STUDY GUIDE

Block - 6

Neurosciences - I

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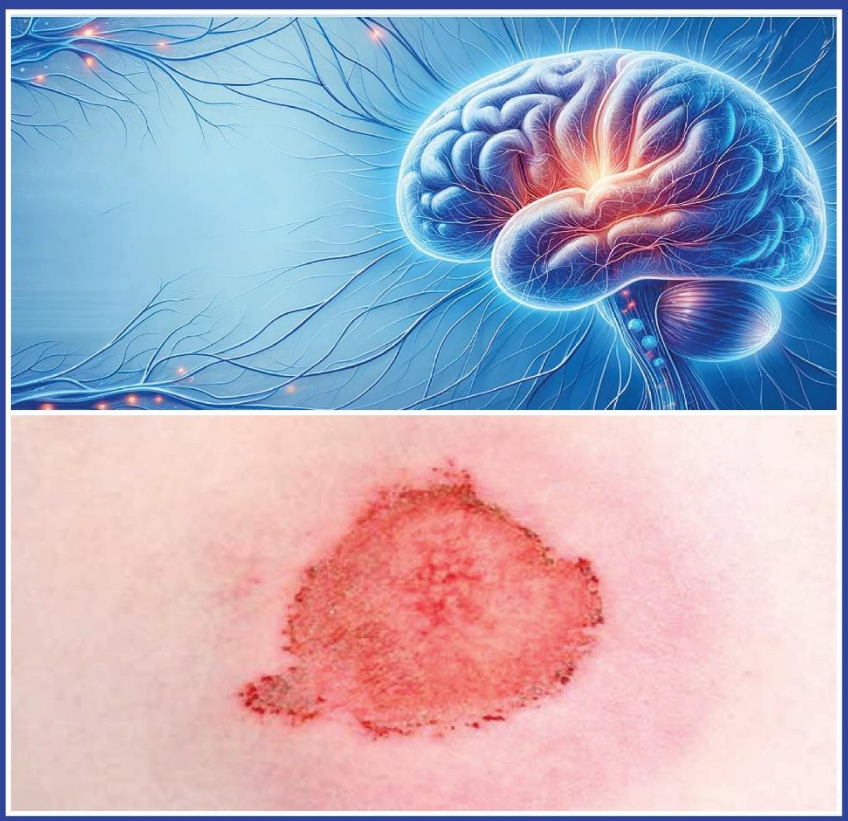
Inflammation Module

2nd Year MBBS



Department of Medical Education

Aziz Fatimah Medical & Dental College

Faisalabad

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1. List of Abbreviations

Abbreviations	Subjects
A	Anatomy
ABG	arterial blood gas
Ag	Aging
AKI	acute kidney injury
ALT	alanine transaminase
AMP	Adenosine monophosphate
ANS	Autonomic Nervous System
AST	aspartate aminotransferase
AV	Atrioventricular
B	Biochemistry
BhS	Behavioral Sciences
C	Civics
CBC	Complete Blood Count
C-FRC	Clinical-Foundation Rotation Clerkship
CK	Creatine kinase
CM	Community Medicine
CNS	Central Nervous System
CO	Carbon monoxide
CO2	Carbon dioxide
COPD	Chronic obstructive pulmonary disease
COX	cyclooxygenase
CPR	Cardio pulmonary Resuscitation
CT	Computed tomography
CV	Cardiovascular

ECG	Electrocardiography
ECP	Emergency contraceptive pills
EEG	Electroencephalogram
EnR	Endocrinology & Reproduction
ENT	Ear Nose Throat
ER	Emergency Room
F	Foundation
FEV1	Forced Expiratory Volume 1
FM	Forensic Medicine
FVC	Forced Vital Capacity
GFR	Glomerular Filtration Rate
GIT	Gastrointestinal tract
GMP	guanosine monophosphate
GO	Gynecology and Obstetrics
GTO	Golgi Tendon Organ
HCL	Hydrochloric acid
H & E	Hematoxylin and eosin
HL	Hematopoietic & Lymphatic
HMP	Hexose Monophosphate
HNSS	Head & Neck and Special Senses
ICF	Intra Cellular Fluid
IL	Interleukin
IN	Inflammation
INR	International Normalized Ratio
IUD	Intrauterine device
IUGR	Intra Uterine Growth Restriction

MSD	Musculoskeletal disorders
NEAA	non-essential amino acids
NMJ	Neuro Muscular Junction
NS	Neurosciences
O	Ophthalmology
Or	Orientation
P	Physiology
Pa	Pathology
PAF	Platelet activating factor
PBL	Problem Based Learning
PCR	Polymerase Chain Reaction
PDGF	Platelet derived growth factor
Pe	Pediatrics
PEM	Protein Energy Malnutrition
PERLs	Professionalism, Ethics, Research, Leadership
Ph	Pharmacology
PNS	Peripheral Nervous System
Psy	Psychiatry
PVC	Premature Ventricular Contraction
QALY	Quality-Adjusted Life Year
QI	Quran and Islamiyat
R	Renal
Ra	Radiology
RBCs	Red Blood cells
RDA	Recommended Dietary Allowance
Re	Respiratory

2. Curriculum 2k23 Framework

YEAR	MODULES	
YEAR 1	• Foundation-1 • Hematopoietic & Lymphatic	**Block 1**
	• Musculoskeletal & Locomotion-1	**Block 2**
	• Cardiovascular-1 • Respiratory-1	**Block 3**
	• PERLs 1 • Quran-1 • Islamiyat & Pak Studies	**Will be taught throughout the year**
	• Clinical Skills Foundation C-FRC **1** (Clinical – Foundation, Rotation, Clerkships)	
YEAR 2	• GIT & Nutrition • Renal • Endocrinology & Reproduction • Neurosciences • Head & Neck, Special Senses • Inflammation • PERLs - 2 • Quran-2 • Islamiyat & Pak Studies	
	• Clinical Skills Foundation C-FRC **2** (Clinical – Foundation, Rotation, Clerkships)	
YEAR 3	• Foundation-2 • Infectious Diseases • Neoplasia • Musculoskeletal & Locomotion-2 • Hematopoietic, Immunity & Transplant-2	

	• Cardiovascular-2 • Respiratory-2 • Forensic medicine • Community Medicine & family Health-1 • PERLs - 3 • Quran-3
	• Clinical Rotations C-FRC **3** (Clinical – Foundation, Rotation, Clerkships)
YEAR 4	• Renal-2 • Endocrine & Reproduction-2 • GIT & Nutrition-2 • Neurosciences-2 • Maternal & Child Health • Ophthalmology • Otorhinolaryngology • Community Medicine & family Health-2 • Psychiatry & Behavioral Sciences • PERLs - 4 • Quran-4 • **Electives** • **BLS workshop**
	• Clinical Rotations C-FRC **4** (Clinical – Foundation, Rotation, Clerkships)
YEAR 5 (Clerkships)	• Gynecology & Obstetrics • Pediatrics • Medicine • Surgery **Clinical Clerkships** C-FRC **5** (Clinical – Foundation, Rotation, Clerkships)

3. 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.

4. Block–6 Module Committee

BASIC HEALTH SCIENCES	CLINICAL SCIENCES
Anatomy: Prof. Dr. Quddus Ur Rehman	**Medicine:** Prof. Dr. Ghulam Abbas Sheikh
Physiology: Prof. Dr. Farah Amir Ali	**Surgery:** Prof. Dr. Sarwat Saqib
Biochemistry: Prof. Dr. Shakeel Ahmad Dr. Saira Saad	**Radiology:** Prof. Dr. Fatima Imran
Community Medicine: Prof. Dr. Humayun Suqrat	**Gynecology:** Prof. Dr. Nazia Mussarat
Pathology: Prof. Dr. Kashif Baig	**ENT:** Prof. Dr. Muhammad Saleem
Pharmacology: Dr. Sarwat Jahan	**Eye**: Prof. Dr. Muhammad Ahmad
Behavioral Sciences: Dr. Subhan Ansari	
Medical Education: Dr. Ayesha Sadiq	

Block Coordinator	**Dr. Mahrukh**

Principal AFMDC	**Prof. Dr. Muhammad Saeed**

NEUROSCIENCES-1 MODULE

5. Introduction of Neurosciences-1 Module

The Neurosciences component of the 2nd-year MBBS curriculum provides an in-depth exploration of the structure, function, and pathology of the central and peripheral nervous systems. Students will study the neural pathways, mechanisms of signal transmission, and key neurophysiological processes that underpin normal brain and nerve functions. The module covers a range of neurological disorders, including neurodegenerative diseases like Alzheimer's and Parkinson's, cerebrovascular accidents such as strokes, and demyelinating diseases like multiple sclerosis. Emphasis is placed on understanding the clinical presentation of these conditions, diagnostic tools such as neuroimaging, and the latest therapeutic approaches. This segment equips students with a strong foundation in neurology, bridging basic sciences and their application to medical practice.

5.1. Module Rationale

The neurosciences module is crucial as understanding the brain and nervous system is essential for diagnosing and treating a wide range of neurological and psychiatric conditions. This includes conditions such as Alzheimer's disease, Parkinson's disease, epilepsy, migraines, traumatic brain injuries, depression, schizophrenia, and autism. By studying neurosciences, medical students will gain the knowledge and skills necessary to accurately diagnose and effectively treat these conditions.

5.2. Module Outcomes

- Describe the neuroanatomy, histology and embryology of the central nervous system.
- Discuss the physiology of Autonomic Nervous System (ANS), motor and sensory system.
- Explain the pathophysiology of common diseases pertaining to the nervous system.
- Explain a basic management and prevention plan for common neurological disorders.
- Appreciate the burden of neuroscience disorders and their psychosocial impact.

5.3. Learning Objectives

5.3.1. Knowledge

- **Anatomy**

Topic	Sub Topic	Learning objectives
Gross Anatomy	Nervous system	• Describe the basic organization of nervous system • Identify and describe the components of the Nervous system and their function
	Spinal Nerves	• Trace the Origin, exit from vertebral canal, branches & Distribution of typical spinal nerve.
	Spinal cord Clinical correlates (Spinal cord) NS	• Identify the Location, Extent, Coverings and Blood supply of spinal cord • Discuss & tabulate nuclear organization at different levels of Spinal cord. • Describe, draw & label the transverse section of spinal cord at mid cervical level showing ascending & descending tracts • Tabulate the sensory nerve endings, and anatomical sites of first, second, third order neurons of ascending tracts Tabulate first, second, third order neurons of descending tracts. • Elaborate on the Cross-sectional details of white and gray matter of cervical, thoracic and lumbar segments of Spinal cord for localization of site of lesion.
	Brainstem	• Differentiate clearly between upper and lower motor neuron lesions • Location, Relations, Blood supply and external features of medulla, pons midbrain. • Cross sectional details of white and grey matter of Brain stem (mid brain, pons, medulla) • Discuss clinical correlates of brain stem • Medial and lateral medullary syndrome Weber syndrome, Benedikt syndrome
	Cerebellum	• Location, Relations, Functional classification & Blood supply along with major connections of Cerebellum (Cerebellar Peduncles) • Define important clinical correlates

	Cerebrum	• Identify the Lobes, Sulci & Gyri, Cortical areas. Describe Venous drainage and arterial supply of each lobe • Describe Functional areas of cerebrum. Draw and Label Homunculus. Define important clinical correlates • Describe internal structure of cerebral hemisphere; 1. white matter 2. Basal ganglia 3. Lateral ventricle
	Limbic system. Reticular formation	• Describe components & functions of Limbic system & Reticular formation
	Cranial nerves	• Explain the origin, exit from the brain and intracranial course of cranial nerves • Describe the Functional Components and specific functions of each cranial nerve
	Diencephalon	• Identify the Location and sub division of Diencephalon.
	Thalamus and hypothalamus	• Discuss the Location, Relations, Blood supply, nuclei and major connections of Thalamus, Hypothalamus, Epithalamus, Subthalamus, Metathamalus • Describe and Illustrate the Hypothalamic and pituitary gland Nuclei with their functions, location afferents. Describe the Hypothalamo-Hypophyseal Portal System • Describe the functions of Hypothalamus Explain the anatomical basis for the Thalamic Cauterization, Thalamic Pain, Thalamic Hand and Hypothalamic Disorders
	Intracranial fossa	• Explain the Gross anatomy of Intracranial fossae with intracranial foramina
	Meninges	• Explain the attachments, blood supply and nerve supply of the meninges of the brain
	Dural venous sinuses	• Discuss the Origin, tributaries & area of drainage, termination of Dural venous sinuses
	CSF	• Explain the Formation, circulation and absorption into venous system of CSF (Cerebrospinal fluid) • Describe ventricular system, Lateral, 3rd & 4th ventricle
	Blood supply of brain & spinal cord	• Discuss the Origin, course, branches and distribution of internal carotid artery, vertebral artery Formation, Location,

		branches and area of supply of Circle of Willis
	ANS	• Explain the Major subdivision of ANS into Sympathetic and parasympathetic nervous system with comparison of anatomical differences.
	Autonomic ganglia	• Describe the Location, connections and functions of autonomic ganglion
	Sympathetic chain	• Explain the origin, termination and branches of the sympathetic chain Localize spinal cord lesions
Embryology & Post-Natal Development	Neural tube development	• Explain the Development of Neural tube and Brain vesicles. Discuss related clinical anomalies
	Spinal cord development	• Describe the development of the spinal cord and related clinical anomalies
	Pituitary gland	• Describe development of Pituitary gland
Microscopic Anatomy (Histology & Pathology)	Nervous tissue	• Describe the histological structure of Nervous tissue, Neuron, Nerve fiber, Sensory & motor nerve endings, Neuroglia, Blood brain barrier, ganglia
	Spinal cord	• Describe the histological structure of the spinal cord
	Cerebrum, Cerebellum	• Describe the histological structure of Cerebrum, Cerebellum

➢ Physiology

Topic	Sub Topic	Learning objectives
Medical Physiology	Organization of Nervous System, Neurons and Synapses	• Describe the general organization of nervous system • Organization of Nervous System, Neurons and Synapses • Classify synapses • Explain physiological anatomy of synapses • Describe the properties of synaptic transmission • Classify the substances that act as neurotransmitters • Classify all sensory receptors in the body • Enumerate the properties of receptors • Explain the mechanism of adaptation of receptors

		• Enlist the rapid adapting mechanism of receptors
	Nerve fibers	• Explain the properties of receptors • Explain the general classification of nerve fibers • Explain the numerical classification of nerve fibers • Explain Gasser classification of nerve fibers • Explain summation and its types
	Sensory areas of the brain	• Describe the sensory areas of brain • Enlist Brodmann number of sensory areas • Describe the effects produced by damage to each sensory area of brain • Describe the pathophysiology and features of personal neglect syndrome
	Somatic sensations	• Classify and explain somatic sensations
	Ascending Tracts/ pathways	• Enumerate the ascending tracts/Pathways
	Anterolateral System	• Name the sensations carried by Dorsal column medial lemniscus system DCMLS • Trace the pathway of DCMLS
	Pain	• Classify pain • Differentiate between slow pain and fast pain • Describe the analgesia system in brain and spinal cord • Describe the cause and features of Brown Sequard Syndrome
	Spinal cord	• Describe the Physiological anatomy of spinal cord • Name the anterior motor neurons and their location • Explain the Renshaw cells feedback • Classify the spinal cord reflexes according to number of synapses
	Muscle Spindle and stretch reflex	• Describe the structure & functions of Muscle spindle • Trace the reflex arc of stretch reflex • Discuss the clinical significance of stretch reflex
	Tone	• Define tone and how it is maintained
	GTO	• Trace the reflex arc of Golgi Tendon Organ GTO, Golgi tendon reflex • Explain the importance of Golgi tendon reflex
	Motor areas of the brain	• Name the motor areas of brain • Enlist Brodmann number of motor areas of

		brain • Explain the features produced due to damage to the motor areas
	Brainstem	• Enlist the functions of brain stem
	Descending tracts	• Enumerate the descending tracts • Describe the functions of Pyramidal tract Describe the effect of lesions in motor cortex of brain or pyramidal tract
	Location of motor neurons	• Discuss the location of upper and lower motor neuron • Explain the features of upper motor neuron lesion • Explain the features of lower motor neuron lesions
	Spinal shock and hemi section	• Define spinal shock • Enumerate and explain the stages of spinal shock • Describe the features of hemi section of spinal cord (at the level, above the level, below the level)
	Cerebellum	• Name the functional parts of cerebellum • Explain the functions of spinocerebellum • Describe the functions of cerebro cerebellum • Discuss the functions of vestibule cerebellum • Explain the clinical features of cerebellar disease
	Basal Ganglia	• Name the components of Basal ganglia • EXPLAIN the putamen and caudate circuits Enlist the neurotransmitters in basal ganglia and enlist the functions of basal ganglia • Enumerate and explain the clinical abnormalities of putamen circuit • Explain the pathophysiology and features of Huntington's disease • Explain the types of rigidity • Differentiate spasticity and rigidity • Define decerebrate rigidity
	Vestibular apparatus	• Enumerate the components of vestibular Apparatus • Name the sensory organs of vestibular apparatus Describe the role of vestibular Apparatus in maintenance of linear and angular equilibrium
	Limbic system	• Enlist the components of limbic system • Describe the functions of amygdala • Explain the effects of bilateral ablation of the

		amygdala—The Klüver-Bucy Syndrome • Explain the functions of hippocampus • Explain the functions of Hypothalamus • Explain Functions of Thalamus • Discuss the Thalamic syndrome
	Brain stem reticular formation	• define brain stem reticular formation (BRF), name the neurotransmitters of BRF, enlist functions of BRF, differentiate between the functions of Pontine and medullary reticular Formation
	EEG	• Enumerate and discuss the physiological basis of Electroencephalogram EEG waves
	Sleep	• Explain the types of sleep • Discuss the stages of slow wave sleep • Explain the changes in EEG during sleep wake cycle Enumerate the areas and hormones/ neurotransmitters involved in sleep Describe sleep disorders (narcolepsy, cataplexy, insomnia, somnolence, somnambulism, bruxism, nocturnal enuresis and sleep apnea)
	Epilepsy	• Enumerate different types of epilepsy Epilepsy • Explain the features and physiological basis and EEG waves in different types of epilepsy
	Memory	• Define memory • Classify memory on the basis of duration and information stored • Explain the Molecular Mechanism of Intermediate Memory • Enumerate the structural changes of long-term memory • Explain the higher intellectual functions of prefrontal association cortex Physiology • Explain the mechanism of consolidation of memory • Explain retrograde and anterograde amnesia • Explain the physiological basis and features of Alzheimer's disease
	Speech	• Enlist the areas of speech • Explain the functions of motor and sensory areas of speech Trace and explain the pathway of written and heard speech • Enlist the abnormalities of speech • Explain the features of motor aphasia • Elaborate the features of sensory aphasia • Define dyslexia, alexia, agraphia
	ANS	• Discuss Components of Autonomic nervous system

		• Explain the physiological anatomy of sympathetic and parasympathetic nervous system • Describe the types of adrenergic and cholinergic receptors • Explain the effects of sympathetic and parasympathetic on various organs/ system of body

➢ Medical Biochemistry

Topic	Sub Topic	Learning objectives
Medical Biochemistry	Digestion and absorption of lipids	• Explain the digestion and absorption of lipids with enzymes involved in it. Discuss role of bile acids and salts in lipid digestion and absorption
	Lipid transport and storage	• Explain the concept of lipid transport and storage
	Sphingolipidosis	• Discuss the reactions of beta-oxidation, alpha and omega oxidation of unsaturated and saturated fatty acids • Calculate energy yield from palmitate in oxidation
	Carnitine shuttle	• Discuss role of carnitine shuttle
	Citrate shuttle	• Discuss the role of citrate shuttle in fatty acid • synthesis
	Fatty acid synthesis	• Explain the pathway of fatty acid synthesis and its regulation • Explain the steps of the reactions of hepatic ketogenesis and regulation
	Metabolism of phosphor and sphingolipids	• Describe utilization of ketone bodies by extrahepatic tissue. • Describe the Synthesis and degradation of phospholipids and sphingolipids interpret the disorders related to enzyme deficiencies.
	Glycolipid metabolism	• Discuss the metabolism of glycolipids interpret the disorders related to enzyme deficiencies.
	Fast feed cycle	• Explain fast feed cycle with reference to pathways activated and suppressed in each tissue in starved and fed state • Discuss integration of metabolism
	Neurotransmitters	• Explain fast. Discuss the structure,

		biochemical function and metabolism, dopamine, serotonin, histamine, GABA • Correlate the biochemical functions of these neurotransmitters with their deficiency diseases
	Oncogene	• Explain proto-oncogene and oncogene concept.
	Tumor markers	• Discuss tumor markers and their significance.
	Cancer	• Explain the role of genetics in cancers especially breast, ovary, lung and colon.
	Xenobiotics	• Discuss the concept of xenobiotics.

➢ Aging

Topic	Sub Topic	Learning objectives
Aging	Dementia	• Define dementia • Discuss various causes for dementia • Discuss various risks for dementia • Outline management strategies

➢ Pathophysiology and Pharmacotherapeutics

Topic	Sub Topic	Learning objectives
Pharmacology	Opioids	• Classify various opioid receptors • Describe Mechanism of Action (MOA), pharmacological actions, clinical uses and adverse effects of opioid agonist, mixed agonist –antagonist and antagonist
	CNS stimulants & depressants	• Classify various CNS stimulants and depressants • Describe MOA, pharmacological actions, clinical uses and adverse effects of CNS stimulant and depressants
Pathology	CVA	• Define cerebral vascular accident (CVA). Discuss the etiology and morphological changes of Cerebrovascular accidents
	Meningitis	• Define Meningitis • Identify types of meningitis

➢ Disease Prevention & Impact

Topic	Sub Topic	Learning objectives
Behavioral Sciences	Learning and Behavior	• Explain the theoretical basis of classic conditioning, operant conditioning and observational learning with examples in medical practice • Incorporate learning principles to help prepare people for medical interventions
	Memory	• Outline the structure of memory and explain the distinction between short- and long-term memory. • Describe memory improvement techniques and how the appropriate ones will help patients recall long and complex explanations
Community Medicine	Epidemiology of Mental Disorders	• Students should be able to depict the depth of problem in context of mental illnesses
	Community Based interventions for Mental Illnesses	• Able to learn the general approach to prevent mental illnesses at community level
Medicine	Stroke/CVA	• Identify various types of CVA (cerebrovascular accident) • Describe various symptoms and signs • Outline management strategies
	Epilepsy	• Define Epilepsy • Enlist various types of epilepsy • Identify various symptoms and signs • Outline management strategies
	Meningitis	• Enlist various types of meningitis • Describe symptoms and signs • Outline management strategies
Surgery	Stroke/CVA	• Discuss the role of surgery in stroke
	Head injury	• Describe triage in ER Emergency Room
	Hematoma/ CVA	• Identify the various types of hematomas
Pediatrics	Cerebral Palsy	• Describe the clinical features of Cerebral Palsy

5.3.2. Skills

- **Practical**

Topic	Sub Topic	Learning objectives
Histology	CNS	• Identify draw & label light microscopic structure of Peripheral nerve sensory ganglia, autonomic ganglia
	Cerebrum	• Identify Draw & label the light microscopic structure of the spinal cord
	Cerebellum	• Identify Draw & label the light microscopic structure of the Cerebrum
	Spinal Cord	• Identify Draw & label the light m structure of the Cerebellum
Biochemistry	Data Interpret	• Interpret the lysosomal storage diseases on given data Neiman pick disease, Gaucher's disease etc.
	Triglycerides estimation	• Perform the estimation of triglycerides by kit method
Physiology	Sensory system	• Examine the Sensory System
	Superficial Reflexes	• Examine the Superficial Reflexes
	Deep Reflexes	• Examine the Deep Reflexes
	Cerebellar Tests	• Demonstrate Cerebellar Function Test
	CN VII	• Demonstrate the testing of Cranial Nerve (CN) VII
	CN X, XI, XII	• Demonstrate the Testing of Cranial Nerves (XI, XII)
	Motor system	• Examine the Motor system

5.3.3. C-FRC for Neurosciences-1 Module

NEUROSCIENCES-1 MODULE		
Objectives	**Skill**	**Miller's Pyramid Level Reflected**
Assess Glasgow Coma Scale	GCS	Shows
Interpretation of Normal CT brain	CT scan interpretation	Knows how

INFLAMMATION MODULE

6. Introduction of Inflammation Module

The Inflammation component of the module focuses on the biological and pathological aspects of the body's immune response to injury, infection, and disease. Students will delve into the molecular and cellular mechanisms underlying acute and chronic inflammation, exploring the role of immune cells, cytokines, and inflammatory mediators. The module also examines the impact of inflammation on various organ systems, with particular attention to diseases where inflammation is a key player, such as autoimmune conditions and infections affecting the nervous system. Through case studies and clinical examples, students will understand the dual role of inflammation as both a protective response and a contributor to disease pathology, as well as the therapeutic strategies for managing inflammatory conditions.

6.1. Module Rationale

The objective of teaching inflammation to undergraduate students is to impart knowledge about cellular and molecular mechanisms of cell injury, inflammation, and repair. This understanding serves as the foundation for comprehending most disease processes within the body. It equips students to apply this knowledge in the clinical field when working with real-life patients.

6.2. Module Outcomes

- Define inflammation and describe its fundamental characteristics.
- Explain the cellular and molecular mechanisms that underlie the inflammatory response.
- Differentiate between acute and chronic inflammation
- Discuss the physiological role of inflammation in tissue repair and host defense.
- Identify how dysregulated inflammation contributes to the pathogenesis of various diseases.
- Describe the key inflammatory mediators, including cytokines, chemokines, and prostaglandins.
- Illustrate the signaling pathways involved in the initiation and resolution of inflammation.
- Recognize the roles of different immune cells (e.g., neutrophils, macrophages, lymphocytes) in the inflammatory response.
- Discuss the pharmacological aspects of steroidal and non-steroidal anti- inflammatory drugs
- Discuss the clinical aspects of inflammation.

6.3. Learning Objectives

6.3.1. Knowledge

- **Normal Structure**

Topic	Sub Topic	Learning objectives
Embryology & Post-Natal Development	Role of Inflammation in Implantation & Development of Integumentary System	• Identify role of inflammation in implantation • Development of cells involved in acute & chronic inflammation • Development of integumentary system
Microscopic Structure Histology	Integumentary system & Inflammatory Response at Cellular Level	• Discuss the microscopic structure of components involved in inflammation (cells, capillaries) • Discuss the histology of integumentary system

- **Medical Biochemistry**

Topic	Sub Topic	Learning objectives
Medical Biochemistry	Eicosanoids	• Explain the biochemical and therapeutic roles of eicosanoids (prostaglandins, leukotrienes, thromboxane and prostacyclin

- **Pathophysiology and Pharmacotherapeutics**

Topic	Sub Topic	Learning objectives
Pharmacology	Prostaglandin analogues	• Enumerate prostaglandin analogues • Discuss the clinical use and adverse effect of prostaglandin analogues

	Anti-Inflammatory drugs	• Enlist anti-inflammatory drugs Differentiate between steroidal and non-steroidal anti-inflammatory drugs
	Steroidal anti-inflammatory drugs	• Discuss the mechanism of action, clinical usage, and adverse effects of steroidal anti-inflammatory drugs
	Non-steroidal anti-Inflammatory drugs (NSAIDs)	• Discuss mechanism of action, pharmacological effects, clinical usage, and adverse effects of non-steroidal anti-inflammatory drugs
	COX inhibitors	• Differentiate between selective and non-selective cyclooxygenase (COX) inhibitors • Differentiate between Aspirin and paracetamol Classify antihistamines • Discuss the role of histamines and antihistamines in inflammation and allergies, adverse effects and drug interaction
Pathology	Acute Inflammation	• Define acute inflammation • Enlist stimuli for Acute Inflammation Recognize microbes, necrotic cells, and foreign substances causing acute inflammation • Identify different components of

		inflammation • Define necrosis and explain its type with example
	Process of acute inflammation	• Discuss the role of vascular and cellular events in acute inflammation • Differentiate between transudate and exudate • Classify chemical mediators • Describe the different pathways of synthesis of chemical mediators and their role in clinical practice • Discuss the role of different chemical mediators in acute inflammation • Describe the different morphological patterns and outcomes of acute inflammation
	Chronic Inflammation	• Define chronic inflammation • Discuss the role of chronic inflammatory cells and mediators in chronic inflammation • Discuss the causes, pathophysiology and morphology of granulomatous inflammation • Classify mycobacteria Explain the pathogenesis, clinical manifestations and lab diagnosis of typical mycobacteria • Explain the pathogenesis, clinical manifestations and lab diagnosis of atypical mycobacteria
	Cell Repair	• Discuss the concept of Cell Proliferation, the Cell Cycle and Stem Cells in tissue repair • Discuss the role of Growth Factors, receptors, signal transduction and extracellular matrix Involved in Regeneration and Repair • Explain the types of healing along with the steps in scar formation • Identify the factors that influence the

		tissue repair • Discuss the complication of wound healing -keloid, Hypertrophy, Scarring

➢ **Aging**

Topic	Sub Topic	Learning objectives
Aging	Inflammatory changes & signaling molecules in Aging	• Explain inflammatory changes and role of leukotriene and cytokines in old age

➢ **Disease Prevention & impact**

Topic	Sub Topic	Learning objectives
Community Medicine and Public Health	Communicable Diseases	• Discuss the mode of transmission of communicable diseases • Explain the general concept of prevention of communicable diseases • Discuss the primary, secondary and tertiary prevention of acute and chronic diseases • Discuss the role of immunoprophylaxis and chemoprophylaxis in prevention of communicable diseases
Behavioral Sciences	Role of Psychological stress in Inflammation	• Understand the correlation between psychological stress and inflammation

6.3.2. Skills

➢ **Practical's**

Topic	Sub Topic	Learning objectives
Histology	Integumentary System	• Draw and identify microscopic structure of integumentary system

6.3.3. C-FRC for Inflammation Module

INFLAMMATION MODULE		
Objectives	**Skill**	**Miller's Pyramid Level Reflected**
Learn how to do history taking	History Taking	Shows

7. Attitude

➢ PERL's for Block-VI

Code	Domain	Attribute	Specific Learning Outcome	Topic	Portfolio Entry
PERLs- 2-16	Professionalism	Self-Aware	Build a rapport with a stable patient	Rapport building Basics of Negotiation	Written report on patient encounter
PERLs- 2-17		Communicator	Demonstrate non-verbal, verbal communication skills with stable patients	Communication skills with the patients Appropriate verbal communication and appropriate non-verbal communication grounded in culture and context	Communication skills checklist filled by the observer
PERLs- 2-18	Leadership	Resilient & Adaptable	Demonstrate patience and tolerance with patients' relatives	Explaining decisions to relatives in terms that they understand Cultural and language sensitivity Art and science of listening	Reflection on encounter with patient attendants in a ward setting
PERLs- 2-19		Self-Directed Learner	Seek active feedback from peers and teachers	Difference between reflection and Feedback Techniques of receiving feedback	Feedback request generated by the student in specific areas and the reflection on the response received
PERLs- 2-20			Seek membership in one of the student clubs or societies within or outside the institution.	Medical Societies and clubs that provide membership to the student Bylaws, formation and registration of societies and clubs	Membership proof of any one club or society
PERLs- 2-21	Research	Writer & Presenter	Write a literature review	Structuring of a literature review Academic writing essentials Plagiarism and its types	Literature review of at least 2000 words
PERLs- 2-22			Make a poster of the literature review	Anatomy of an academic poster Presenting a poster in academia	Poster

ASSESSMENT POLCIY AND TOS OF UHS

8. 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 Skills Session**

- Clinical skills are abilities health care professionals use when assessing, diagnosing and caring for patients. Clinical skills also describe applied medical knowledge, such as assessing bloodwork.

- **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.

- **Problem Based Learning**

  Problem-based learning (PBL) is a student-centered approach in which students learn about a subject by working in groups to solve an open-ended problem. This problem is what drives the motivation and the learning.

- **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

9. Assessment Methodologies

1. Theory

- **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 a number of distractors that are plausible but incorrect answers to the question.

- **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.

2. Practical

- **OSPE**

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

- **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.

10. Assessment Policy (UHS)

Statutes

1. The first professional MBBS shall be held at the end of first year MBBS whereas, the second Professional MBBS Examination shall be held at the end of the second year.
2. Every candidate shall be required to study contents of Anatomy (including Histology), Physiology, Biochemistry, Behavioral Sciences, Community Medicine & Public Health, Pathology, Pharmacology & Therapeutics, Islamic Studies/Ethics and Pakistan Studies, 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 first professional examination, and four papers in the second professional examination

   First Professional Exam:

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

   Second Professional Exam:

   a) Paper 1 will be based on contents of Block 4;
   b) Paper 2 will be based on contents of Block 5;
   c) Paper 3 will be based on contents of Block 6;
   d) Paper 4 will be based on contents of Islamic Studies/Civics and Pakistan Studies;

4. Each paper will comprise of two components 'Written' and 'Oral/Practical/Clinical' examinations.
5. The 'Written' and 'Oral/Practical/Clinical' examinations in each paper will carry 150 marks each, making the total marks of 300 for each paper of papers 1, 2 and 3 (inclusive of internal Assessment).
6. Total marks for the First and Second Professional Examination shall be 900, each. Marks of Islamic Studies/Civics and Pakistan Studies shall not be counted towards total marks of any professional examination and determination of positions or merit of the candidate. However, the candidates shall have to take the examination in the subject in their Second Professional MBBS Examination. Those failing the subject in both annual & supplementary examinations, while passing all the other subjects of Second Professional Examination shall be promoted to the 3rd year MBBS, however they will be allowed two more attempts to clear the subject with professional Examination of the next session, failing which they shall be detained in the 3rd Professional MBBS.
7. Major content areas of the first two professional years shall be from:
   a. Anatomy including applied/clinical/Anatomy
   b. Physiology including applied/clinical/Physiology
   c. Biochemistry including applied/clinical/ Biochemistry
8. The Applied/Clinical content for the Anatomy, Physiology and Biochemistry shall be based on clinical correlations.

9. Integrated clinical content areas for the both years include Behavioral Sciences, Community Medicine & Public Health, Pathology, Pharmacology & Therapeutics, Clinical Foundation- 1& II and PERLs- 1 & II.

10. Written Examination

d. The written component of Papers 1, 2, and 3 will consist of 'One-best-type' Multiple Choice Questions (MCQ) and Structured Essay Questions (SEQ) in a ratio of 70:30 %.
e. Each MCQ will have five options (one best response and four distractors) and will carry one (01) mark.
f. There will be no negative marking.
g. There will be no sections within an SEQ, and it will be a structures question with five (05) marks each.
h. SEQ's will only be based on the major content areas of the year.
i. There will be total of 85 MCQs and 07 SEQs in every written paper in Papers 1, 2 and 3.
j. The duration of each written paper will be 180 minutes (03 hours).
k. The MCQ section will be 110 minutes duration and the SEQ section 70 minutes.

11. Oral/Practical/Clinical Examination

a. The Oral/Practical/Clinical examination of each Papers 1, 2, and 3 will consist of a total of twelve (12) OSPE/OSCE/OSVE stations in each Oral/Practical/Clinical examination.
b. There will be seven (07) Observed OSPE (Objective Structured Practical Examination) stations from major subject areas. Each OSPE 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 two (02) Observed OSCE (Objective Structured Clinical Examination) stations, 01 from C-FRC1 and PERLs-1 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 evaluation of the underlying principle relevant to that practical with a component of applied/practical knowledge and related clinical application.
e. Each OSPE/OSCE will carry eight (08) marks.
f. Each OSVE station will carry 16 marks
g. The duration of each Oral/Practical/Clinical examination will be 120 minutes (2 hours).
h. Time for each OSPE, OSCE and OSVE station will be eight (08) minutes.

12. Every candidate shall take the examination in the following Blocks (Modules) in First & Second Professional MBBS Examination:

Year 2

a. Block 4 (Gastrointestinal Tract & Nutrition- Renal-1) Marks 300
b. Block 5 (Endocrinology & Reproduction Head & Neck, Special Senses) 300 Marks
c. Block 6 (Neurosciences-1+ Inflammation) Marks 300
d. Islamic Studies Civics Pakistan Studies Marks 100

A. Block 5 (Endocrinology & Reproduction-1 + Head & Neck, Special Senses)

The examination in Block 5 shall be as follows

I. One written paper of 120 marks having two parts

a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total 85 marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negative marking.

b. Part II shall have seven Structured Essay Questions (SEQs) of total 35 marks (05 marks for each SEQ) and the time allotted shall be 70 minutes.

II. Oral Practical/Clinical examination shall have 120 marks in total.

III. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 60 marks, e 20% of the total allocated marks (300) for the block the score will be equality distributed to the Written and Oral/Practical Clinical Examinations.

B. Islamic Studies/Civics and Pakistan Studies

The examination in Islamic Studies/Civics and Pakistan Studies shall be as follows:

I. One written paper of 100 marks in Islamic Studies/Civics and Pakistan Studies having two components:

a. Islamic Studies/Civics component having total 60 marks. There will be three (3) Long Essay Questions (LEQs) to be attempted out of Five (5), having 20 marks each.

b. Pakistan Studies component having total 40 marks. There will be two (2) Long Essay Questions (LEQs) to be attempted out of Four (4), having 20 marks each.

YEAR-2						
Block 4 **Modules** (GIT & Nutrition-I + Renal-I)	Part I MCQs (85)	85 Marks	Practical / Clinical Examination	07 OSPE 02 OSCE 03 OSVE	Marks 56 16 48	**300**
	Part II SEQS (7)	35 Marks				
	Internal Assessment 10%	30 Marks	Internal Assessment 10%	30 Marks		
	Total	**150**	Total	**150**		
Block 5 **Modules** (Endocrinology & Reproduction-I + Head& Neck, Special Senses)	Part I MCQs (85)	85 Marks	Practical / Clinical Examination	07 OSPE 02 OSCE 03 OSVE	Marks 56 16 48	**300**
	Part II SEQS (7)	35 Marks				
	Internal Assessment 10%	30 Marks	Internal Assessment 10%	30 Marks		
	Total	**150**	Total	**150**		
Block 6 **Modules** (Neurosciences-I + Inflammation)	Part I MCQsPart II SEQS	85 Marks 35 Marks	Practical / Clinical Examination	120 Marks		**300**
	Internal Assessment	30 Marks	Internal Assessment	30 Marks		
	Total	**150**	Total	**150**		
	Total Marks					**900**
Islamic Studies/ Civics and PakistanStudies	**Islamic Studies/Civics** 3 LEQs of 20 marks each			60 Marks		**100***
	Pakistan Studies 2 LEQs of 20 marks each			40 Marks		
	Total			**100**		

- Total marks for the First and Second Professional Examination shall be 900, each. Marks of Islamic Studies/Civics and Pakistan Studies shall not be counted towards total marks of any professional examination, and determination of position or merit of a candidate. However, the candidate shall have to take the examination in the subject in their Second Professional MBBS Examination. Those failing the subjects in both annual & supplementary examination, while passing all the other subjects of Second Professional Examination shall be promoted to the 3rd year MBBS, however they will be allowed two more attempts to clear the subject with Second Professional Examination of the next session, failing which they shall be detained in the 3rd Professional MBBS.

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

14. At least 25% MCQ & 25% SEQ shall be based on applied/case/clinical scenarios to assess high order thinking in the papers set for the students of First and Second Professional MBBS Examination.

11. Exam Regulations by UHS

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 pre-requisites of the examination
    c. Has his/her marks of internal assessment in all the Blocks sent to the Controller Examinations by the Principal of the college along with the admission forms.
    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 (85%) of the full course of lectures delivered and practical conducted in the particular academic session in each Block, as well as in aggregate.
        III. Certificate of having appeared at the Block Examinations conducted by the college of enrolment with at least 50% cumulative percentage in aggregate of blocks 1, 2 and 3 for the first year and blocks 4, 5 and 6 for the second year.
        IV. Candidates falling short of lectures or practical shall not be admitted to the examination but may be permitted to appear at the supplementary examination if they make up the deficiency up to the commencement of the next examination by remaining on the rolls of a college as regular student, subject to fulfillment of all other mandatory requirements to appear at the examination.
2. The minimum number of marks required to pass this examination for each paper shall be fifty percent (50%) in Written and fifty percent (50%) in the Oral/Practical/Clinical examinations and fifty percent (50%) 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 First 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 second professional class till the commencement of supplementary examinations. Under no circumstances, a candidate shall be promoted to the second professional class till he/she has previously passed all the papers in the First Professional MBBS 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 the next class.
6. Any student who fails to clear First Professional Examination in four consecutive attempts, inclusive of both availed as well as un-availed, after becoming eligible for the examination, and has been expelled on that account shall not be eligible for continuation of studies and shall not be eligible for fresh admission as a fresh candidate in either MBBS or BDS. (Ref. UHS Circulars/137-20/2750 dated 23-11-2020).
7. The colleges may arrange remedial classes and one re-sit for black examination either with the subsequent block examination or before completion of the block, and before or during preparatory leave in case of the terminal block of the professional year, before issuance of the date sheet for the concerned professional examination, subject to the following condition:
    I. 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 to remedial classes and re-sit examination.
    II. 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
    III. The students can appear in re-sit of a block examination, along with the subsequent block, and before or during preparatory leave for the terminal black of the professional year, once the requirement of attendance is met with However conduct of remedial classes shall be permitted only in the cases of students, who shall have attended at least 50% of total attendance of the concerned block in the first instance
    IV. 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 death of an immediate relative/being afflicted by a natural calamity or disaster
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 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. ll 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 departments in the colleges.
12. The candidates shall pay their fee through the Principals of their respective colleges who shall forward a bank draft / pay order / crossed cheque in favor of Treasure, university of Health Sciences Lahore, along with their Admission Forms.
13. Only one annual and one supplementary of First and Second 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.

12. 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.

13. Table of Specification (TOS)

MBBS 2nd Professional
Block-6

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	24	03	39	03	-	01	40
Normal Function	Physiology applied/clinical	26	03	41	03	-	01	40
	Biochemistry applied/clinical	09	01	14	01	-	01	24
Disease Burden & Prevention	Community Medicine & Public Health	04	-	04	-	-	-	-
	Behavioral Sciences	03	-	03	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	12	-	12	-	-	-	-
	Pharmacology	07	-	07	-	-	-	-
CFRC	CF-2-3	-	-	-	-	01	-	08
PERLs	PERLs-2-3	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

14. Frame work of Block-6 Module Timetable 2023-24

AZIZ FATIMAH MEDICAL & DENTAL COLLEGE FAISALABAD
TIME TABLE 2nd YEAR MBBS CLASS SESSION 2023-24 (Block 6)

DAY	1	2	3	4	5	6	7
	08:00 am - 08:45 am	08:45 am - 09:30 am	09:30 am - 10:30 am	10:30 am - 11:30 am	11:30 am -12:30 pm	12:30 pm - 13:00 pm	13:00 pm - 14:00 pm
Monday	Dissection		Physiology Lecture	Biochemistry Lecture	Anatomy Lecture	Break/Namaz Break	Pathology Lecture
Tuesday	Dissection		Physiology Lecture	Practical/SGD A: Biochemistry/CFRC B: Physiology C: Anatomy			Pathology Lecture
Wednesday	Dissection		Physiology Lecture	Practical/SGD A: Biochemistry/CFRC B: Physiology C: Anatomy			Pharmacology Lecture
Thursday	Dissection		Biochemistry Lecture	Practical/SGD B: Biochemistry/CFRC C: Physiology A: Anatomy			Community Medicine/IBS Lecture
Day	08:00 am - 09:00 am	09:00 am - 10:00 am	10:00 am - 11:00 am	11:00 am - 12:00 pm	12:00 pm -13:00 pm		
Friday	Anatomy/Physiology SGD		Biochemistry Lecture	Anatomy Lecture	Physiology Lecture		Jummah Prayers
Saturday	Dissection		Physiology Lecture	Anatomy/Physiology SGD			Anatomy Lecture

RESOURCE BOOKS

15. Learning Resources

Anatomy	• Snell's Clinical Anatomy 10th ed. • Langman's Medical Embryology 12th ed • Medical Histology by Laiq Hussain Siddiqui 8th ed. • General Anatomy by Laiq Hussain Siddiqui 6th ed.
Physiology	• Guyton AC and Hall JE. Textbook of Medical Physiology, W.B. Saunders & Co. Philadelphia • Essentials of Medical Physiology by Mushtaq Ahmad
Biochemistry	• Harpers illustrated Biochemistry 32nd edition. Rodwell.V.W MCGrawHill publishers. • Lippincott illustrated Review 8th edition Kluwer.W. • Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.
Community Medicine	• Parks TextBook of Preventive and Social Medicine, K. Park(Editor) • Public Health and Community Medicine Ilyas Ansari(Editors)
Pharmacology	• Basic and clinical Pharmacology by Katzung. McGraw-Hill • Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins
Pathology	• Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders. • 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.
Medicine	• Davidson's Principles and Practice of Medicine
Surgery	• Bailey & Love Short Practice of Surgery
Islamiyat	• Standard Islamiyat (compulsory) for B.A, B.Sc, MA, Msc, MBBS by Prof. M Sharif Islahi • Ilmi Islamiyat (compulsory) mfor B.A, B.sc & equilent.
Behavioral Sciences	• Handbook of Behaioural Sciences by Prof. Mowadat H. Rana, 3rd Edition. • Medical and Psychosocial Aspects of Chronic illness and Disability Sixth Edition Donna R. Falvo, PHD Beverley E. Holland, PHD RN.