDICINE

Code	Topic	Sub Topic	Learning Objectives
N-CM-001	**Community Medicine**	Screening /prevention	**1.** Define cancer screening and its important **2.** Explain methods of screening for common cancers Major risk factors for cancer. **3.** Preventive and control measures.

MEDICINE / ONCOLOGY

Code	Topic	Sub Topic	Learning Objectives
N-M-002	**Medicine & oncology**	Presenting problems	**1.** Presenting Problems of Cancer Patients and clinical examination of patients on Cancer Treatment Understand the examination (important clinical signs of patients with cancer)
N-M-003		Risk factors	**1.** Risk factors for Cancer Development **2.** Understand and interpret the environment and genetic factors involved in Cancer development
N-M-004		Investigation	**1.** Investigations in Cancer patients **2.** Will be able to understand & interpret various investigations required for Cancer patients
N-M-005		Paraneoplastic syndrome	**1.** Oncological Emergencies & Paraneoplastic syndrome **2.** Understand & interpret various ecologic emergencies, metastasis of tumours, and Paraneoplastic
N-M-006		Therapeutics	**1.** Therapeutic in Oncology Will be

			able to understand and Interpret Various **2.** Therapeutic options like surgery, radiotherapy, chemotherapy, and palliative.

5.3.2 Practical / Lab Work

PATHOLOGY

Code	Topic	Sub Topic	Learning Objectives
N-Pa-008	**Pathology**	Nomenclature, Difference between benign and malignant tumours	Morphological features of Benign and Malignant tumours (Gross and Microscopic features)
			Common Benign tumours (Lipoma, Leiomyoma, Fibro adenoma of Breast)
			Carcinoma in situ (DCIS & Bowens disease)
			Common Malignant tumours (Adenocarcinoma, Squamous cell carcinoma)
N-Pa-009		Clinical aspects of Neoplasia	Tumour grade and stage in malignant tumours Adenocarcinoma / Squamous cell carcinoma (including tumour invasion and metastasis)

INFECTIOUS DISEASES

6. Infectious Diseases

6.1 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.

6.2 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.

6.3 Learning Objectives

6.3.1 Knowledge

MICROBIOLOGY

Code	Topic	Sub Topic	Learning Objectives
ID-Pa-001	**Surgery** **Microbiology**	Bacterial infectious agents	Explain the morphological, pathological and diagnostic aspects of: **1.** Staphylococci. **2.** Streptococci **3.** Clostridia **4.** Bacillus **5.** Corynebacterium **6.** Listeria and Gardnerella
	Microbiology		Explain the morphological, pathological and diagnostic aspects of; **1.** Gonococci and meningococci **2.** E. coli and salmonella, **3.** Shigella, vibrio, proteus, **4.** Pseudomonas, H.pylori , campylobacter **5.** Spirochetes, Mycobacteria **6.** Chlamydia, rickettsia, actinomycetes
ID-Pa-002	**Microbiology**	Parasitic infectious agents	Explain the life cycles and diagnostic aspects of; **1.** W. bancrofti, D.medinensis, loa **2.** Tenia saginata, tenia solium, echinococcus granolosus, D.latum, H.nana **3.** Giardia, entamoeba and plasmodium **4.** Leishmania, toxoplasma, trypanosomes, naegleria.

ID-Pa-003	**Microbiology**	Fungal infections	Explain the morphological, pathological and diagnostic aspects of ; **1.** Dermatophytes, malassezia fur, Spoorthi, Histoplasma Explain the morphological, pathological and diagnostic aspects of ; **1.** coccidioiodes, paracoccidioiodes, blastomyces, candida, mucor, aspergillus, cryptococcus
ID-Pa-004	**Microbiology**	Viral infectious agents	Explain the morphological, pathological and diagnostic aspects of; **1.** Adeno virus, papilloma virus, polyoma virus, papova virus **2.** Pox virus, herpes, hepadna **3.** Picornavirus, hepevirus, calicivirus, reovirus
			Explain the morphological, pathological and diagnostic aspects of; **1.** Retrovirus, flaviviruses, toga viruses **2.** Coronavirus, delta virus, paramyxovirus, rhabdovirus, orthomyxovirus, filovirus
ID-Pa-005	**Microbiology**	Microorganisms producing CNS infections	Enlist organisms producing CNS infections.
			Correlate clinically the following bacteria via their virulence factors, transmission, pathogenesis, laboratory diagnosis in CNS infections; **1.** Strept. pneumonia **2.** Strept. agalactiae **3.** Nisseria meningitides **4.** Haemophilus influenzae **5.** E. coli

			6. L. monocytogenes **7.** Mycobacterium tuberculosis
			Correlate clinically the following microbes via their virulence factors, transmission, pathogenesis, laboratory diagnosis in CNS infections; **1.** Enteroviruses **2.** Mumps **3.** Herpes simplex Adenovirus **4.** C. neoformans **5.** Rabies **6.** Herpes simplex **7.** Malaria **8.** Toxoplasma **9.** Negleria
			Compare CSF findings of viral and bacterial meningitis
ID-Pa-006	**Microbiology**	Microorganisms producing GIT infections	Enlist organisms producing diarrhea & food poisoning.
	Microbiology integrates with medicine		Correlate clinically the following microbes via their virulence factors, transmission, pathogenesis, laboratory diagnosis in GIT infections; **1.** E. coli **2.** B.cereus **3.** Salmonella **4.** Shigella **5.** Vibrio cholera & other Vibrio species **6.** Helicobacter pylori **7.** Campylobacter jejuni **8.** Clostridium species **9.** Entamoeba histolytica

	Microbiology integrates with medicine		Correlate clinically the following microbes via their virulence factors, transmission, pathogenesis, laboratory diagnosis in GIT infections **1.** Giardia lamblia **2.** Cryptosporidium parvum **3.** Diphyllobathrium latum **4.** Hymenolepis nana **5.** Ancylostoma duodenal **6.** Necator americanus **7.** Ascaris lumbricoides **8.** Entrobius vermicularis **9.** Trichiuris trichiura Trichinella spiralis **10.** Polio **11.** Hepatitis A, E **12.** Norwalk & Rotavirus
	Microbiology		Correlate clinically the following viruses via their virulence factors, transmission, pathogenesis, laboratory diagnosis in acute & chronic hepatitis; A, B, C, D, E, G
			Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of Entamoeba & Echinococcus in liver infections.
ID-Pa-007	**Microbiology integrates with medicine**	Sexually transmitted infections	Correlate clinically the virulence factors, transmission, pathogenesis, laboratory diagnosis of organism causing genital tract infections; **1.** Nisseria gonorrhea **2.** Treponema pallidum **3.** Chlamydia trachomatis

			4. Mycoplasma hominis **5.** Candida albicans **6.** Trichomonas vaginalis **7.** Gardnerella vaginalis **8.** Hepatitis B **9.** HIV **10.** Herpes simplex –II
ID-Pa-008	**Microbiology**	Zoonotic infections	Discuss important properties of: **1.** Rickettsia, **2.** Leptospira& Brucella, anthrax, plague. **3.** Francis Ella, bartonella

PHARMACOLOGY

Code	Topic	Sub Topic	Learning Objectives
ID-Ph-001	**Pharmacology**	Cell Wall Inhibitors	Classify cell wall synthesis inhibitors.
			Discuss the mechanism of action of beta lactam Antibiotics (Penicillin G, V, Oxacillin, Nafcillin, Ampicillin, Amoxicillin, and Piperacillin).
			Delineate the mechanism of resistance to beta lactam antibiotics.
			Enlist the major adverse effects of penicillin
			Differentiate the clinical uses of beta lactam antibiotics.
			Discuss the mechanism of action and clinical significance of Beta Lactamase Inhibitors (Clavulanic acid, Sulbactam, Tazobactam, Avibactam, Vaborbactam)
			Classify cephalosporin generations
			Describe their antibacterial spectrum and

			clinical uses.
			Differentiate the clinical uses of cephalosporin generations
			List the major adverse effects of cephalosporin.
			Describe important features of the carbapenems and monobactam.
			Describe the mechanism of action of Membrane active antibiotics (daptomycin, Fosfomycin, bacitracin, cycloserine).
			Describe the mechanism of resistance of Membrane active antibiotics.
			Describe the adverse effects and toxicities of Membrane active antibiotics.
			Describe antibacterial spectrum, mechanism of action, resistance, clinical uses and toxicity of vancomycin.
	Medicine		Discuss clinical features of Redman Syndrome.
			Describe antibacterial spectrum, mechanism of action of Teicoplanin, Telavancin, Delbavancin, and Oritavancin.
ID-Ph-002	**Medicine**	Protein Synthesis Inhibitors	Explain briefly the major steps of protein synthesis.
			Classify protein synthesis inhibitors.
			Demonstrate the tetracycline and discuss mechanism of action, resistance, antibacterial spectrum, clinical uses, and adverse effects of tetracycline.
			Outline features of Milk Alkali

			Syndrome
			List pharmacological indication and adverse effects of Glycylcycline.
			Classify Macrolide/ Ketolide.
			Describe the mechanism of action and pharmacokinetics, antimicrobial spectrum, clinical uses, adverse effects of Erythromycin, Clarithromycin, Azithromycin, and Fidaxomycin.
			Enlist mechanism of resistance & drug interactions of Macrolides.
			Describe the antibacterial spectra, therapeutic uses and side effects of Ketolide (Telithromycin, solithromycin)
			Discuss the main characteristics of Clindamycin including mechanism of action, pharmacokinetics, clinical uses and adverse effects.
			Explain Chloramphenicol with respect to its: mechanism of action, resistance, antibacterial spectrum, pharmacokinetics, clinical uses and adverse effects.
	Integrate with pediatrics		Describe Gray Baby Syndrome.
			Enlist major pharmacokinetic characteristics of Streptogramins (Quinupristin / dalfopristin).
			Classify Ant folate drugs.
			Define Sulfonamides.
			Discuss the classification of Sulfonamides.
			Describe the mechanism of action of Sulfonamides.

			Discuss the clinical uses of Sulfonamides.
			Describe the adverse effects and toxicities of Sulfonamides.
			Outlineclinicalfeatures of Steven Johnsons Syndrome.
	Integrate with Medicine		Explain Trimethoprim & Trimethoprim - Sulfamethoxazole with respect to their mechanism of actions, resistance, antibacterial spectrum, pharmacokinetics, clinical uses and adverse effects
			Define Aminoglycosides.
			Classify Aminoglycosides.
			Describe the mechanism of action of Aminoglycosides (amikacin, gentamycin, streptomycin, tobramycin, neomycin, and kanamycin).
			Describe the mechanism of resistance of Aminoglycosides.
			Discuss the clinical uses of Aminoglycosides.
			Describe the adverse effects and toxicities of Aminoglycosides.
			Discuss ototoxicity and nephrotoxicity of Aminoglycosides
			Define DNA Gyrase Inhibitors.
			Discuss the classification of DNA Gyrase Inhibitors.
			Describe the mechanism of action of DNA Gyrase Inhibitors (Ciprofloxacin, Levofloxacin, Ofloxacin, Getifloxacin and others)

			Describe the mechanism of resistance of DNA Gyrase Inhibitors.
			Discuss the clinical uses of DNA Gyrase Inhibitors.
ID-Ph-003	**Integrate with Medicine**	Antituberclous Therapy (ATT)	Briefly describe the signs, symptoms, diagnosis of tuberculosis.
			Classify ant tuberculosis drugs into 1st line and 2nd line agents with examples.
	Integrate with Community Medicine		Describe standard protocols (WHO recommendation) for management of newly diagnosed pulmonary tuberculosis, multidrug-resistant tuberculosis, laten tuberculosis.
			Delineate the characteristic pharmacodynamics and pharmacokinetic properties of Rifampin, Isoniazid, Ethambutol and Pyrazinamide.
			Discuss the adverse effects of 1st line ant tuberculosis drugs.
			Describe how to monitor patients during ant tuberculosis drug therapy.
			Discuss 2nd line drugs used in treatment of Multidrug resistant tuberculosis with their therapeutic and adverse effects.
ID-Ph-004	**Integrate with Community Medicine**	Drugs used in Leprosy	Explain standard protocols (WHO recommendation) for management of leprosy
			Describe the characteristic properties of dapsone and clofazimine with their adverse effects.
ID-Ph-005	**Integrate with Community Medicine**	Antiprotozoal Drugs	Classify Antiprotozoal Drugs.
			Discuss the classification of Antimalarial agents.

			Describe the mechanism of action of Antimalarial agents.
			Describe the mechanism of resistance of Antimalarial agents.
			Discuss the clinical uses of Antimalarial agents.
			Describe the adverse effects and toxicities of Antimalarial agents.
			Discuss the main characteristics of antiprotozoal drugs used in amoebiasis & giardiasis including mechanism of action, pharmacokinetics, clinical uses and adverse effects.
			Discuss the main characteristics of antiprotozoal drugs used in treatment of Leishmaniosis.
			Discuss the main characteristics of antiprotozoal drugs used in treatment of Trypanosomiasis.
ID-Ph-006	**Integrate with Medicine / Pead's**	Anti-Helminthic Drugs	Classify anti-helminthic drugs.
			Discuss drugs used for the treatment of Nematodes.
			Explain mechanisms of action, clinical uses, adverse effects of Mebendazole, Pyrantel pamoate, Piperazine, Diethylcarbamazine & Ivermectin.
			Discuss drugs used for the treatment for Tape worm (cestodes) infection.
			Explain mechanisms of action, clinical uses, and adverse effects of drugs used in cestodes infections.
			Distinguish the drugs used for the treatment of Cestodes infection based on

			their characteristics and therapeutic uses.
	Medicine / Pead's		Discuss drugs used in treatment of Neurocystocerciosis.
ID-Ph-007	**Medicine / Pead's**	Antifungal Drugs Classification	Classify antifungal drugs.
			Discuss drugs used for systemic mycotic infections.
			Discuss effects of Amphotericin B.
			Explain the mechanism of action, uses and adverse effects of flu cytosine.
			Classify Azole antifungal drugs.
			Discuss mechanism of action, resistance, antifungal spectrum, pharmacokinetics, clinical uses, adverse effects and drug interactions of Azole antifungal drugs.
			Describe important pharmacologic properties of echinocandins.
			Discuss the drugs used for Mucocutaneous mycotic infections.
			Discuss mechanism of action, resistance, antifungal spectrum, pharmacokinetics, clinical uses, adverse effects and drug interactions of Griseofulvin. And Terbinafine.
			Discuss the drugs used for cutaneous mycotic infections / Topical agents.
			Discuss mechanism of action, resistance, antifungal spectrum, pharmacokinetics, clinical uses, adverse effects of drugs used in cutaneous mycotic infections.
			Discuss mechanism of action, resistance, antifungal spectrum, pharmacokinetics, clinical uses, and adverse beffects of Nystatin.

ID-Ph-008	**Medicine / Pead's**	Antiviral Agents	Discuss the main steps of viral replication that are targets for antiviral drugs.
			Describe drugs used in treatment of herpes simplex and varicella zoster virus infection with their properties.
			Explain the mechanism of action, pharmacodynamics and adverse effects of acyclovir, Val acyclovir and famciclovir.
			Explain the mechanism of action, pharmacodynamics and adverse effects of agents used in cytomegalovirus infection.
			Classify antiretroviral agents.
			Discuss mechanism of action, resistance, pharmacokinetics, clinical uses, adverse effects of NRTIs, NNRTIs, PIs, INSTIs, Fusion inhibitors, CCR5 coreceptor antagonist, CD4 post-attachment inhibitors
			Demonstrate the standard protocol for treatment of hepatitis B and C
			Describe pharmacodynamics and adverse effects of interferon, entacavir, tenofovir, ribavirin and others.
			Describe the mechanism of action of drugs used in treatment of COVID-19 and influenza along with their adverse effects.
			Briefly discuss antiretroviral drug used in treatment of HIV AIDS.
			Describe the significant characteristics of

			the five groups of drugs used in HIV AIDs.

COMMUNITY MEDICINE

Code	Topic	Sub Topic	Learning Objectives
ID-CM-001	**Integrate with Microbiology**	Tuberculosis	**1.** Analyze the local & global burden of Tuberculosis **2.** Identify the risk factors of TB
			Identify prevention and control measures for Pulmonary TB in line with WHO strategies for control of TB
			Appreciate significance of TB DOTS therapy for TB control
ID-CM-002		Hepatitis	Discuss the global burden of hepatitis
			Discuss the importance of awareness & screening of hepatitis.
			Analyze effective prevention methods for each type of hepatitis.
			Discuss role of vaccination
			Explain public health initiatives for prevention and control of hepatitis.
			Describe the measures for prevention of vertical transmission of Hep B virus from mother to child transmission.
ID-CM-003		Polio	Evaluate the Global Polio Eradication Initiative
			Analyze the historical and current global impact of poliomyelitis vaccination efforts.
			Evaluate the effectiveness of different poliovirus vaccines (OPV and IPV) and vaccination schedules.

			Discuss community health strategies for poliovirus surveillance, outbreak response & vaccination campaigns.
			Describe End game strategy by WHO for Polio eradication
ID-CM-004		Measles, Mumps, Rubella	Discuss the global distribution of measles, mumps, Rubella and their occurrence in different population groups
			Describe the mode of transmission (airborne droplets) and the highly contagious nature of measles, mumps, Rubella
			Recognize the role of vaccination coverage and herd immunity in controlling outbreaks of measles, mumps, Rubella
			Discuss public health strategies for prevention and control of measles, mumps, Rubella including vaccination campaigns, surveillance, and outbreak response.
ID-CM-005		EPI	**1.** Describe the goals and objectives of the Expanded Program of Immunization in Pakistan. **2.** Identify the key vaccines included in the EPI schedule.
			Analyze 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
			Discuss enhance vaccination uptake.
			Discuss recent developments in the EPI, Pakistan
			Analyze the potential impact of global health initiatives on the EPI's progress.
ID-CM-006		Diphtheria	Describe the role of vaccination in preventing diphtheria, including the DTP (Diphtheria, Tetanus, Pertussis)
			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.
ID-CM-007		Tetanus	Identify the global distribution of tetanus, including endemic areas & populations at higher risk
			Describe the role of tetanus vaccination (Td or Tdap) in children.
			Describe the role of tetanus vaccination in adults.
			Discuss the significance of booster doses
			Discuss the importance of timely immunization after potential exposure to contaminated wounds.
			Discuss the importance of educating the community about wound care.
			Discuss the significance of seeking medical attention for injuries.

INTERNAL MEDICINE

Code	Topic	Sub Topic	Learning Objectives
ID-Pa-009	**Integrate with Microbiology/ Pathology**	Pyrexia of unknown origin	Define pyrexia of unknown origin.
			Describe the investigations of a patient with pyrexia of unknown origin.
ID-Ph-009	**Integrate with Pharmacology**		Summarize the treatment plan of a patient with pyrexia of unknown origin.
ID-Pa-013	**Integrate with Microbiology**	CNS	Discuss the signs, symptoms, diagnosis and treatment of septic and aseptic meningitis.
			Discuss the signs, symptoms, diagnosis and treatment of septic and aseptic encephalitis.
ID-Ph-010	**Integrate with Pharmacology**	GIT infections	Discuss the signs symptoms diagnosis and treatment of diarrhea and dysentery.
ID-Ph-011		Respiratory tract infections	Discuss the clinical diagnosis and treatment of typical and atypical pneumonia.
			Discuss the clinical diagnosis and treatment of TB

GYNAECOLOGY

Code	Topic	Sub Topic	Learning Objectives
ID-GO-001	**Integrate with Pharmacology**	Sexually transmitted infections	Discuss clinical presentation & treatment of pelvic inflammatory diseases (PID)
ID-GO-002	**Integrate with Microbiology**	Genital tract	Discuss the differential diagnosis of bacterial, parasitic and fungal vaginosis/vaginitis and their treatment

PEDIATRICS MEDICINE

Code	Topic	Sub Topic	Learning Objectives
ID-Pe-001	**Integrate with Microbiology**	CNS	Discuss the signs symptoms diagnosis and treatment of neonatal meningitis.
ID-Pe-002		GIT	Discuss the signs symptoms diagnosis and treatment of diarrhea in infants.
ID-Pe-003		RTI	Discuss the clinical diagnosis and treatment of childhood respiratory tract infections.

SURGERY

Code	Topic	Sub Topic	Learning Objectives
ID-S- 001	**Integrate with Microbiology**	Skin infections	Discuss the treatment of carbuncle, necrotizing fasciitis and gas gangrene
ID-S- 002	**Integrate with Medicine**	GIT	Discuss the signs symptoms diagnosis and surgical treatment of hydatid cyst and its differential diagnosis with amoebic liver abscess

MICROBIOLOGY (INFECTION CONTROL)

Code	Topic	Sub Topic	Learning Objectives
ID-Pa-009	**Microbiology**	Infection prevention & control	Define hospital acquired infections (HAI)
			Discuss various types of HAI
			Enlist bacteria and fungi associated with HAI
			Describe the main routes of transmission of HAI in detail
			Discuss the etiology and prevention of VAP (ventilator associated pneumonia)

			Discuss the etiology and prevention of hospital acquired UTI
			Discuss the etiology and prevention of nosocomial diarrhea
			Discuss the etiology and prevention of central line associated infections
			Discuss various methods of hospital sanitation
			Define antimicrobial surfaces and enlist the microorganisms that are frequently present on touch surfaces
			Describe the various preventive techniques to reduce the HAI

MICROBIOLOGY (BIOSAFETY)

Code	Topic	Sub Topic	Learning Objectives
ID-Pa-010	**Microbiology**	Bio-risk management (BRM	**1.** Define biosafety and biosafety levels according to WHO? **2.** Enlist the bio risk organisms in each of biosafety levels? **3.** What are 4 levels of biosafety? 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? Define biological waste? **4.** Categorize the biological wastes (HAZARDOUS, NON HAZARDOUS, SHARPS)? **5.** Describe procedures for segregation, storage, treatment and disposal of

			biological waste? **6.** Define spill management and discuss the steps for the management of a laboratory spill? **7.** Define PPE and discuss the situations under which PPE should be used by the health care professionals. Discuss the SOP of transportation of biological samples? **8.** Define and briefly discuss bio risk management?

6.3.2 Practical / Lab Work

MICROBIOLOGY

Code	Topic	Sub Topic	Learning Objectives
ID-Pa-011	**Microbiology**	Staining	Identify the stained slides of gram positive and gram- negative bacteria (staphylococci, streptococci, Neisseria, Strept. pneumonia, E. coli, proteus and acid fast bacilli). (if slides will not be available, photographic slides should be used
ID-Pa-012		Laboratory reporting	Interpret the culture sensitivity reports and antibiogram of gram positive and gram-negative bacteria.
ID-Pa-013		Culture sensitivity	Identify and describe the organisms that grow on the Blood agar, Chocolate agar, nutrient agar, TCBS, MacConkey media, LJ media. CLED, TSI, UREASE, CITRATE. blood culture bottle and anaerobic jar
ID-Pa-		Stool	Identify the ova, cysts and trophozoites

014		examination	of protozoans, helminths, cestodes and schistosomes.
ID-Pa-015		Laboratory tests	Perform and interpret the catalase test, coagulase test and oxidase test.

6.3.3 Clinical Rotations / Community Healthcare

INTERNAL MEDICINE

Code	Topic	Sub Topic	Learning Objectives
ID-M- 001	**Internal medicine**	History taking	Demonstrate an accurate and comprehensive history from patient with fever
ID-M- 002		Physical Examination	Perform a thorough general physical examination of a patient with fever
ID-M- 003		Investigations	Order laboratory and radiological investigations for a patient with fever
ID-M- 004		Results	Interpret the results of investigations of a patient with fever
ID-M- 005		Differential diagnosis	Use information from history, physical examination, and laboratory investigations to identify and formulate a differential diagnosis of the underlying causes of fever
ID-M- 006		Therapeutic plan	Formulate a therapeutic plan by integrating information from history, physical examination, and laboratory data for the management of a patient with fever
ID-M- 007		Management plan	Record and present the complete history, physical examination findings, laboratory data, differential diagnosis, and therapeutic plan in a systematic, concise, and coherent manner, both in

			writing and orally

Musculoskeletal & Locomotion-II

7. Musculoskeletal & Locomotion-II

7.1 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.

7.2 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.

7.3 Learning Objectives

7.3.1 Knowledge

RHEUMATOLOGY

Code	Topic	Sub Topic	Learning Objectives
MS2-Rh- 001	**Rheumatology**	Introduction to Rheumatology	Understand the scope and importance of rheumatology.
			Recognize common musculoskeletal disorders managed in rheumatology.
MS2-Rh- 002	**Rheumatology, Medicine**	Rheumatoid Arthritis (RA)	Describe the pathophysiology of Rheumatoid Arthritis (RA).
			Identify clinical features of Rheumatoid Arthritis (RA).
			Explain diagnostic criteria for Rheumatoid Arthritis (RA).
			Differentiate Rheumatoid Arthritis (RA) from other inflammatory joint diseases.
MS2-Rh- 003	**Rheumatology, Medicine**	Osteoarthritis (OA)	Explain the pathogenesis of Osteoarthritis (OA).
			Identify clinical manifestations of Osteoarthritis (OA).
			Discuss diagnostic methods for Osteoarthritis (OA).
	Rheumatology, Community Med		Explain the community burden of Osteoarthritis (OA).
			Identify risk factors for Osteoarthritis (OA).
MS2-Rh- 004	**Rheumatology, Medicine**	Crystal Arthritis (Gout/Pseudo gout)	Define Crystal Arthritis, including Gout and Pseudo gout.
			Describe the pathophysiology of Gout.
			Describe the pathophysiology of Pseudo gout.
			Identify clinical features of Gout.

	Rheumatology, Community Medicine		Identify clinical features of Pseudo gout.
	Rheumatology, Medicine		Discuss diagnostic tests for Crystal Arthritis.
			Differentiate between Gout and Pseudo gout based on clinical and diagnostic findings.
			Outline management strategies for Gout.
			Outline management strategies for Pseudo gout.
MS2-Rh- 005	**Pathology**	Systemic Inflammatory Vasculitis	Define Systemic Inflammatory Vasculitis.
			Describe the pathophysiologyof Systemic Inflammatory Vasculitis.
			Identify types of Systemic Inflammatory Vasculitis.
	Rheumatology, Medicine		Discuss the community burden of Systemic Inflammatory Vasculitis.
	Pathology		Explain risk factors for Systemic Inflammatory Vasculitis.
			Describe clinical features of Systemic Inflammatory Vasculitis.
			Identify diagnostic tests for Systemic Inflammatory Vasculitis.
	Rheumatology, Medicine		Justify the use of diagnostic investigations in Systemic Inflammatory Vasculitis.
	Medicine		Discuss management strategies for Systemic Inflammatory Vasculitis.
MS2-Rh- 006	**Pathology**	Autoimmune Rheumatic Diseases	Define Autoimmune Rheumatic Diseases (e.g., SLE, Sjogren's, Systemic Sclerosis).

			Describe the pathophysiology of Systemic Lupus Erythematosus (SLE).
			Identify clinical manifestations of Sjogren's Syndrome.
			Explain the pathophysiology of Systemic Sclerosis.
	Rheumatology, Medicine		Discuss treatment options for Polymyositis and Dermatomyositis.
			Define Spondylarthritis and its clinical features.
			Describe clinical features of Spondylarthritis.
	Pathology		Explain diagnostic criteria for Autoimmune Rheumatic Diseases.
			Differentiate Autoimmune Rheumatic Diseases from each other.
MS2-Rh- 007	**Rheumatology, Evidence-Based Medicine**	Integrated EBM	Understand the role of evidence-based medicine in rheumatology management.
			Apply evidence-based guidelines to rheumatology case studies.
			Critically evaluate current research in rheumatology.
			Integrate evidence-based practices into rheumatology treatment plans.
			Demonstrate the ability to appraise rheumatology research studies.
			Apply evidence-based findings to clinical decision-making in rheumatology.
			Summarize key research advancements in rheumatology.
			Implement evidence-based guidelines in rheumatology practice.

ORTHOPEDICS

Code	Topic	Sub Topic	Learning Objectives
MS2-Orth- 001	**Orthopedics**	Introduction to Orthopedics	Define the field of orthopedics and its significance.
	Community Medicine		Identify common orthopedic conditions and their impact.
MS2-Orth- 002	**Orthopedics, Radiology**	Fracture Classification and Healing	Explain the classification of fractures using the AO system.
			Describe principles of fracture healing.
			Differentiate between complete and incomplete fractures.
MS2-Orth- 003	**Orthopedics, Pediatrics, Rehabilitation**	Pediatric Fractures	Discuss pediatric fractures and their management.
			Explain Salter-Harris classification for growth plate injuries.
MS2-Orth- 004	**Orthopedics, Geriatrics, Endocrinology**	Osteoporotic Fractures	Define osteoporotic fractures and their clinical features.
			Identify common sites of osteoporotic fractures.
			Discuss risk factors for osteoporosis.
MS2-Orth- 005	**Orthopedics, Oncology, Radiology**	Pathological Fractures	Define pathological fractures and differentiate from traumatic.
			Identify causes of pathological fractures.
			Describe diagnostic approaches for pathological fractures.
			Explain management options for pathological fractures.
MS2-Orth- 006	**Orthopedics, Sports Medicine, Physical**	Sports Injuries	Classify sports injuries and their management.
			Describe common sports injuries in upper and lower limbs.

	Therapy		
	Pathology, Sports Medicine		Discuss pathophysiology of muscle strains and ligament sprains.
	Biomechanics, Orthopedics, Sports Medicine		Explain biomechanics of gait and malalignment injuries.
	Physiology, Sports Medicine		Outline injury prevention strategies in sports.
			Analyze rehabilitation processes for sports injuries.
	Orthopedics, Physical Therapy		Discuss use of assistive devices in rehabilitation.
	Psychology, Sports Medicine		Explain psychological impact of sports injuries.
	Nutrition, Sports Medicine		Describe nutritional roles in recovery from sports injuries.
	Surgery, Orthopedics, Physical Therapy		Understand surgical intervention in severe sports injuries.
	Sports Medicine, Team Management		Promote multidisciplinary approach in managing sports injuries.
MS2-Orth- 007	**Marfan's Syndrome**	Genetic Conditions in Orthopedics	Define genetic conditions: Achondroplasia and Marfan's Syndrome.
			Describe clinical features of

			Achondroplasia.
			Explain management of Marfan's Syndrome.
MS2-Orth- 008	**Orthopedics, Rehabilitation**	Bone and Joint Disorders	Define scoliosis and its types.
	Orthopedics, Pediatrics		Identify clinical features and screening methods for scoliosis.
	Orthopedics, Rehabilitation		Discuss treatment options for scoliosis.
			Recognize multidisciplinary approach in managing scoliosis.
	Orthopedics, Genetics, Rehabilitation		Define Osteogenesis Imperfecta and its genetic basis.
	Orthopedics, Pediatrics		Identify clinical features and types of Osteogeneses Imperfecta.
	Orthopedics, Rehabilitation		Discuss management strategies for Osteogenesis Imperfecta.
	Orthopedics, Rehabilitation		Educate patients on Osteogenesis Imperfecta.
	Orthopedics, Genetics, Surgery		Define Marfan's Syndrome and its genetic basis.
	Orthopedics, Cardiology		Identify clinical manifestations of Marfan's Syndrome.
	Orthopedics, Surgery		Discuss management strategies for Marfan's Syndrome.
	Orthopedics, Rehabilitation		Promote patient education and support for Marfan's Syndrome.

SURGICAL TRAUMATOLOGY

Code	Topic	Sub Topic	Learning Objectives
MS2-	**Trauma**	Introduction to	Define ATLS and describe its

Orth- 009	**Surgery, Surgery, Orthopedics**	Surgical Traumatology	relevance in trauma management.
MS2- Orth- 010	**Trauma Surgery, Emergency Medicine**	Introduction to Trauma Management & ATLS	Explain principles of trauma management and primary survey.
	General Surgery		Describe types of injuries managed in traumatology.
	Trauma Surgery, Surgery, Orthopedics		Discuss multidisciplinary approach in trauma care.
	Trauma Surgery, Surgery, Orthopedics		Identify key specialties in managing traumatic injuries.
MS2- Orth- 011	**Emergency Medicine, Trauma Surgery**	Primary Survey and ATLS	Understand ATLS guidelines in primary survey (ABCDE).
	Emergency Medicine, Trauma Surgery		Recognize common causes of severe trauma.
	Emergency Medicine, Trauma Surgery		Apply ATLS principles in conducting primary survey.
	Radiology, Emergency Medicine		Identify indications for rapid imaging in trauma assessment.
MS2-	**Trauma**	Shock	Describe shock recognition and

Orth- 012	**Surgery, Critical Care**	Recognition and Management	resuscitation measures.
MS2- Orth- 013	**Neurology, Neurosurgery**	Traumatic Brain Injury (TBI)	Define Traumatic Brain Injury (TBI) and classify its severity.
	Neurosurgery, Pathology		Describe pathophysiology of primary and secondary brain injury.
	Epidemiology, Emergency Medicine		Identify common causes of TBI.
	Neurology, Emergency Medicine		Describe clinical features of TBI.
	Radiology, Neurology		Explain importance of early imaging for TBI diagnosis.
	Emergency Medicine, Trauma Surgery		Discuss ATLS role in TBI management.
	Neurology, Neurosurgery, Critical Care		Outline complications of TBI.
MS2- Orth- 014	**Orthopedics, Neurosurgery, Trauma Surgery**	Neck and Spine Trauma	Define Neck and Spine Trauma and classify it.
	Epidemiology, Emergency Medicine		Recognize mechanisms of neck and spine trauma.
	Anatomy, Orthopedics, Neurosurgery		Describe anatomy of spine and spinal cord in trauma context.
	Neurology, Emergency		Identify clinical features of neck and spine trauma.

	Medicine, Neurosurgery		
	Emergency Medicine, Orthopedics		Understand importance of immobilization in spinal trauma.
	Radiology, Orthopedics, Neurosurgery		Discuss role of imaging in spinal trauma diagnosis.
	Emergency Medicine, Trauma Surgery		Recognize role of ATLS in spinal trauma management.
	Critical Care, Neurology, Rehabilitation		Outline complications of spine trauma.
MS2-Orth- 015	**Oral & Maxillofacial Surgery, Plastic Surgery**	Maxillofacial Trauma	Define Maxillofacial Trauma and its classification.
	Epidemiology, Emergency Medicine		Identify causes of Maxillofacial Trauma.
	Plastic Surgery, ENT		Explain anatomy relevant to Maxillofacial Trauma.
	Surgery, Maxillofacial Surgery, ENT		Recognize clinical features of facial trauma.
	Emergency Medicine		Identify importance of airway management in facial trauma.
	Radiology, Oral & Maxillofacial Surgery		Describe radiological investigations for facial fractures.

	Emergency Medicine, Plastic Surgery, ENT		Discuss complications of maxillofacial trauma.
	Emergency Medicine, Trauma Surgery		Outline ATLS principles in maxillofacial trauma management.
	Oral & Maxillofacial Surgery, Plastic Surgery		Discuss surgical interventions for maxillofacial trauma.
MS2-Orth- 016	**Orthopedics, Emergency Medicine**	Extremity Trauma	Define Extremity Trauma and its types.
	Epidemiology, Trauma Surgery		Explain mechanisms of extremity trauma.
	Orthopedics, Emergency Medicine		Recognize clinical signs of extremity injuries.
	Orthopedics, Emergency Medicine		Identify life-threatening complications of extremity trauma.
	Radiology, Orthopedics		Understand role of imaging in extremity trauma diagnosis.
	Emergency Medicine		Describe principles of ATLS in extremity trauma management.
	Orthopedics, Physical Therapy		Discuss management techniques for extremity trauma.
	Orthopedics, Trauma		Explain indications for surgical intervention in extremity trauma.

	Surgery		

PATHOLOGY, PHARMACOLOGY, COMMUNITY MEDICINE and BEHAVIORAL SCIENCES & EBM

Code	Topic	Sub Topic	Learning Objectives
MS2-Pa-001	**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/Pseudo gout
			Discuss the etiology, pathophysiology, morphology, clinical manifestations and diagnostic criteria of Autoimmune Rheumatic Diseases
			Identify bone tumors, cartilaginous and soft tumors and their clinical features.
			Discuss the etiology, pathophysiology, morphology, clinical manifestations and diagnostic criteria of Bone tumours, cartilaginous and soft tumors
MS2-Ph-001	**Pharmacology**	MSK Drugs & Interventions	Describe pharmacologic interventions for MSK disorders.
			Explain mechanisms of NSAIDs in MSK disorders.
			Describe DMARDs and their use in

			MSK disorders.
			Discuss corticosteroids in MSK management.
			Explain bisphosphonates and opioids in MSK disorders.
MS2-CM-001	**Community Medicine**	Epidemiology & Prevention	Understand epidemiology of MSK diseases.
			Discuss public health burden of MSK diseases.
			Explain preventive measures for MSK diseases.
	Pharmacology, Rheumatology	Pharmacologic Management in Rheumatology	Discuss pharmacologic management in rheumatology.
			Understand the use of NSAIDs in rheumatic diseases.
			Describe DMARDs and their role in managing RA.
			Explain corticosteroids in rheumatic disease management.
			Discuss biologics in rheumatology management.
			Describe opioids for pain management in rheumatology.
	Community Medicine	Epidemiology & Prevention	Understand the epidemiology of rheumatic diseases.
			Discuss the public health burden of rheumatic diseases.
			Explain preventive measures for rheumatic diseases.
MS2-BhS- 001	**Behavioral Sciences**	Psychosocial Impact & Patient Counseling	Analyze psychosocial impact of chronic MSK conditions.
			Describe patient counseling techniques for MSK conditions.

			Promote adherence to MSK treatment plans.
			Educate patients on importance of adherence to MSK management.
			Discuss impact of disability on MSK patients.
MS2-Orth- 017	**Rheumatology, Pharmacology**	Integrated EBM	Understand role of evidence-based medicine in MSK management.
	Rheumatology, Evidence-Based Medicine		Apply evidence-based guidelines to rheumatology case studies.
	Rheumatology, Evidence-Based Medicine		Critically evaluate current research in rheumatology.
	Rheumatology, Evidence-Based Medicine		Integrate evidence-based practices into rheumatology treatment plans.
			Demonstrate the ability to appraise rheumatology research studies.
			Apply evidence-based findings to clinical decision- making in rheumatology.
			Summarize key research advancements in rheumatology.
			Implement evidence-based guidelines in rheumatology practice.

7.3.2 Practical / Lab Work

PATHOLOGY, PHARMACOLOGY, COMMUNITY MEDICINE and BEHAVIORAL SCIENCES & EBM

Code	Topic	Sub Topic	Learning Objectives
MS2-Pa-002	**Pathology**	Test Interpretation	Interpret various investigations related to joint diseases including:

			1. Complete Blood Count (CBC) 2. Erythrocyte Sedimentation rate (ESR) 3. C-reactive protein (CRP) 4. Creatine Kinase (CK) 5. Rheumatoid factor (RF) 6. Antinuclear antibody (ANA) 7. Anti-Neutrophil Cytoplasmic Antibodies (ANCA) 8. Serum uric acid level
MS2-Pa-003	**Microbiology, Pathology**	Test Interpretation	Interpret related cultures for diagnosis for infections
MS2-Ra-001	**Radiology Rheumatology Orthopedics Surgical Traumatology**	Test Interpretation	Interpret imaging tests to evaluate various musculoskeletal disorders including: 1. X-rays 2. Computed tomography (CT) Scans 3. Ultrasound Scans 4. Bone Scans
MS2-Ph-002	**Pharmacology**	MSK & locomotion	Analysis and interpretation of Drugs (atracurium or skeletal muscle relaxant) on animal through online videos / simulations / graphs / practical performance. Analysis and interpretation of different Concentrations of Drugs (atracurium or skeletal muscle relaxant) on Frog's rectus muscle through online videos / simulations / graphs / practical performance.

7.3.3 Clinical Rotations / Community Healthcare

GENERAL MEDICINE/GENERAL SURGERY

Code	Topic	Sub Topic	Learning Objectives
MS2-M-001	**General Medicine**	History taking in pain	Elicit symptom of "pain" in history in terms of location, intensity, duration, character, aggravating and relieving factors.
MS2-S-001	**General Surgery**	History taking in swelling	Elicit symptom of "swelling" in history in terms of location, intensity, duration, character, aggravating and relieving factors.
MS2-M-002	**General Medicine**	History taking in swelling in drug history	Elicit symptom of "swelling" in history in terms of location, duration, pattern and any family or drug history.
MS2-Rh-011	**Rheumatology**	History taking in joint mobility	Elicit symptom of 'joint mobility" in history in terms of location, intensity, duration, character, aggravating and relieving factors.
MS2-Orth- 017	**Orthopedics**	History taking in joint mobility	Elicit symptom of "joint mobility" in history in terms of its location, duration, pattern, mechanism of injury with associated symptoms.
			Elicit the signs and symptoms of patient with joint dislocation in history
			Elicit signs and symptoms of patient with fracture in history
MS2-Rh-012	**Rheumatology**	History taking in osteoporosis	Elicit the signs and symptoms of patient with osteoporosis
			Elicit a patient history to make a provisional diagnosis

RHEUMATOLOGY

Code	Topic	Sub Topic	Learning Objectives
MS2-Rh-	**Rheumatology,**	Physical	Palpate joints or areas for tenderness,

013	**Medicine**	Examination	warmth, swelling, and other inflammatory markers (e.g., effusion).
	Rheumatology, Orthopedics		Assess range of motion (ROM) in joints, both actively (patient's effort) and passively (examiner's effort).
	Rheumatology, Medicine		Test for specific joint tenderness and swelling in conditions like gout, rheumatoid arthritis, and osteoarthritis.
	Rheumatology, Orthopedics		Assess for joint deformities (e.g., rheumatoid nodules, Heberden's nodes).
	Rheumatology, Orthopedics		Perform a thorough hand and wrist examination for signs of arthritis (e.g., Boutonnière deformity, swan neck deformity).
	Rheumatology, Orthopedics		Examine for abnormal postural patterns such as scoliosis, kyphosis, or lordosis.
	Rheumatology, Orthopedics		Perform a spine examination, assessing for alignment, tenderness, and range of motion.
	Rheumatology		Perform pulse examination in Systemic Inflammatory Vasculitis.

AFFECTIVE DOMAIN

Code	Topic	Sub Topic	Learning Objectives
MS2-PS-001	**Patient Communication, Ethics**	Affective Domain	Show empathy toward patients with chronic pain.
			Communicate the importance of early intervention.
	Patient Education, Chronic Care		Encourage adherence to long-term treatment plans.
	Patient		Promote timely referrals to specialists

	Education, Chronic Care		when necessary.
	Nutrition, Patient Education		Promote dietary interventions to improve overall health.
	Clinical Decision Making, Pediatrics		Discuss the prognosis of diseases based on findings and individual circumstances.

ORTHOPEDICS

Code	Topic	Sub Topic	Learning Objectives
MS2-Orth- 018	**Orthopedics, Medicine**	Physical Examination	Inspect normal gait and assess deviations such as limping, stiffness, or imbalance.
	Orthopedics, Physical Therapy		Assess muscle strength surrounding normally functioning limbs using standard grading techniques (e.g., Oxford scale).
			Assess joint stability through special tests (e.g., Lachman test for ACL integrity, McMurray test for meniscus tears).
	Orthopedics, Traumatology		Perform a compartment syndrome assessment (Checking for swelling, pain, and vascular compromise).
			Assess vascular status (pulses, capillary refill) in cases of trauma or orthopedic injury.
	Orthopedics, Neurology		Conduct a neurological examination of the upper and lower limbs to assess motor and sensory function.
MS2-	**Clinical Skills,**	Soft Tissue,	Demonstrate skills in performing a

Orth- 019	**Orthopedics**	Neurological, and Bony Extremity Injuries	thorough assessment of extremity injuries, including physical examination techniques.
	Orthopedics, Emergency Medicine		Provide first aid to a person with bone injury like common sprains, fractures and dislocations (immobilization of body part) resuscitation of injured patient.
MS2- Orth- 020	**Clinical Skills, Radiology**	Fractures	Demonstrate skills in assessing fractures through physical examination and appropriate imaging modalities, including X-rays and CT scans.
	Orthopedics, Traumatology		Perform a fracture assessment and evaluate signs of potential fractures or dislocations (e.g., deformity, abnormal movement).
	Orthopedics, Patient Care		Demonstrate skills in developing individualized treatment plans based on fracture type, patient factors, and healing principles.
	Orthopedics, Radiology		Demonstrate clinical skills in assessing and managing fractures in various locations, including the use of appropriate imaging studies.
	Orthopedics, Radiology		Observe application of dressings, splints, plasters and other immobilization techniques in fracture patients in emergency
	Orthopedics, Radiology		Observation of fracture reduction and fixation
	Orthopedics, Radiology		Observation of internal and external fixation
MS2-	**Orthopedics,**	Principles of	Assess and prioritize patients based on

Orth- 021	**Emergency Medicine**	Triage Surgery and Damage Control	the severity of injuries.
	Orthopedics, Trauma Surgery		Implement damage control surgery techniques for orthopedic trauma.
			Identify candidates for damage control surgery.
			Stabilize fractures and manage soft tissue injuries in a timely manner.
			Minimize the risk of complications and improve patient outcomes through damage control strategies.

AFFECTIVE DOMAIN

Code	Topic	Sub Topic	Learning Objectives
MS2- Orth- 022	**Orthopedics, Rehabilitation**	Fractures	Recognize the indications for surgical intervention in the management of fractures, including fixation techniques and considerations for rehabilitation.
MS2- Orth- 023	**Orthopedics, Patient Education**	Fracture Healing and Principles of Treatment	Educate patients on the principles of fracture healing and the importance of adherence to treatment protocols for optimal recovery.
MS2- Orth- 024	**Orthopedics, Patient Education**	Treatment by fracture location and region	Educate patients on the importance of follow-up and rehabilitation based on fracture location to optimize healing and functional recovery.
	Orthopedics, Geriatrics, Rehabilitation		Collaborate with multidisciplinary teams to address unique challenges presented by fractures in specific regions (e.g., elderly patients with hip fractures).
MS2-	**Orthopedics,**	Principles of	Coordinate with other specialties for

Orth- 025	**Emergency Medicine, Anesthesiology**	Triage Surgery and Damage Control	comprehensive trauma care.
	Orthopedics, Rehabilitation		Educate patients and families about the triage process and damage control strategies.

SURGICAL TRAUMATOLOGY

GENERAL PRINCIPLES OF ATLS - ABCDE

Code	Topic	Sub Topic	Learning Objectives
MS2-S-001	**Surgery, Anesthesiology**	General Principles of ATLS - ABCDE	Assess airway patency and clear airway obstructions. Apply cervical spine immobilization if necessary.
	Surgery		Inspect for chest movement, auscultate breath sounds, palpate for deformities.
	Surgery, Cardiology		Assess pulse, control external bleeding, and assess perfusion. Initiate shock management if required.
	Surgery, Neurology		Assess level of consciousness using the Glasgow Coma Scale (GCS) and check pupil reaction.
	Surgery, Emergency Medicine		Expose the patient to assess for hidden injuries and prevent hypothermia.
	Surgery, Emergency Medicine		Conduct secondary survey - a head-to-toe examination, including history and detailed physical exam.

SPECIAL EXAMINATIONS ACCORDING TO TYPE OF TRAUMA

Code	Topic	Sub Topic	Learning Objectives
MS2-M-	**Neurology**	Traumatic	Use the Glasgow Coma Scale to assess

001		Brain Injury (TBI)	consciousness in patients with head injuries.
MS2-Orth- 026	**Orthopedics**	Neck and Spine Trauma	Assess for tenderness and deformity along the cervical spine in trauma patients.
MS2-M-002	**Pulmonology**	Thoracic Trauma	Identify abnormal breath sounds during auscultation to detect potential injuries.
MS2-S-002	**Surgery**	Abdominal Trauma	Perform abdominal palpation to identify tenderness or rigidity indicating injury.
MS2-S-003	**Surgery**	Maxillofacial Trauma	Recognize signs of facial fractures or deformities during the examination.
MS2-S-004	**Orthopedics**	Extremity Trauma	Conduct a quick neurovascular examination of the limbs to evaluate pulse and sensation.
MS2-S-005	**General Surgery**	Disaster Surgery	Conduct a triage to prioritize patients in mass casualty situations.

AFFECTIVE

Code	Topic	Sub Topic	Learning Objectives
MS2-S-009	**Trauma Surgery, Emergency Medicine**	Early Assessment and Management of Severe Traum	Recognize when to initiate life-saving interventions such as airway management, chest decompression, and external hemorrhage control.
	Emergency Medicine, Trauma Surgery		Initiate consultation/ referral to a trauma center for further management, ensuring early communication with the trauma team.
	Trauma Surgery, Emergency Medicine		Recognize when to initiate life-saving interventions such as airway management, chest decompression,

			and external hemorrhage control.

Forensic Medicine & Toxicology-II

8. Forensic Medicine & Toxicology-II

8.1 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.

8.2 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.

8.3 Learning Objectives

8.3.1 Knowledge

TRAUMATOLOGY

Code	Topic	Sub Topic	Learning Objectives
For2-Tr-001	**Forensic Medicine**	General concept	Define injury, wound and hurt.
			Classify injuries on the basis of causative weapons
			Classify injuries as per Qisas and Diyyat Act.
For2-Tr-002		Wound production	Explain mechanism ofwound production with reference to subject, object and contact.
For2-Tr-003		Abrasion	**1.** Define abrasions. Classify abrasion. **2.** Describe mechanism of production of abrasions. Differentiate between different types of abrasions. **3.** Explain medico legal importance of abrasions.
For2-Tr-004		Bruise	**1.** Define bruises. **2.** Describe mechanism of production of bruises. Classify bruises. **3.** 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. **4.** Explain medico legal importance of bruises.
For2-Tr-005		Laceration	**1.** Define lacerated wound. **2.** Outline mechanism of production of a lacerated wound. **3.** Classify lacerated wounds.

			4. Differentiate between a lacerated wound and incised wound on gross examination. **5.** Explain medico legal importance.
For2-Tr-006	**Surgery/Orthopedics**	Fractures	**1.** Explain mechanism of fracture of bones/tooth. Discuss the mechanism of fractures/tooth. **2.** Describe different types of fractures of bones.
			1. Interpret the age of fractures from radiological findings. Illustrate stages of healing of fractures of bones/teeth. Apply the nature of the fracture in the injury certificate as per Qisas and Diyat act. **2.** Explain medico-legal importance of fracture of bone/tooth.
For2-Tr-007		Incised/stab wounds	**1.** Define incised/stab wounds. **2.** Discuss mechanism of production of an incised wound. Explain medico-legal significance of incised/stab wounds

SPECIAL TRAUMATOLOGY

Code	Topic	Sub Topic	Learning Objectives
For2-Tr-008	**Pathology**	Pathophysiology of injuries	Describe the pathophysiology of injuries. Explain effects of injuries on the body.
For2-Tr-009	**Pathology, surgery, medicine & Forensic**	Timing of injury / ante mortem, post mortem nature of wound	**1.** Elaborate different methods (naked eye examination, microscopic examination, histochemical and biochemical methods) for

	medicine		determination of age of wound. **2.** Describe different methods (naked eye examination, microscopic examination, histochemical and biochemical methods of determination of ante mortem/ post mortem nature (vital reaction) of a wound.
For2-Tr-010		Ewing's postulates	Link Sequelae of trauma to its original cause and search for the relationship of sequelae to pre-existing disease.
For2-Tr-011		Battered baby syndrome	**1.** Give a detailed account of battered baby or Caffey syndrome from a medico legal point of view. **2.** Diagnose a case of a battered baby on the basis of different injuries sustained by a battered baby
For2-Tr-012		Torture	**1.** Define torture. **2.** Explain reasons, types and complications of torture. Describe medico legal aspects of torture.
For2-Tr-013		Medico legal Certification of injury	Examine and prepare Medico-legal report of an injured person with different etiologies in a simulated/supervised environment.
For2-Tr-014		Internal ballistics	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
For2-Tr-015		External Ballistics	To explain the factors affecting the trajectory of bullet after its exit from

			the muzzle end.
For2-Tr-016		Terminal Ballistics	**1.** Interpret wound complex produced by a rifled and non- rifled weapons at different ranges. **2.** Calculate the distance of fire from the wound examination. **3.** Differentiate between entry and exit wounds of fire arms. **4.** Explain medico legal importance of fire arm injuries.
For2-Tr-017		Gun powders	Identify gun powders and ammunition used through different methods.
For2-Tr-018		Blast injuries	**1.** Describe mechanics of blast injuries. **2.** Explain effects of blast injuries on human body. Describe medico legal aspects of blast injuries
For2-Tr-019		Regional Injuries	**1.** Explain mechanism of injuries to soft and bony tissues of head, neck, chest, abdomen and limbs. **2.** Describe effects of injuries to head, neck, chest, abdomen and limbs. **3.** Describe medico legal aspects of regional injuries
For2-Tr-020		Transportation Injuries	**1.** Classify transport accidents. **2.** Describe different factors involved in the causation of RTA. **3.** Classify and describe different patterns of injuries sustained by pedestrians and occupants of the vehicles **4.** Explain medico legal significance and prevention of RTA.

For2-Tr-021	**Surgery**	Thermal Injuries / Burn	**1.** Classify electrical injuries injuries- low voltage and high voltage **2.** Explain factors affecting electrocution. **3.** Describe mechanism and causes of death in electrocution. **4.** Interpret different patterns of electrical injuries due to low and high voltage current and lightening **5.** Describe autopsy findings and medico legal importance of electrocution
For2-Tr-022		Electrocution Lightening	**1.** Explain deaths from exposure to high environmental temperature like heat stroke, heat cramps and heat exhaustion. **2.** Explain deaths from exposure to low environmental temperature like Frost bite, Trench foot, Immersion foot. **3.** Describe their mechanism of development, autopsy findings and medico legal importance. **4.** Interpret Starvation, causes, clinical findings, autopsy findings and medico legal importance
For2-Tr-023		Hyper / Hypothermia/ Starvation	**1.** Describe chemical burns **2.** Explain mechanism of development of chemical burns Describe autopsy findings
For2-Tr-024		Chemical Burns	**1.** Classify electrical injuries injuries- low voltage and high voltage **2.** Explain factors affecting

			electrocution. **3.** Describe mechanism and causes of death in electrocution. **4.** Interpret different patterns of electrical injuries due to low and high voltage current and lightening **5.** Describe autopsy findings and medico legal importance of electrocution **6.** Summarize the chemical buns as per qisas and diyat act. **7.** Describe medico legal importance of chemical burns.
For2-Tr-025		Drowning	**1.** Define and classify drowning. **2.** Explain mechanism of death in wet and dry drowning. Describe external and internal autopsy findings in wet and dry drowning. **3.** Interpret biochemical and diatom tests. **4.** Emphasize medico legal importance of drowning

MEDICOLEGAL ASPECTS OF SEXUAL OFFENCES

Code	Topic	Sub Topic	Learning Objectives
For2- Se-001	**Forensic Medicine & Gyne/obs**	Impotency frigidity and sterility	**1.** Comprehend the terms-impotency, frigidity in females and sterility **2.** Explain their causes. **3.** Narrate their medico legal importance
For2- Se-002		Virginity and defloration	**1.** Explain signs of virginity and defloration.

			2. Interpret medico legal importance
For2- Se-003		Pregnancy	Describe presumptive, probable and sure signs of pregnancy in living and dead.
For2- Se-004		Delivery	Explain recent and old signs of delivery in living and dead.
For2- Se-005		Abortion/Miscarriage	**1.** Explain motives for criminal abortions **2.** Reproduce different methods of inducing criminal abortion **3.** Outline complications and causes of death due to abortion. **4.** Describe findings in living and dead after abortion. Examine the aborted material to assess the age and viability **5.** Apply sections of Qisas and Diyat act relevant to abortion.
For2- Se-006		Sexual Offences	**1.** Classify sexual offenses (natural, un-natural and perversions) and explain their medico legal importance. **2.** Describe sexual perversions and identify the traits. Reproduce different sections of law relevant to sexual offenses. **3.** Explain Medico-legal examination of a victim of sexual assault and issue report. **4.** Describe Medico-legal examination of the alleged accused of rape and **5.** issue report

			6. Know the Medico-legal examination in unnatural sexual offence. **7.** Outline collection, preservation and dispatch of specimens in cases of sexual assaults to chemical examiner. **8.** Interpret Psycho-pathology of assailant Interpret Psycho-pathology of victim **9.** Undertake initial management & referral of victim.
For2- Se-007	**Forensic Medicine**	Infanticide	**1.** Define infanticide. **2.** State 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

8.3.2 Practical / Lab Work

TRAUMATOLOGY

Code	Topic	Sub Topic	Learning Objectives
For2-Tr-026	**Forensic medicine**	Mechanical injuries	Recognize and identify common conventional blunt objects, sharp objects, firearms, electrical instruments and chemicals and their medico- legal aspects. (lathi, knife, axe, gandasa, sickle, dagger, razor & stick, fire arms
For2-Tr-027		Abrasion	Differentiate between different types of abrasions
For2-Tr-		Bruise	Assess the age of a bruise on the basis

028			of color changes. Differentiate between a bruise and post mortem staining
For2-Tr-029		wound	Differentiate between a lacerated and incised wound on naked eye examination
For2-Tr-030		Age of fracture	Assess the age of fracture by recognition of healing stages on x rays Apply different sections of Qisas and Diyat Act from examination of fractures on x rays
For2-Tr-031		Hurt / Qisas N Diyat Act	Identify hurt and apply relevant section of Qisas and Diyat Act for: **1.** Itlaf-udw **2.** Itlaf -slahiat-udw **3.** Shajja **4.** Jurh
For2-Tr-032		Certification of injury	Demonstrate appropriate examination of an injured person and issue the report in a simulated/supervised environment correctly
For2-Tr-033		Firearm	**1.** Identify different types of fire arm weapons **2.** Identify different parts of fire arm weapons Identify different parts of ammunition.
			1. Determine the type of fire arm weapon from the examination of fire arm wound complex. **2.** Calculate the firing range of the weapon from appearance of wound. **3.** Identify characteristics of entry and

			exit fire arm wounds.
For2-Tr-034		Burn	**1.** Differentiate between dry burn and wet burn. Calculate burnt surface area **2.** Determine age and nature of burn on naked eye examination Recognize autopsy findings.
For2-Tr-035		Electrocuted injury	**1.** Recognize between entry and exit wounds of electric currents on body. **2.** Describe different pathways of electric currents through human body. **3.** Recognize different patterns of electrical injuries.
For2-Tr-036		Hypo / Hypothermia / starvation	**1.** Recognize different patterns of effects of high/low environmental temperature on the body. **2.** Appreciate clinical and autopsy findings of death due to starvation
For2-Tr-037		Chemical Burns	**1.** Recognize different patterns of Chemical burns over body. **2.** Apply relevant sections of Qisas and Diyat Act.
For2-Tr-038		Hanging	**1.** Identify different kinds of ligature materials used for hanging **2.** Recognize different types of hanging **3.** Appreciate nonspecific and specific autopsy findings of hanging. **4.** Know how to remove and preserve the ligature material used.

For2-Tr-039		Strangulation / Hanging	**1.** Differentiate between ligature marks due to hanging and strangulation. **2.** Appreciate nonspecific and specific autopsy findings of hanging. **3.** Know how to remove and preserve the ligature material used.
For2-Tr-040		Throttling	**1.** Appreciate external and internal autopsy findings of death due to throttling. **2.** Determine the position of assailant and victim from external marks on neck
For2-Tr-041		Smothering / Gagging	Appreciate external and internal autopsy findings of death due to smothering, choking, gagging and traumatic asphyxia
For2-Tr-042		Drowning	Appreciate external and internal autopsy findings of death due to drowning.

SEXOLOGY

Code	Topic	Sub Topic	Learning Objectives
For2- Se-008	**Forensic medicine**	Sexual assault	**1.** Replicate Medico-legal examination of a victim of sexual assault and issue report. **2.** Demonstrate Medico-legal examination of the alleged accused of rape and issue report. **3.** Copy the Medico-legal examination in unnatural sexual

			offence. **4.** Perform collection, preservation and dispatch of specimens in cases of sexual assaults to chemical examiner.

9. CFRC for Block-8

Code	Subject	Task/Skill
CFRC3-017	Orthopaedics	Joint injury history
CFRC3-018	Orthopaedics	Fracture history
CFRC3-019	Orthopaedics	Inspection of joints and fractures
CFRC3-020	Orthopaedics	Palpation for tenderness and deformities
CFRC3-021	Orthopaedics	Range of motion examination
CFRC3-056	Surgery	Focused surgical history-taking (neck lump, trauma, abdominal pain etc.)
CFRC3-057	Surgery	Formulate a diagnosis from surgical complaints
CFRC3-060	Surgery	Manage patients pre- and post- operatively
CFRC3-031	Cardiology	Inspection of precordium and JVP
CFRC3-032	Cardiology	Palpation (apex beat, peripheral pulses)
CFRC3-033	Cardiology	Auscultation (heart sounds, murmurs)
CFRC3-030	Cardiology	Palpitations history
CFRC3-028	Cardiology	Chest pain history
CFRC3-029	Cardiology	Dyspnea (shortness of breath) history
CFRC3-034	Cardiology	Rate, rhythm, axis interpretation
CFRC3-035	Cardiology	ST segment changes, T-wave abnormalities
CFRC3-036	Cardiology	Hypertension diagnosis
CFRC3-037	Cardiology	Heart failure diagnosis
CFRC3-038	Cardiology	Ischemic heart disease diagnosis
CFRC3-039	Pulmonology	Cough and sputum production history
CFRC3-051	Medicine	Patient-centered clinical decision-making
CFRC3-052	Medicine	Provide evidence-based management for common primary care conditions
CFRC3-062	Medicine	System-specific examinations 1. GIT 2. Cardiovascular 3. respiratory endocrine
CFRC3-062	Pulmonology	System-specific examinations 1. GIT 2. Cardiovascular 3. respiratory endocrine
CFRC3-062	Cardiology	System-specific examinations 1. GIT 2. Cardiovascular 3. respiratory endocrine

10. PERL's for Block-8

MUSCULOSKELETAL AND LOCOMOTION-II			
Topic	**Sub Topic**	**Learning objectives**	**Proposed Portfolio Entry**
Research	Identification of Research Problem	**1.** Describe the process of identifying a viable research problem based on gaps in existing literature. **2.** Draft a research problem statement in a relevant medical field and formulate a research question based on the current literature. **3.** Submit a well-defined research problem Statement that highlights a gap in the literature and explains the importance of investigating this issue further.	Evidence of submitted Research Problem to assigned Research Mentor.
Professionalism	Adapting to the Physician's Role	**1.** 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,	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.

		critical thinking, communication, and time management)	
Ethics	Autonomy in rehabilitation, Informed consent	**1.** Discuss the process of obtaining informed consent, ensuring patients are fully aware of their treatment options, risks, and potential outcomes. **2.** Ensure the patient's autonomy is respected throughout the decision-making process.	Develop an Informed consent Sheet for patients undergoing rehabilitation after trauma.
Leadership	Entrepreneurship in Healthcare	**1.** Discuss the basic principles of entrepreneurship in healthcare, including identifying gaps in healthcare services, understanding innovation, and exploring how entrepreneurial thinking can improve patient care and healthcare delivery. **2.** 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	Propose an innovative solution that could address the gap or improve patient care, with a focus on how entrepreneurial thinking can be applied.

		approach.	

INFECTIOUS DISEASES			
Topic	**Sub Topic**	**Learning objectives**	**Proposed Portfolio Entry**
Professionalism	Professional Responsibility in Public Health	**1.** 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. **2.** 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.
Ethics	End-of-life decisions, ventilator use	**1.** Explore the ethical considerations involved in end-of-life decisions, including using ventilators, balancing patient autonomy, family wishes, and medical	Write a case analysis on end-of-life decisions, particularly regarding ventilator use, and propose an ethically sound approach to decision-making.

		judgment in making these decisions.	
Research	Developing Research Hypotheses and Questions	**1.** Understand the process of formulating research hypotheses and developing research questions, with a focus on creating clear, testable, and relevant questions using PICO **2.** Formulate a research question and corresponding hypothesis based on a gap identified in the existing literature related to the research problem identified previously. **3.** Submit a research proposal with a problem statement supported by a brief literature review, a well-defined research question and a hypothesis.	Evidence of submitted research hypothesis/question to assigned Research Mentor.
Research	Introducing Clinical Audit	**1.** Understand the basic concept of a clinical audit and how it can help improve healthcare practices, particularly in infection control, by comparing current practices to standards.	Submit a brief reflection on an infection control practice you observed during your clinical rotation. Suggest one area that could be audited to improve the quality of care and

			explain why this area was chosen.

NEOPLASIA			
Topic	**Sub Topic**	**Learning objectives**	**Proposed Portfolio Entry**
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.

4. Teaching & Learning Methodologies

- **Interactive Lectures**

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

- **Small group discussions**

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

- **Practical's**

  Hands-on performance of skills in laboratory

- **Clinical Ward Rotation**

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

- **Case based Learning**

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

- **Self-directed learning**

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

5. Assessment Methodologies

Theory

1. MCQ's

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

2. SEQ's

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

Practical

1. OSPE

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

2. OSCE

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

3. OSVE

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

4. EOR

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

ASSESSMENT POLCIY AND TOS OF UHS

6. Assessment Policy (UHS)

Statutes

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

Third Professional Exam:

   a) Paper 1 will be based on contents of Block 7;
   b) Paper 2 will be based on contents of Block 8;
   c) Paper 3 will be based on contents of Block 9;

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

Written Examination

a) The written component of Papers 7, 8, and 9 will consist of 'One-best- type' Multiple Choice Questions (MCQ) and Structured Essay Questions (SEQ) in a ratio of 65:35 %.

b) Each MCQ will have five options (one best response and four distractors) and will carry one (01) mark.

c) There will be no negative marking.

d) Each SEQ will be a structured question with five (05) marks each.

e) SEQ's will only be based on the major content areas of the year.

f) There will be total of 90 MCQs and 10 SEQs in every written paper in Papers 7, 8, and 9.

g) The duration of each written paper will be 190 minutes (03 hours and 10 minutes).

h) The section 'B' of the MCQs and the section 'B' of the SEQs must be passed independently also to be declared as 'pass' in the theory exam.

i) The MCQ section will be 90 minutes duration and the SEQ section of 100 minutes.

Oral/Practical/Clinical Examination

a) The 'Oral/Practical/Clinical' component of each Papers 7, 8, and 9 will consist of a total of fifteen (15) OSPE/OSCE/OSVE stations in each 'Oral/Practical/Clinical' examination.

b) There will be eleven (11) Observed OSPE/OSCE (Objective Structured Practical Examination Objective Structured Clinical Examination) stations from major subject areas. Each OSPE/OSCE station will have the practical component and an evaluation of the underlying principle relevant to that practical with a component of applied knowledge.

c) There will be one (01) Observed OSCE (Objective Structured Clinical Examination) station, based on PERLs-3 & ExposITory-3 in each 'Oral/Practical/Clinical' examination.

d) There will be three (03) Observed interactive OSVE (Objective Structured Viva Examination) from major subject areas. Each OSVE station will have a structured viva, to assess a practical component along with evaluation of the underlying principle relevant to that practical with a component of applied/practical knowledge and related clinical application.

e) OSPE/OSCE station from the major subject areas will carry eight (08) marks.

f) The OSCE station of PERLs-3 & ExposITory-3 will carry ten (10) marks.

g) Each OSVE station will carry fourteen (14) marks

h) The duration of each "Oral/Practical/Clinical" examination will be 120 minutes (2 hours).

i) Time for each OSPE, OSCE and OSVE station will be eight (08) minutes.

10. Every candidate shall take the examination in the following Blocks (Modules) in the third Professional MBBS Examinations.

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

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

The examination in Block 7 shall be as follows: -

a) One written paper of 140 marks having two parts:

i. Part I shall have ninety Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 90 minutes. There will be no negative marking.

ii. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 110 minutes.

b) "Oral/Practical/Clinical" examination shall have 140 marks in total.

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

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

The examination in Block 8 shall be as follows: -

a) One written paper of 140 marks having two parts:

i. Part I shall have ninety Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 90 minutes. There will be no negative marking.

ii. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 110 minutes.

b) "Oral/Practical/Clinical" examination shall have 140 marks in total.

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

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

The examination in Block 9 shall be as follows: -

a) One written paper of 140 marks having two parts:

i. Part I shall have ninety Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 90 minutes. There will be no negative marking.

ii. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 110 minutes.

b) "Oral/Practical/Clinical" examination shall have 140 marks in total.

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

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

Table 1

<table>
<tr><th colspan="7">YEAR-3</th></tr>
<tr><th>Subject</th><th colspan="2">Theory</th><th colspan="3">Practical</th><th>Total</th></tr>
<tr><td rowspan="4">BLOCK 7

Modules
(Foundation-II + Hematopoietic, Immunity & Implant + General & Clinical Pharmacology + Forensic Medicine & Toxicology-I)</td><td>Part I MCQs (90)</td><td>90 Marks</td><td rowspan="2">Practical /Clinical Examination</td><td rowspan="2">11 OSPE
01 OSCE
03 OSVE</td><td rowspan="2">Marks
88
10
42</td><td rowspan="4">350</td></tr>
<tr><td>Part II SEQS (10)</td><td>50 Marks</td></tr>
<tr><td>Internal Assessment 10%</td><td>35 Marks</td><td>Internal Assessment 10%</td><td colspan="2">35 Marks</td></tr>
<tr><td>Total</td><td>175</td><td>Total</td><td colspan="2">175</td></tr>
<tr><td rowspan="4">BLOCK 8

Modules
(Neoplasia + Infectious Diseases + Musculoskeletal & Locomotion-II + Forensic Medicine & Toxicology-II)</td><td>Part I MCQs (90)</td><td>90 Marks</td><td rowspan="2">Practical /Clinical Examination</td><td rowspan="2">11 OSPE
01 OSCE
03 OSVE</td><td rowspan="2">Marks
88
10
42</td><td rowspan="4">350</td></tr>
<tr><td>Part II SEQS (10)</td><td>50 Marks</td></tr>
<tr><td>Internal Assessment 10%</td><td>35 Marks</td><td>Internal Assessment 10%</td><td colspan="2">35 Marks</td></tr>
<tr><td>Total</td><td>175</td><td>Total</td><td colspan="2">175</td></tr>
<tr><td rowspan="4">BLOCK 9

Modules
(Cardiovascular -II + Respiratory II + Community Medicine & Public Health + Family Medicine I + Forensic Medicine & Toxicology- III)</td><td>Part I MCQs (90)</td><td>90 Marks</td><td rowspan="2">Practical /Clinical Examination</td><td rowspan="2">11 OSPE
01 OSCE
03 OSVE</td><td rowspan="2">Marks
88
10
42</td><td rowspan="4">350</td></tr>
<tr><td>Part II SEQS (10)</td><td>50 Marks</td></tr>
<tr><td>Internal Assessment 10%</td><td>35 Marks</td><td>Internal Assessment 10%</td><td colspan="2">35 Marks</td></tr>
<tr><td>Total</td><td>175</td><td>Total</td><td colspan="2">175</td></tr>
<tr><td colspan="6">Total Marks:</td><td>1050</td></tr>
</table>

12. No grace marks shall be allowed in any examination or practical under any guise or name.

13. At least 50% MCQs & 50% SEQs shall be based on applied/clinical/case scenario to assess high order thinking in the papers set for the students of Third Professional MBBS Examinations.

7. Exam Regulations by UHS

Regulations

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

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

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

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

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

8. Examination Rules AFMDC

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

9. Internal Assessment Policy (UHS)

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

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

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

10. Table of Specification (TOS)

MBBS 3rd Professional							
Block-8							
Subject	Written Exam			Oral/Practical/Clinical Exam			
	MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE /OSCE (8 marks each observed)	OSCE (10 marks each observed)	OSVE (14 marks each observed)	Marks
Pharmacology	12	02	22	03	-	01	38
Pathology	30	05	55	04	-	02	60
Family Medicine	-	-	-	-	-	-	-
Community Medicine	04	-	04	-	-	-	-
Surgery	15	01	20	01	-	-	08
Medicine	15	01	20	01	-	-	08
Forensic	10	01	15	01	-	-	08
Behavioral	02	-	02	-	-	-	-
Patient Safety	02	-	02	-	-	-	-
CFRC	-	-	-	01	-	-	08
PERLs + Expository	-	-	-	-	01	-	10
Total	**90**	**10x5=50**	**140**	**11 stations x 08 = 88**	**01 stations x 10 = 10**	**03 stations x 14=42**	**140**

11. Frame work of Block 8 3rd Year MBBS Timetable 2024-25

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

12. Clinical Ward Rotation of 3rd Year MBBS 2024-25

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

Group A	Group B	Group C
21064, 21066, 21067, 21104	21105, 21139, 21141, 21152	22047 - 22073
22001 - 22023	22024 - 22046	

Group D	Group E	Group F
22074 - 22099	22100 - 22124	
		22125 - 22150

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

Group Wise Rotation 3rd Year MBBS

Rotations	Medicine	Medicine	Group 1 Specialities	Group 1 Specialities	Group 2 Specialities	Group 2 Specialities
Rotations 1	A	B	C	D	E	F
Rotations 2	B	C	D	E	F	A
Rotations 3	C	D	E	F	A	B
Rotations 4	D	E	F	A	B	C
Rotations 5	E	F	A	B	C	D
Rotations 6	F	A	B	C	D	E

Clinical Ward Rotation schedule of BLOCK 8 (3rd Year MBBS) Session 2024-25

Clinical Ward Rotation	Morning	Evening
1st Rotation	23rd June 2025 - 5th July 2025	30th June 2025 - 5th July 2025

2nd Rotation	7th July 2025 - 19th July 2025	14th July 2025 - 19th July 2025
3rd Rotation	21st July 2025 - 2nd August 2025	28th July 2025 - 2nd August 2025
4th Rotation	4th August 2025 - 16th August 2025	11th August 2025 - 16th August 2025
5th Rotation	18th August 2025 - 30th August 2025	25th August 2025 - 30th August 2025
6th Rotation	1st September 2025 - 13th September 2025	8th September 2025 - 13th September 2025

3rd Year MBBS Ward Rotation

Clinical Rotation	Morning	Evening	Total Duration	Credit Hours
Rotation 1 (Medicine)	2 Weeks	1 Weeks	3 Weeks	12+6=18 Hours in each rotation
Rotation 2 (Emergency Medicine)	2 weeks	1 Weeks	3 Weeks	
Rotation 3 (Orthopedics)	2 weeks	1 Weeks	3 Weeks	
Rotation 4 (Pulmonology)	2 weeks	1 Weeks	3 Weeks	
Rotation 2 (Cardiology)	2 weeks	1 Weeks	3 Weeks	
Rotation 4 (Surgery)	2 Weeks	1 Weeks	3 Weeks	

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

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

Department wise Competencies of Block 8

Subjects	CFRC3	Ward rotations
Medicine	**General Medicine**	
	CFRC3-051 Patient-centered clinical decision-making CFRC3-052 Provide evidence-based management for common primary care conditions CFRC3-062 System specific examination GIT, Endocrine	1. Demonstrate an accurate and comprehensive history from patient with fever 2. Perform a thorough general physical examination of a patient with fever 3. Order laboratory and radiological investigations for a patient with fever 4. Interpret the results of investigations of a patient with fever 5. Use information from history, physical examination, and laboratory investigations to identify and formulate a differential diagnosis of the underlying causes of fever 6. Formulate a therapeutic plan by integrating information from history, physical examination, and laboratory data for the management of a patient with fever 7. Record and present the complete history, physical examination findings, laboratory data, differential diagnosis, and therapeutic plan in a systematic, concise, and coherent manner, both in writing and orally
	Rheumatology	
		1. Palpate joints or areas for tenderness, warmth, swelling, and other inflammatory markers (e.g., effusion). 2. Assess range of motion (ROM) in joints, both actively (patient's effort) and passively (examiner's effort).

		3. Test for specific joint tenderness and swelling in conditions like gout, rheumatoid arthritis, and osteoarthritis. 4. Perform pulse examination in Systemic Inflammatory Vasculitis.
Pulmonology	CFRC3-039 Cough and sputum production history CFRC3-062 System specific examination Respiratory	1. Inspect for chest movement, auscultate breath sounds, palpate for deformities.
Emergency Medicine		1. Coma Scale (GCS) and check pupil reaction. 2 Conduct secondary survey - a head-to-toe examination, including history and detailed physical exam. 3. Perform abdominal palpation to identify tenderness or rigidity indicating injury. 4. Conduct a quick neurovascular examination of the limbs to evaluate pulse and sensation. 5. Conduct a triage to prioritize patients in mass casualty situations. 6. Use the Glasgow Coma Scale to assess consciousness in patients with head injuries.
Surgery	(CFRC3-056) Focused surgical history-taking (neck lump, trauma, abdominal pain etc) CFRC3-057 Formulate a diagnose from surgical complaints	. Elicit symptom of “swelling” in history in terms of location, intensity, duration, character, aggravating and relieving factors 2. Elicit symptom of “swelling” in history in terms of location, duration, pattern and any family or drug history. 3. Assess airway patency and clear airway obstructions. 4. Apply cervical spine immobilization if

	(CFRC3-60) Manage patients pre and post operatively	necessary. 5. Assess pulse, control external bleeding, and assess perfusion. Initiate shock management if required 7. Assess level of consciousness using the Glasgow 8. Expose the patient to assess for hidden injuries and prevent hypothermia. 9. Recognize signs of facial fractures or deformities during the examination. 10. Elicit symptom of "pain" in history in terms of location, intensity, duration, character, aggravating and relieving factors 11. Elicit a patient history to make a provisional Diagnosis 12. Perform pulse examination in Systemic Inflammatory Vasculitis. 13. Identify abnormal breath sounds during auscultation to detect potential injuries.
Cardiology	CFRC3-028 Chest pain history CFRC3-029 Dyspnea (shortness of breath) history CFRC3-030Palpitation's history CFRC3-031Inspection of precordium and JVPCFRC3-032Palpation (apex beat, peripheral pulses)	

	CFRC3-033Auscultation (heart sounds, murmurs) CFRC3-034 Rate, rhythm, axisinterpretation CFRC3-035 ST segment changes, T-wave abnormalities CFRC3-036 Hypertension diagnosis CFRC3-037 Heart failure diagnosis CFRC3-038 ischemic heart disease CFRC3-062 System specific examination Cardiovascular	
Orthopaedics	CFRC3-017 Joint injury history CFRC3-018 Fracture history CFRC3-019 Inspection of joints and fractures CFRC3-020 Palpation for tenderness and deformities CFRC3-021 Range of motion	Elicit symptom of 'joint mobility" in history in terms of location, intensity, duration, character, aggravating and relieving factors. 2. Elicit symptom of "joint mobility" in history in terms of its location, duration, pattern, mechanism of injury with associated symptoms 3. Elicit the signs and symptoms of patient with joint dislocation in history 4. Elicit signs and symptoms of patient with fracture in history 5. Elicit the signs and symptoms of patient with Osteoporosis 6. Inspect normal gait and assess deviations such

	examination	as limping, stiffness, or imbalance. 7. Assess muscle strength surrounding normally functioning limbs using standard grading techniques (e.g., Oxford scale). 8. Assess joint stability through special tests (e.g., Lachman test for ACL integrity, McMurray test for meniscus tears). 9. Perform a compartment syndrome assessment (checking for swelling, pain, and vascular compromise). 10. Assess vascular status (pulses, capillary refill) in cases of trauma or orthopaedic injury. 11. Conduct a neurological examination of the upper and lower limbs to assess motor and sensory function. 12. Demonstrate skills in performing a thorough assessment of extremity injuries, including physical examination techniques. 13. Provide first aid to a person with bone injury like common sprains, fractures, and dislocations (immobilization of body part), resuscitation of an injured patient. 14. Demonstrate skills in assessing fractures through physical examination and appropriate imaging modalities, including X-rays and CT scans. 15. Perform a fracture assessment and evaluate signs of potential fractures or dislocations (e.g., deformity, abnormal movement). 16. Demonstrate skills in developing individualized treatment plans based on fracture type, patient factors, and healing principles. 17. Demonstrate clinical skills in assessing and

		managing fractures in various locations, including the use of appropriate imaging studies. 18. Observe application of dressings, splints, plasters, and other immobilization techniques in fracture patients in emergency settings. 19. Observe fracture reduction and fixation procedures. 20. Observe internal and external fixation techniques. 21. Assess and prioritize patients based on the severity of injuries. 22. Implement damage control surgery techniques for orthopaedic trauma. 23. Identify candidates for damage control surgery. 24. Stabilize fractures and manage soft tissue injuries in a timely manner. 25. Minimize the risk of complications and improve patient outcomes through damage control strategies. 14. Assess for joint deformities (e.g., rheumatoid nodules, Heberden's nodes). 15. Perform a thorough hand and wrist examination for signs of arthritis (e.g., Boutonnière deformity, swan neck deformity). 16. Examine for abnormal postural patterns such as scoliosis, kyphosis, or lordosis. 17. Perform a spine examination, assessing for alignment, tenderness, and range of motion. 18. Assess for tenderness and deformity along the cervical spine in trauma patients.

RESOURCE BOOKS

13. Learning Resources

Anatomy	• Snell's Clinical Anatomy 10th ed. • Langman's Medical Embryology 12th ed • Medical Histology by Laiq Hussain Siddiqui 8th edition. • General Anatomy by Laiq Hussain Siddiqui 6th edition.
Biochemistry	• Harpers illustrated Biochemistry (latest edition). Rodwell.V.W MCGrawHill publishers. • Lippincott illustrated Review (latest edition). Kluwer.W. • Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed
Pathology	• Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders. • Robbins and Cotran Pathological Basis of Disease. Kumar, V., Abbas, A. and Aster, J. Latest Edition • Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pocket Companion to Pathologic basis of diseases, Saunder Harcourt. • Walter and Israel. General Pathology. Churchill Livingstone. • Robbins & Kumar, Medical Microbiology and Immunology Levinson.
General Medicine	• Principles and Practice of Medicine by Davidson (latest edition) • Clinical Medicine by Parveen J Kumar & Michaell Clark • Oxford Handbook of Medicine • Macleod's Clinical Examination book • Medicine and Toxicology by C.K. Parikh • Hutchison's Clinical Methods by Michael Swash. 21st edition
Pharmacology And Therapeutics	• Katzung and Trevor's Pharmacology: Examination and Board Review- 15th Edition • Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 16th Edition- • Current Medical Diagnosis and Treatment- reference book – Edition-2024 • Basic and Clinical Pharmacology by Bertram G Katzung (case

	scenarios only) - 15th Edition • Basic and Clinical Pharmacology by Katzung, McGraw-Hill. 16th Edition • Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins 8th Edition. • Katzung Basic and Clinical pharmacology, Lippincot Illustated reviews. • Clinical Pathology Interpretations by A. H. Nagi
Behavioural Sciences	• Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition • Medical and Psychosocial aspects of chronic illness and disability 6th edition by Donna R.Falvo and Beverely E.Holland, • Integrating behavioral sciences in healthcare, Asma Humayun,2003, 1st edition
Community medicine	• Parks Textbook of Preventive and Social Medicine. K. Park • Public Health and Community Medicine by Ilyas Ansari • MSDS manual of Government of Punjab • Text book of Community Medicine by Park J E. Latest Edition
Surgery	• Bailey & Love's Short Practice of Surgery (latest edition) • Browse's Introduction to the Symptoms & Signs of Surgical Disease 4th Edition • Bailey & Love Short Practice of Surgery, Clinical Surgery pearls by Dayananda Babu RACS for Surgical Audits.
Patient Safety	• Patient Safety Curriculum Guide: Multi Professional Guide
Microbiology	• Levinson's review of Microbiology • Medical Microbiology and Immunology by Levinson and Jawetz,
Pediatrics Medicine	• Nelson Textbook of Pediatrics • Basis of Pediatrics by Pervez Akbar Khan
Gynecology	• Gynecology by Ten Teachers
Infection Control	• National Guidelines Infection Prevention and control, National Institute of Health Pakistan

Biosafety	• Biosafety in Microbiological and Biomedical Laboratories, 6th Edition (CDC, USA) • WHO Laboratory Biosafety Manual, Fourth Edition, And Associated Monographs • WHO safe management of wastes from healthcare facilities chapter 7 -8 page 77-99, 105-125)
Family medicine	• Oxford Handbook of General Practice, 5th Edition
Orthopedics	• Apley and Solomon's System of Orthopaedics and Trauma by Ashley Blom (Editor)
Rheumatology	• Davidson's Principles and Practice of Medicine • Clinical Medicine by Parveen J Kumar & Michaell, Clark • Hutchison's Clinical Methods by Michael Swash
Radiology	• Aids to Radiological Differential Diagnosis by Chapman S. and Nakielny R. 4th edition. Elsevier Science Limited; 2003
Forensic Medicine	• Knight's Forensic Pathology by Barnard Knight 3rd edition • G. Principles and Practice of Forensic Medicine by Prof. NasibR. Awan,2nd edition • Forensic DNA Typing – 2nd Edition, Author: John M. Butler • Parikh's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology by C.K. Parikh 6th Ed., CBS Publisher. • Gun Shot Wounds 2nd edition by V.J.Deimaio • Knight B. Simpson's Forensic Medicine. • Knight and Pekka. Principles of Forensic Medicine
Forensic Pathology	• Forensic pathology 2nd edition by V.J.Deimaio CRC press Boca Raton London New York Washington DC
Toxicology	• Principles of clinical toxicology 3rd edition Thomas. Gossel CRC press Taylor and Francis group
Forensic Sciences	• Fundamentals of Forensic Science- 3rd Edition: Author: Max M Houck, Jay A. Siegel • Text Book of forensic medicine and toxicology Principles and Practice 5th edition by Krishan Vig
Biomedical ethics	• Principles of Biomedical ethics, 8th edition by Tom. L.

	Beauchamp, James F. Childress.
Evidence Based Medicine	• Databases for the latest articles/manuscripts • Clinical Practice Guidelines- local and international - (within last 3 years) • Books (Latest edition-within last 5 years)
Pediatrics	• Nelson's Book of Pediatric 22 edition Illustrated book of Pediatrics, Pervaiz Akbar textbook peads medicine
Islamiyat	• Standard Islamiyat (compulsory) for B.A, BSc, MA, MSc, MBBS by Prof M Sharif Islahi • IImi Islamiyat (compulsory) for BA, BSc & equivalent.