

Dow University of Health Sciences



FOUNDATION MODULE STUDY GUIDE 2023

First Year MBBS

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INTRODUCTION

WHAT IS A STUDY GUIDE?

A study guide provides a focus for different educational activities in which the students are engaged. It equips students with information on the topic of study and assists in management of student learning. Furthermore, it imparts relevant information about the organization of the module and thus helps students organize their educational activities accordingly. Another important purpose of a study guide is the dissemination of information about rules and policies and teaching and assessment methods.

HOW DOES A STUDY GUIDE HELP LEARNERS?

- Includes information on organization and management of the module.
- Advises the learners about representatives who can be contacted in case of need.
- Defines the outcomes and objectives which are expected to be achieved at the end of the module.
- Elaborates the teaching and learning strategies which will be implemented during the module.
- Inform learners about the learning resources in order to maximize their learning.
- Provides information about the assessment methods that will be held to determine every student's achievement of objectives.

CURRICULUM MODEL:

Integrated modular curriculum is followed at Dow University of Health Sciences for MBBS program. This implies that instead of studying basic and clinical sciences separate and apart, students will experience a balanced and integrated combination of basic and clinical sciences in the form of a system –based modules.

The modular curriculum followed by Dow University of Health Sciences is integrated both in the vertical and the horizontal directions. However, in order to prepare the students for clinical teaching with a sound background knowledge of the basic sciences, the curriculum has been divided in three spirals.

The three spirals are:

1. Spiral -1 Basic Sciences
2. Spiral -2 Clinical Sciences
3. Spiral -3 Integrated Supervised Practical Training

The Basic Sciences Spiral is spread over the first two years and Clinical Sciences Spiral is distributed over the next two years. In the final year students are given practical hands-on training in the role similar to that of a shadow house officer. The whole curriculum is divided into modules, each module being related to a particular system. For example, Cardiovascular 1 module is in the Basic Sciences Spiral-1 and Cardiovascular 2 module is in the Clinical Sciences Spiral-2 and the relevant practical and clinical teaching/learning will be accomplished in Final year Spiral-3.

TEACHING & LEARNING METHODOLOGIES:

The following teaching/ learning methods may be used to facilitate the learning process:

1. **Interactive Lectures:** Lectures are considered as an efficient means of transferring knowledge to large audiences.
2. **Small Group Discussion:** Small group discussion such as Demonstrations, tutorials and case- based learning (CBL) sessions facilitate interactive learning which helps students develop discussion skills and critical thinking.
3. **Practical:** Practical related to Basic Sciences are held to facilitate student learning.
4. **Skills:** Skills sessions are scheduled parallel with various modules at fully equipped Skills Lab and Simulation Lab in which students observe and learn skills relevant to the respective modules under guidance of Clinical Faculty.
5. **Self-Directed Learning (Self- Study):** Students have a measure of control over their own learning. They diagnose their needs, set objectives in accordance to their specific needs, identify resources and adjust their pace of learning

5 YEAR CURRICULAR ORGANIZATION

Spiral	year	Modules				
First Spiral	I	FND1- Foundation Cell, Genetics & Cell Death (Basics of Anatomy, Physiology, Biochemistry, Gen. Pathology, Gen. Pharmacology, Community Medicine & Behavioral Sciences, 9 Weeks		HEM1- Blood Module Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia 9 Week		
		LCM1- Locomotion Bones, Joints, Nerves & Muscles, 9weeks		RSP1- Respiratory System 6 weeks	CVS1- Cardiovascular System 4 weeks	
	II	NEU1- Nervous System 8 weeks		HNN1- Head & Neck & Special 6 weeks	END1- Endocrinology 5weeks	
		GIL 1-GIT and Liver 8 weeks		EXC1- Renal and Excretory System	REP1- Reproductive System 5 weeks	
Second Spiral	III	Foundation 2 2 wks	IDD 1- Infectious diseases 6 weeks	HEM2- Hematology 5 weeks	RSP2- Respiratory System 5 weeks	CVS2- Cardiovascular System 4 weeks
		GIL 2-GIT and Liver (including Nutritional Disorders) 8weeks			EXC2- Renal & Excretory System 4 weeks	END2- Endocrinology 5 weeks
	IV	ORT2- Orthopedics, Rheumatology, Trauma 7 weeks		PMR-Physical Medicine & Rehabilitation DPS-Dermatology Plastic Surgery / Burns GEN-Genetics 6 weeks		REP2- Reproductive System 8 Weeks
		NEU2- Neurosciences and Psychiatry 8 weeks			ENT* 4 weeks	OPHTHALMOLOGY/EYE 4 weeks
Third Spiral	V	Clinical Rotation 9:45 to 3:00 (with Ambulatory, Emergency, Intensive care) In Medicine, Pediatrics, Cardiology and Neurology units <ul style="list-style-type: none"> ▪ Lecture on problem based approach, twice a week ▪ Ward tutorial twice a week ▪ Student research presentation once a week 			Clinical Rotation 9:45 to 3:00 (Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres) In Surgery, Gynecology & Obstetrics, Orthopedics and Neurosurgery. <ul style="list-style-type: none"> ▪ Lecture on problem based approach, twice a week ▪ Ward tutorial twice a week ▪ Student research presentation once a week 	

OVERVIEW

Program	MBBS	
Year	One	
Module Title	Foundation	
Module Code	FND-1	
Duration	9 weeks	
Contact Hours	Gross anatomy	25
	Histology	20.5
	Embryology	28
	Biochemistry	39.5
	Physiology	22
	Pathology	28.5
	Pharmacology	8.5
	Community medicine	14
	Behavioral Sciences	4
	CBL	6
Skill Lab	3	
Total Hours	Foundation Module	199

Foundation Module



- | | | |
|-----------------|----------------------|-----------------------|
| ■ Gross anatomy | ■ Histology | ■ Embryology |
| ■ Biochemistry | ■ Physiology | ■ Pathology |
| ■ Pharmacology | ■ Community medicine | ■ Behavioral Sciences |
| ■ CBL | ■ Skill Lab | |

INTEGRATED MODULE COMMITTEE

RESPONSIBILITIES	NAMES	DESIGNATION	EMAILS
Chairperson Curriculum Committee, DUHS Chief Module coordinator	Prof. Naheed Khan	Prof. and Chairperson Anatomy	naheed.khan@duhs.edu.pk
Coordinator DMC	Dr. Sabahat Babar	Lecturer	sabahat.babar@duhs.edu.pk
Coordinator DIMC	Dr. Afshan Mehboob	Associate Professor	afshan.khan@duhs.edu.pk
Medical Education	Dr Syeda Rubaba Azim	Assistant Professor	rubaba.azim@duhs.edu.pk
	Dr. Munizha Nisar	Medical Simulation Facilitator	munizha.nisar@duhs.edu.pk

MODULE DESCRIPTION:

This module has been designed for students to introduce them to the basic concepts of biomedical sciences. This module includes Gross anatomy, Histology, Embryology, Physiology, Biochemistry, Microbiology Pathology, General Pharmacology, Behavioral sciences and Community medicine.

Lectures, tutorials, small group sessions including CBL and practical are important teaching methodologies of this module. Clinical skills such as learning to communicate effectively, assembling a first aid kit and providing appropriate first aid to patients with compassion and understanding is included in this module. Your co-operative and teamwork abilities will be improved by working in different teams. You will be able to develop problem solving skills to apply your medical knowledge to practical situations by means of group and individual tasks. This study guide has been developed to assist you and keep you focused to achieve your goals.

Welcome to the foundation module and it is hoped that students will be able to achieve the desired module learning outcomes.

RATIONALE:

A student stepping into a medical school requires orientation, and introduction to biomedical sciences with respect to health & disease. The student also needs certain guidelines to achieve goals to become a successful but ethical doctor in future. Foundation module provides integration of core concepts that underlie the foundation of basic sciences and their use in clinical sciences. This will eventually lead to develop critical thinking for integration and application of basic knowledge for clinical application.

Learning Outcomes, Objectives and Teaching & Learning Strategy (T/L) Strategies

Learning Objectives	Discipline	Topics/Contents	T/L	Assessment	Contact hours
Learning Outcome: Describe the levels of organization of the human body					
Conceptualize the integrated assembly of structures and functions in the human body by relating to the arrangement of different levels	Anatomy (Gross)	Levels of Organization	Interactive Lecture	MCQs	1
Learning Outcome: Discuss the General Pharmacology & the basic concepts of Pharmacodynamics & Pharmacokinetics					
Describe the basic concept of Pharmacokinetics and Pharmacodynamics Explain various important routes of drug administration Discuss the pharmacological concept of drug action and its	Pharmacology	Introduction to Pharmacology	Interactive Lecture	MCQs	1
		Routes of Drug Administration	Interactive Lecture	MCQs	1
		Pharmacokinetics (overview)	Interactive Lecture	MCQs	1
		Pharmacodynamics (overview)	Interactive Lecture	MCQs	1
		Adverse Drug Reaction and Drug – Drug Interactions	Interactive Lecture	MCQs	1

adverse effects		Factors modifying drug response/action	Interactive Lecture	MCQs	1
		Dosage of Drugs and calculations	Interactive Lecture	MCQs	1
	To explain different routes of drug administration for application in various clinical discussion	Routes of Drug Administration	Tutorial	MCQs Viva	1.5
2.Learning outcome: Describe the homeostatic mechanism and its importance in body functions					
Recognize the role of physiochemical aspects for the maintenance of homeostasis.	Physiology	<ul style="list-style-type: none"> • Body fluid compartments, (Extracellular fluid and Internal environment) 	Interactive Lecture	MCQs Viva	1
		<ul style="list-style-type: none"> • Homeostatic mechanism of major functional system 	Interactive Lecture	MCQS Viva	1
		<ul style="list-style-type: none"> • Effect of osmotic variations in ECF on cell 	Practical	OSPE	1.5
		<ul style="list-style-type: none"> • Electrolyte balance 	CBL		
	Biochemistr	<ul style="list-style-type: none"> • Biochemical aspects of Extra Cellular Matrix 	Interactive Lecture	MCQs Viva	1

	y	<ul style="list-style-type: none"> Introduction to the use of laboratory facilities/equipment. 	Practical	OSPE	1.5
Enlist different modes of transportation across the cell	Biochemistry	<ul style="list-style-type: none"> Basic of Water, Buffers and pH 	Interactive Lecture	MCQs Viva	1
		<ul style="list-style-type: none"> Preparation of solutions, normal solution and normal saline 	Practical Tutorial	OSCE	1.5 1.5
Role of enzymes in maintaining cell homeostasis		<ul style="list-style-type: none"> Enzymes: Structure, classification, and functions Enzymes: mechanisms of action 	Interactive Lectures	MCQs Viva	1 1
		<ul style="list-style-type: none"> Enzyme detection in the given sample 	Practical	OSPE	1.5
Explain the process of energy flow within the cell.		<ul style="list-style-type: none"> Energy flow within the Cell: Role of ATP in Bioenergetics 	Interactive Lecture	MCQS Viva	1
Learning outcome: Describe the anatomy, biochemistry, physiology, pathology of the cell					
Use the light microscope to identify the various tissues stained by H/E staining	Anatomy	Introduction to microscopy	Interactive Lecture Practical	MCQS Viva OSPE	1 1.5
	Physiology	To study the different parts of compound microscope	Practical	OSPE	1.5
Describe the composition and basic structure		Cell Introduction	Interactive Lecture	MCQS Viva ATP	1

<p>of cell membrane with its functional importance and adaptation</p> <p>Describe the anatomical details of the cell and its component parts</p>	<p>Anatomy (Histology)</p>	Cell membrane & Cytoplasm	Interactive Lecture	MCQs	1
		Cell Organelles (Rough Endoplasmic Reticulum, Golgi Apparatus, Ribosomes, Centrioles, Mitochondrion, Lysosomes, Peroxisomes)	Interactive Lecture Practical	MCQS Viva ATP	1 1.5
		<ul style="list-style-type: none"> Nucleus 	Interactive Lecture	MCQs	1
		<ul style="list-style-type: none"> Cell Inclusions (Lipid, Glycogen, Melanin, Lipofuscin, Lutein pigments & Secretory Granules) 	Interactive Lecture	MCQs	1
		<ul style="list-style-type: none"> Cytoskeleton (Microtubules, Filaments : Thick, Thin /Microfilaments, Intermediate) 	Interactive Lecture		1
		<ul style="list-style-type: none"> Cell Surface Modification (Microvilli, Cilia, Flagella) 	Interactive Lecture		1
	<p>Physiology</p>	Physiological role of cell organelle	Interactive Lecture Tutorial	MCQs Viva	1 1.5
<p>Identify the different types, occurrence, and role of macromolecules for health</p>	<p>Biochemistry</p>	<ul style="list-style-type: none"> The importance of Macromolecules in organization of living system Cell membrane: macromolecular organization and 	Interactive Lecture	MCQs viva	1 1

		composition			
		<ul style="list-style-type: none"> The techniques used to study macromolecules: Photometry. 	Practical	OSPE	1.5
Describe signal transduction mechanisms by cell surface receptors	Anatomy	Cell Junctions	Interactive lecture	MCQs Viva	1
	Physiology	Intercellular connection	Interactive lecture	MCQs Viva	1
		Cell signaling mechanisms: 1 st & 2 nd messengers	Interactive lecture	MCQs Viva	1
Learning outcome: Explain different modes of transportation across the cell membrane					
Describe the physiological basis of different types of transport mechanisms through cell membrane	Physiology	<ul style="list-style-type: none"> The cell membrane 	Interactive Lecture	MCQS Viva	1
		<ul style="list-style-type: none"> Membrane transport-passive 	Interactive Lecture	MCQS Viva	1
		<ul style="list-style-type: none"> Membrane Transport Active 	Interactive Lecture	MCQS Viva	1
		<ul style="list-style-type: none"> Membrane transport bulk 	Interactive Lecture	MCQS Viva	1

		<ul style="list-style-type: none"> Overview of membrane transport 	Tutorial	MCQS Viva	1.5 1
Learning Outcome: Define & illustrate stepwise mechanism of human development					
Describe the cell division and its types	Embryology	Mitosis + Cell Cycle	Interactive Lecture	MCQs ATP	1
		Meiosis + Comparison with Mitosis	Interactive Lecture	MCQs ATP Unobserved station with models/ Viva	1
		Genetic Disorders in the perspective of Meiosis	Interactive Lecture	MCQs	1
Identify the various stages of development of human embryo to understand the mechanism of developmental disorders and anomalies	Embryology	Gametogenesis: spermatogenesis and spermiogenesis	Interactive Lecture	MCQs/ ATP	1
		Oogenesis, Prenatal and Postnatal maturation of oocytes and comparison of gametes	Interactive Lecture	Quiz MCQs Viva OSPE	1
		Female Reproductive organs (Ovarian cycle+ menstrual cycle)-1	Interactive Lecture	Viva MCQs/ ATP/ Viva	1
		Female Reproductive organs (Ovarian cycle+ menstrual cycle)-2	Interactive Lecture CBL		1 1.5
		Transportation of ovum and Fertilization	Interactive Lecture		1
		1 st week of Development	Interactive Lecture		1

		after fertilization			
		First Week of Development After Fertilization (Clinical correlates)	Interactive Lecture	MCQs/ ATP/ Unobserved station with models/ Viva	1
		2 nd week of Development after fertilization	Interactive Lecture		1
		3 rd week of development I (Gastrulation, formation of primitive streak and notochord)	Interactive Lecture		1
		3 rd week of development II (Neurulation and development of somites)	Interactive Lecture/Simulation /video		1 1.5
		4 th to 8 th week of development	Interactive Lecture	MCQs Viva	1
		Fetal Period (9 th week till birth)	Interactive Lecture	MCQs Viva	1
Describe the interchange of substances between maternal and fetal blood by applying the knowledge of structure and functions of placenta and fetal membranes	Embryology	Fetal Membranes (Amnion Chorion, Umbilical cord and Yolk Sac)	Interactive Lecture Simulation Lab	MCQs Viva OSPE Spotting	1 1.5
		Placenta	Interactive Lecture Interactive Lecture CBL		1
		Multiple pregnancies			1 1.5
Correlate various birth defects with genetic factors and environmental teratogens		Teratogenesis	Interactive Lecture	MCQs Viva	1
Discuss the causes of infertility	Embryology	Prenatal Diagnosis	Interactive Lecture	MCQs Viva	1
		Infertility and its causes	Interactive Lecture		1

<p>Discuss the techniques of artificial fertilization.</p>	<p>Embryology</p>	<p>Techniques of Artificial Fertilization</p>	<p>Interactive Lecture</p>	<p>MCQs Viva</p>	<p>1</p>
<p>Learning outcome: Describe the histology of basic tissues (epithelium, connective & muscular tissue) of human body.</p>					
<p>Describe the organization of cells in the epithelium and other basic tissues of body</p>	<p>Anatomy Histology</p>	<p>Simple Epithelium: (Types, Location, Functions)</p>	<p>Interactive Lecture</p>	<p>MCQs/ ATP/ Unobserved station with models/ Viva</p>	<p>1</p>
		<p>Stratified Epithelium (Types, Location, Functions) All epithelia</p>	<p>Interactive Lecture Practical</p>		<p>1</p>
		<p>Exocrine glands</p>	<p>Interactive Lecture Practical</p>		<p>1.5</p>
		<p>Connective tissue1: components</p>	<p>Interactive Lecture</p>		<p>1 1.5</p>
		<p>Connective tissue2: classification description of each type</p>	<p>Interactive Lecture Practical</p>		<p>1</p>
		<p>Muscular Tissue</p>	<p>Interactive Lecture Practical</p>		<p>1 1.5</p>
		<p>Learning Outcome: Define various terms of position and movement to understand anatomy of human body</p>			
<p>Identify the exact location of a dissected/ prosected part /organ of human body with respect to various terms of position</p>	<p>Anatomy Gross</p>	<p>Terminologies: Anatomical positions, Terms of positions, Anatomical planes</p>	<p>Demonstration (SGD)</p>	<p>MCQs Viva</p>	<p>1.5</p>
<p>Discuss the anatomical terms for body movements</p>		<p>Terms of movement</p>	<p>Demonstration (SGD)</p>	<p>Quiz MCQs</p>	<p>1</p>
<p>Learning Outcome: Describe the function of support, protection, transportation and defense with the knowledge of musculoskeletal, integumentary, circulatory, and lymphatic systems respectively</p>					

<p>Discuss the function of support and protection by using the general knowledge of skin, fascia and bones and their component tissues</p> <p>Discuss the multiple functions of skin (i.e., sensory organ, immunological barrier, synthesis of vitamin D, etc)</p>	Anatomy Gross	Skeletal System (Division and Function): Classification of Bones	Demonstration (SGD)	Quiz	1.5
		Gross structure of adult and parts of young long bone Blood supply of long bone	Demonstration (SGD)	MCQs/ Spotting	1.5
		Bone development (ossification): Blood supply of long bone, Cartilage	Demonstration (SGD)		1.5
		Bone	Museum Study		1.5
		Integumentary system Parts, function, appendages + fascia	Demonstration (SGD)		1.5
		Integumentary system Histology	Practical		1.5
	Physiology	Functions of skin	Interactive Lecture		1
<p>Discuss the association of movement and posture of human body by relating with the structure of muscles and joints</p>	Anatomy Gross	General concepts of muscles	Demonstration (SGD)	Quiz MCQs Viva	1.5
		General concepts of joints	Demonstration (SGD)	Quiz MCQs Viva	1.5
	Muscle and Joints	Museum study	Spotting	1.5	

Describe the transport system for blood and lymph in the body		<ul style="list-style-type: none"> General concepts of blood vessels Introduction to Lymphatic system 	Demonstration (SGD)	Quiz MCQs Viva	1.5
			Demonstration (SGD)		1.5
Differentiate among the blood components of RBCs, WBCs, & Platelets with emphasis on WBC basic function	Physiology	Composition and function of blood	Interactive Lecture	MCQS Viva	1
		Function of WBCs	Interactive Lecture	MCQS Viva	1
Learning Outcome: Describe the regulatory mechanisms of the human body by the knowledge the of nervous system					
Classify nervous system Identify parts and types of neurons Discuss the general concepts of nervous system and including Autonomic Nervous system Identify parts of a nerve and typical spinal nerve Discuss basic and applied physiology of autonomic nervous system	Anatomy Gross	<ul style="list-style-type: none"> Nervous System Division: CNS and PNS Neurons: Types Classification Nerve (With Its covering) & Myelin sheath 	Interactive Lectures	Quiz MCQs Viva Spotting	1
		<ul style="list-style-type: none"> Typical Spinal Nerve Autonomic Nervous system sympathetic Autonomic Nervous system Parasympathetic 			1.5
	Physiology	Basic physiology of neurons	Interactive lecture	MCQs Viva	1

		Autonomic nervous system, sympathetic nervous system.	Interactive lecture	MCQs Quiz Viva	1
		Autonomic nervous system Parasympathetic nervous system	Interactive lecture	MCQs Quiz Viva	1
Discuss the role of minerals in nerve conduction and membrane potential	Biochemistry	<ul style="list-style-type: none"> Minerals: Calcium, Phosphate, Sodium, Chloride, Potassium, Iron, Iodine , Zinc 	Interactive Lecture	MCQs	1
Learning Outcome: Recognize morphologic alterations in cell injury & cell death.					
Discuss the pathological aspects of cell Describe the different mechanisms associated with morphological spectrum of injury at simple and electron microscopic levels.	Pathology	<ul style="list-style-type: none"> Introduction of Pathology & cellular response to stress and injury Introduction to Pathology lab 	Interactive lecture	MCQs/OSPE/ Structured viva	1
			Practical	OSPE	1.5
		<ul style="list-style-type: none"> Cell Injury and Cell death -1 	Interactive lecture	MCQs/OSPE/ Structured viva	1
		<ul style="list-style-type: none"> Cell injury and Cell death 2 	Interactive lecture	MCQs/OSPE/S tructured viva	1
Explain the salient features of normal and abnormal cell division.	Pathology	<ul style="list-style-type: none"> Types of Adaptations of Cellular Growth & Differentiation 	Lecture	MCQs/OSPE/S tructured viva	1
		<ul style="list-style-type: none"> Apoptosis 	Lecture		1
		<ul style="list-style-type: none"> Mechanism of cell injury 	Practical	1.5	
		<ul style="list-style-type: none"> Intracellular accumulations Adaptations of cellular growth and differentiation 	Interactive lecture	1	
			Interactive lecture	MCQs/OSPE/S tructured viva	1

			Practical		1.5
<p>• Learning Outcome: Describe the basic structure, classification, and clinical importance of major bacterial pathogens</p>					
Differentiate a bacterial cell from a human cell to develop an understanding of the medically important structures and processes	Pathology	<ul style="list-style-type: none"> • Classification of medically important Bacteria • Bacterial growth and an overview of culture media • Structure of Bacteria cell • Classification of Bacteria 	Interactive lecture	MCQs/OSPE/ Structured viva	1
Describe the structural components of bacterial cell and their clinical importance		<ul style="list-style-type: none"> • Normal Flora • Gram positive cocci • Gram negative cocci • Gram positive rods 	Practical		1.5
Describe genetic features and variation in bacteria.		<ul style="list-style-type: none"> • Pathogenesis and Mechanisms of Bacterial infections 	Interactive Lecture Practical		1 1.5
Describe the basics of Gram straining.			Interactive Lecture Interactive Lecture Interactive Lecture Interactive Lecture		1 1 1 1
Identify bacteria according to their shapes		<ul style="list-style-type: none"> • Bacterial Growth and Culture Media 	Interactive Lecture + Practical		1+1.5
Enlist commonly used bacterial culture media, their uses and methodology of bacterial cultur			Practical		1.5

Learning Outcome: Describe the basic structure, classification, and clinical importance of viral pathogens.					
Describe the basic structure and classification of medically important viruses Explain the genetic structure of viruses and how they are used in gene therapy. Explain the working of major viral vaccines	Pathology	Virus: Structure and Replication	Interactive Lecture	MCQs/OSPE/Structured Viva	1
		Classification of Medically important Viruses	Interactive Lecture	MCQs/OSPE/Structured Viva	1
Learning Outcome: Explain the human genetic architecture, and basics of genetic human diseases					
Describe the basic human genetic architecture. Explain the role of mutations and mutagens Enlist the features of major genetic disorders	Pathology	Human genetic architecture	Interactive lecture	MCQs/OSPE/Structured Viva	1
		Chromosomal Disorders	Interactive lecture	MCQs/OSPE/Structured Viva	1
Apply the basic concepts of Chemistry of Nucleic acids and their types for understanding the mechanism of transfer of genetic characters and for protein synthesis	Biochemistry	<ul style="list-style-type: none"> Nucleic Acids: Structure and Functions 	Interactive Lecture	MCQs/Viva	1
		<ul style="list-style-type: none"> Introduction to central dogma 	Interactive Lecture	MCQs/Viva	1
Learning outcome: Interpret the biochemistry of carbohydrates, proteins and fats					
		<ul style="list-style-type: none"> Carbohydrates structure and function Carbohydrate: 			

Classify carbohydrates on the basis of structure, function and chemical reactions and recognize their importance in living systems	Biochemistry	<ul style="list-style-type: none"> Monosaccharides and derivatives, isomerism Carbohydrates: Disaccharides, Oligosaccharides, polysaccharides 	Interactive Lecture	MCQs/Viva	3
		<ul style="list-style-type: none"> Biomedical importance of carbohydrates 	Tutorial	MCQs/Viva/OSPE	1.5
		<ul style="list-style-type: none"> Demonstrate the scheme of CHO detection Detection of CHO 	Practical	OSPE	3
Classify protein on the basis of structure, function and chemical reactions and recognize their importance in living systems		<ul style="list-style-type: none"> Amino Acids: Structure, Classification and Functions. Proteins: Classification and Functions Protein Structure: Levels of organization Water soluble vitamins 	Interactive Lecture	MCQs/ Viva	4
		<ul style="list-style-type: none"> Biomedical importance of protein 	Tutorial	MCQs Viva	1.5
		<ul style="list-style-type: none"> Demonstrate the scheme of protein detection Detection of proteins in given sample 	Practical	OSCE	3
Classify lipids based on structure, function and chemical reactions and recognize their importance in living systems		<ul style="list-style-type: none"> Fatty acids: Structure, Classification and Functions Lipids: Structure Classification and Functions Fat soluble vitamins 	Interactive Lecture	MCQs/Viva	3
		<ul style="list-style-type: none"> Biomedical 		MCQs	

		importance of lipids	Tutorial	Viva OSPE	1.5
		<ul style="list-style-type: none"> Solubility and emulsification of fats 	Practical	OSPE	1.5
Learning outcome: Apply the understanding of population health issues to the health needs of individuals, families and communities.					
Evaluate the significance of community medicine in preservation and promotion of community health	Community Medicine	<ul style="list-style-type: none"> Introduction to Community Medicine/ Public Health 	Interactive Lecture	MCQs	1
		<ul style="list-style-type: none"> Concept of Health and Disease 	Interactive Lecture	MCQs	1
Introduction of the Health care system in Pakistan		<ul style="list-style-type: none"> Health System of Pakistan Health care delivery system of Pakistan The District Health System in the context of devolution 	Interactive Lecture Tutorial	MCQs	1 1 1.5
Apply the ethical standards of behavior and knowledge to professional practice		<ul style="list-style-type: none"> Introduction to Bioethics Definition of Major Principles of Bioethics Doctor Patient relationship Truth telling Privacy and Confidentially, Informed consent 	Interactive Lecture Tutorial Tutorial Tutorial	MCQs OSCE/MCQs OSCE/MCQs OSCE/MCQs	1 1.5 1.5 1.5
Discuss the leadership in healthcare system		<ul style="list-style-type: none"> Leadership in Health care Primary Health care Health promotion and Health education 	Interactive Lecture Interactive Lecture Interactive Lecture	MCQs MCQs MCQs	1 1 1

Learning Outcome: Recognize the importance of behavioral sciences.					
Define behavioral sciences ,its principles and its role in medical sciences	Behavioral Sciences	<ul style="list-style-type: none"> • Introduction to behavioral science • Knowledge of culture, cultural influences, beliefs, values and norms in holistic care • Delivery of culturally relevant and culture sensitive practice. • Value, clarification and attitudinal transformation, sex/gender, stigma, discrimination. 	Interactive lectures/ Online lectures (Videos)	MCQs	
Learning Outcome: Provide appropriate first aid management for minor injuries.					
Assemble a First Aid Kit with at least twelve essential contents.	Undergraduate Skills	<ul style="list-style-type: none"> • Bandages • Cotton roll • Scissors • Torch • Antisepetic (Pyodine / Chlorhexidene) • Ointments • Safety pins • Splints • Adhesive tapes • Saniplast • Thermometer • Plasters 	Small group (Hands-on activity)	Formative assessment in sessions CQ (Summative)	1.5
Demonstrate appropriate communication skills while handling a patient requiring first aid. (especially reassurance to patient)		<ul style="list-style-type: none"> • Reassurance • Calming the patient 	Small group		
Administer first aid skills (bleeding & soft		<ul style="list-style-type: none"> • Bleeding: Demonstrate the appropriate methods of managing external bleeding. 			

<p>tissue injuries) Part 1</p>		<p>(Direct pressure, compressing pressure points, elevation).</p> <ul style="list-style-type: none"> • Soft Tissue Injuries: Demonstrate proper management of wounds including assessment, cleaning and dressing (head, forearm and hand, leg and ankle). 	<p>Small group (Hands-on activity)</p>		
<p>Administer first aid skills (burns, fractures and vertebral injury) Part 2</p>		<ul style="list-style-type: none"> • Vertebral column Injury: Demonstrate correct rolls, moves, and lifts in transporting a patient to avoid spinal cord injury (log roll, spine stabilization) • Bony Injuries (Fractures): • Demonstrate the correct method of splinting fractures in leg and arm. • Burns: Demonstrate the correct method of first aid management of burns. 			
<p>Identify and assess the cardiac arrest victim</p> <p>Demonstrate the correct techniques pulse recognition</p> <p>Demonstrate the correct technique of cardio-pulmonary resuscitation</p>	<p>CPR</p>	<p>Sudden Cardiac arrest</p> <p>Ventilation technique</p> <p>Defibrillation</p>	<p>Small group</p> <p>Video based Hands-on activity</p>	<p>Formative assessment</p> <p>MCQs</p>	<p>1.5</p>

Case Based Learning:

No.	CBL Topic	CBL Objectives
CBL 1	Fluid and Electrolyte balance	Define Osmosis and how hypernatremia disturbs the osmolarity and cellular function Enumerate the Factors affecting the movement of water and electrolytes across cell membrane (Between extracellular and intracellular compartment) Enumerate the causes of Hypervolemia Hypernatremia , Isovolumic Hypernatremia and Hypovolemic Hypernatremia How homeostasis is achieved if water and electrolytes are disturbed
CBL 2	Menstrual cycle	Explain the normal menstrual cycle Name the phases of menstrual cycle. Describe the role of hormones in menstrual cycle (their regulation and effects) Discuss the histological changes in ovary and endometrium. Classify the types of menstrual cycle abnormalities
CBL 3	Cell structure and chromosomal abnormalities	Discuss the structure, function and different parts of cell. Explain the importance of cell membrane in regulating various function and defects in disease states. Describe the importance of nucleus in defining cell function and determining phenotype and genotype of the species. Discuss the structure, number and types of chromosomes. Explain the effects of Chromosomal anomalies on gross appearance and physiological functions of human body Describe the clinical features of this syndrome and name it. Discuss the social and ethical issues associated with this syndrome. Name other syndromes of numerical and structural chromosomal abnormalities.
CBL 4	Twin pregnancy	Define Twin pregnancy. Classify the twin pregnancy on the basis of fetal membranes. Describe the predisposing factor leading to twin pregnancy Explain the types and complications of twin pregnancy.

Study Skills

S.No	Topics	Learning Objectives	Teaching/ Learning Strategy
1.	Learning Styles	a. Identify their individual learning styles b. Apply effective learning strategies to improve their learning	Interactive lecture/ Small group discussion
2	Time Management Skills	a. Identify various strategies for reducing time wasters b. Recognize the variety of procrastination c. Apply relevant technique to overcome procrastination d. Create more planning time for achieving priority goals timely	
3	Stress Management	a. Map the course and effect of stress on oneself b. Assess their own stress levels c. Recognize stress management technique	
4	Assessment Skills	a. Demonstrate appropriate exam preparation skill b. Analyze exam taking strategies of academic high achievers c. Develop repertoire of effective study habits d. Distinguish between effective and ineffective study habits e. Apply strategies to improve reading skills. f. Improve note taking skills during lectures and visual aids	
5	Reflective Practice	a. Discuss the benefits of reflection & its place in academic study b. Use reflection to improve their learning	

The contents are subjected to be altered according to requirement of academic calendar

Learning Resources

S. No	Subject	Readings
1	ANATOMY	<ul style="list-style-type: none"> • Moore KL, Dalley AF. Clinically oriented anatomy. South Asia ed. India. Wolters Kluwer; 2018 Jul 12. • Drake R, Vogl AW, Mitchell AW, Tibbitts R, Richardson P. Gray's Atlas of Anatomy E-Book. Elsevier Health Sciences; 2020 Feb 27. • CLINICAL ANATOMY BY REGIONS (REFERENCE BOOK) Richard S. SNELL 9th EDITION • LAST'S ANATOMY: REGIONAL & APPLIED (REFERENCE BOOK) Chummy S. Sinnatamby 12th or Latest EDITION • ATLAS OF HUMAN ANATOMY FRANK H NETTER 6th EDITION
2	EMBRYOLOGY	<ul style="list-style-type: none"> • LANGMAN'S MEDICAL EMBRYOLOGY T.W. SADLER 13th EDITION • THE DEVELOPING HUMAN CLINICALLY ORIENTED EMBRYOLOGY (REFERENCE BOOK) MOORE & PERSAUD & TORCHIA 10th EDITION
3	HISTOLOGY	<ul style="list-style-type: none"> • MEDICAL HISTOLOGY LAIQ HUSSAIN SIDDIQUI 5TH or Latest EDITION • WHEATERS FUNCTIONAL HISTOLOGY BARBARA YOUNG 5th EDITION • BASIC HISTOLOGY(TEXT AND ATLAS) (REFERENCE BOOK) LUIZ JUNQUEIRA, JOSE CARNEIRO Latest EDITION
4	PHYSIOLOGY	<ul style="list-style-type: none"> • GUYTON AND HALL TEXTBOOK OF MEDICAL PHYSIOLOGY GUYTON AND HALL 13th EDITION
5	BIOCHEMISTRY	<ul style="list-style-type: none"> • LIPPINCOTT'S ILLUSTRATED REVIEWS SERIES 6th EDITION By Ph.D. Ferrier, Denise R. • HARPER'S ILLUSTRATED BIOCHEMISTRY THIRTY-FIRST EDITION 31ST EDITION by Victor Rodwell, David Bender, Kathleen Botham Peter Kennelly, P. Anthony Weil
6	COMMUNITY MEDICINE	<ul style="list-style-type: none"> • PUBLIC HEALTH AND COMMUNITY MEDICINE SHAH, ILYAS, ANSARI 7th EDITION

7	PATHOLOGY	<ul style="list-style-type: none">• ROBBINS BASIC PATHOLOGY KUMAR &ABBAS 9TH EDITION• ROBBINS & COTRAN PATHOLOGIC BASIS OF DISEASE (REFERENCE BOOK) KUMAR & ABBAS & ASTER 9th EDITION
8	MICROBIOLOGY	<ul style="list-style-type: none">• REVIEW OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY WARREN LEWINSON 14th EDITION
9	PHARMACOLOGY	<ul style="list-style-type: none">• LIPPINCOTT'S ILLUSTRATED REVIEW PHARMACOLOGY KAREN WHALEN 6th or Latest Edition• BASIC AND CLINICAL PHARMACOLOGY (REFERENCE BOOK) BERTRAM G. KATZUNG 11th EDITION
10	BEHAVIORAL SCIENCES	<ul style="list-style-type: none">• HANDBOOK OF BEHAVIORAL SCIENCES 3RD EDITION (MOWADAT H RANA, ROOP Z RANA, MANSOOR MUSTAFA)• BEHAVIORAL SCIENCES (DR MOWADAT RANA) 2ND EDITION (available on PDF)

ASSESSMENT

Assessment will be done in two parts:

At end of module

- Module Exam (Theory) -20%
- Module Exam Practical Internal Evaluation- 20%

At the end of Year

- Annual Exam (Theory) -80%
- Annual Exam (OSPE, Viva)-80%

MCQs (Multiple choice questions), OSPE (Objective Structured Practical Exam) and structured viva will be the main assessment tool.