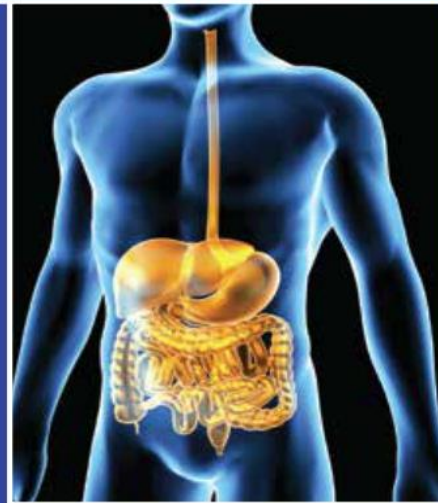


# STUDY GUIDE

## Block - 4

GIT & NUTRITION - 1 & RENAL - 1 MODULE

2<sup>nd</sup> Year MBBS



Department of Medical Education  
Aziz Fatimah Medical & Dental College  
Faisalabad

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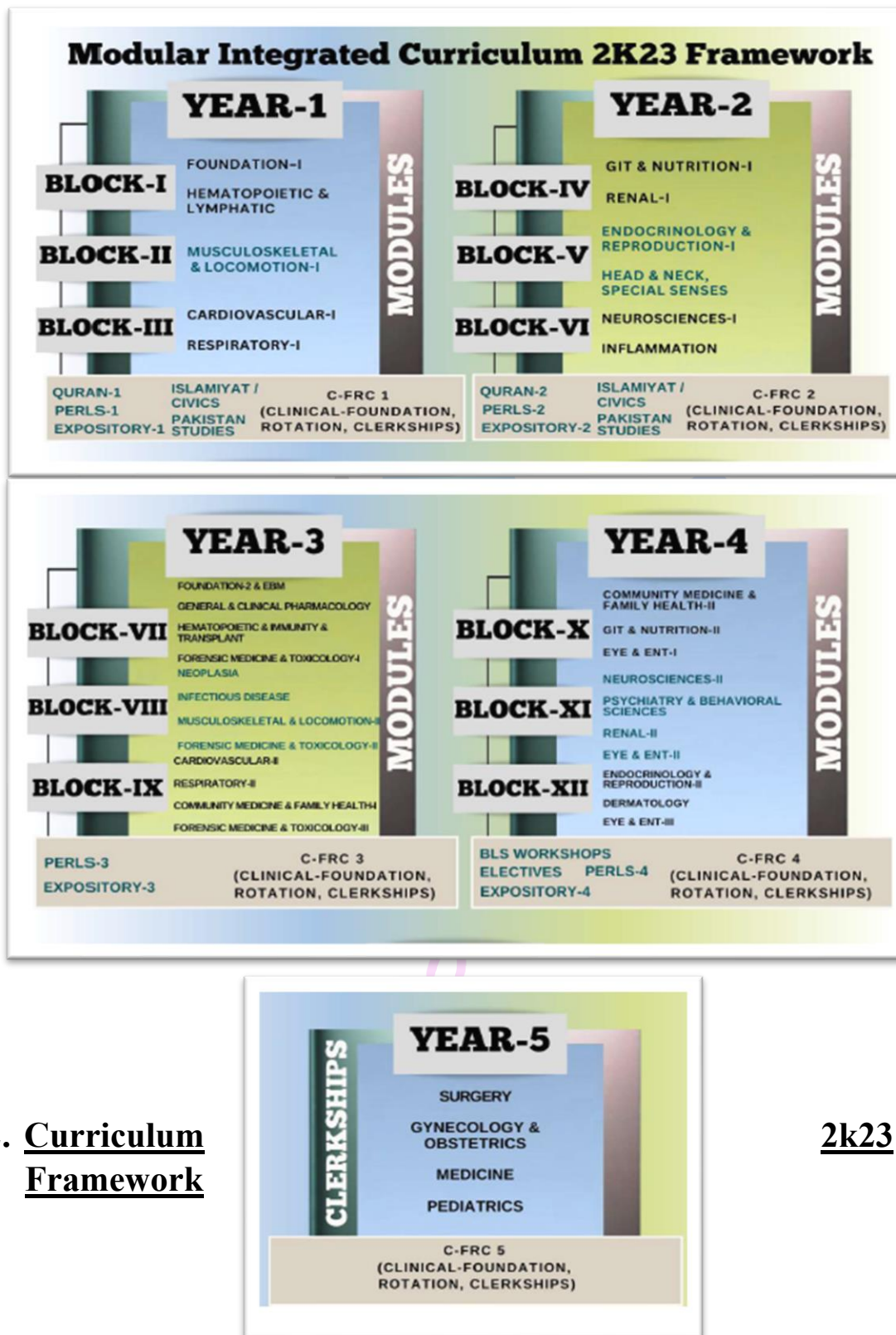
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## 1. List of Abbreviations

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
CO <sub>2</sub>	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 Framework

2k23

### **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.

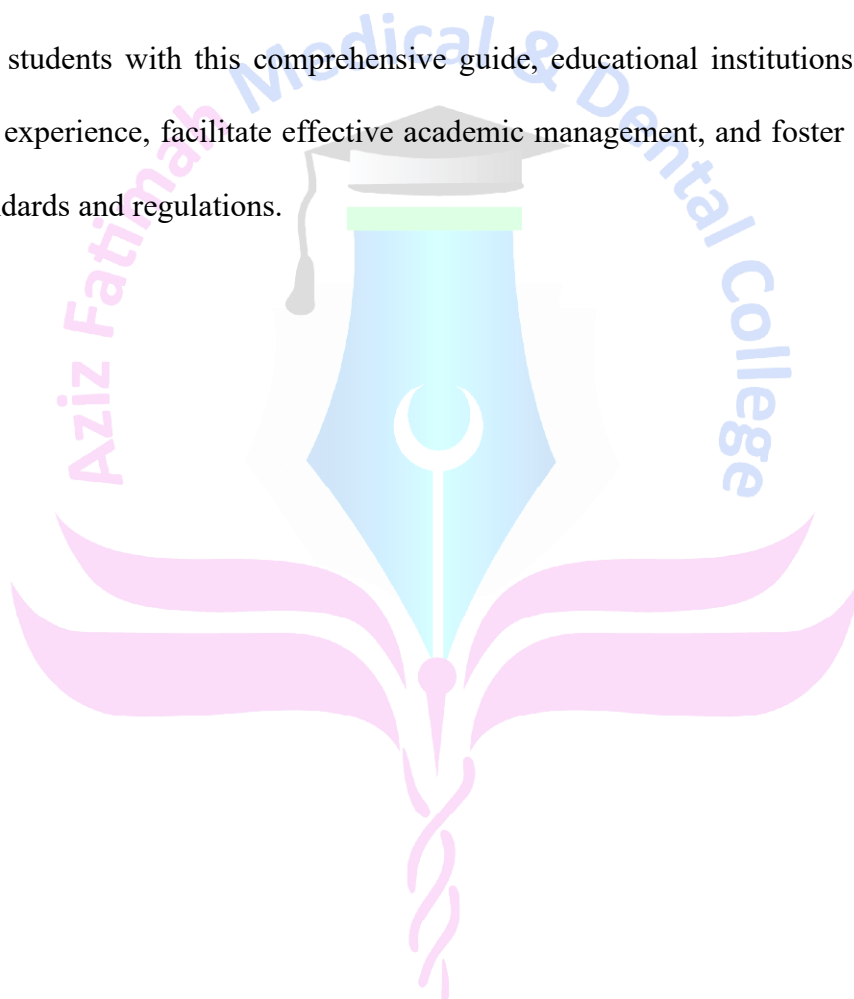
**6. Including information on assessment methods:**

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-4 Module Committee

BASIC HEALTH SCIENCES	CLINICAL SCIENCES
<b>Anatomy:</b> Prof. Dr. Quddus Ur Rehman	<b>Medicine:</b> Prof. Dr. Ghulam Abbas Sheikh
<b>Physiology:</b> Prof. Dr. Qamar Mehboob	<b>Surgery:</b> Prof. Dr. Asrar
<b>Biochemistry:</b> Prof. Dr. Shahzad	<b>Radiology:</b> Asst. Prof. Dr. Shemona
<b>Community Medicine:</b> Prof. Dr. Humayun Suqrat	<b>Gynecology:</b> Prof. Dr. Nazia Musarrat
<b>Pathology:</b> Prof. Dr. Kashif Baig	
<b>Pharmacology:</b> Dr. Sarwat Jahan	
<b>Behavioral Sciences:</b> Dr. Yawar	
<b>Medical Education:</b> Dr. Ayesha Sadiq	
<b>Block Coordinator</b>	Prof. Dr. Qamar Mehboob
<b>Principal AFMDC</b>	<b>Prof. Dr. Ghulam Abbas Sheikh</b>

Amal Medical & Dental



# **GIT AND NUTRITION-1 MODULE**



## **5. Introduction of GIT and Nutrition-1 Module**

Welcome to the Gastrointestinal Tract (GIT) and Nutrition module, an essential component of your second-year MBBS curriculum. This module is designed to provide you with a comprehensive understanding of the structure, function, and disorders of the gastrointestinal system, as well as the fundamental principles of nutrition and their clinical implications.

The gastrointestinal tract, often referred to as the digestive system, plays a crucial role in the breakdown and absorption of nutrients essential for maintaining health and sustaining life. Through a series of intricate processes, beginning with ingestion and culminating in excretion, the GIT facilitates the digestion of food, absorption of nutrients, and elimination of waste products.

Throughout this module, you will delve into the anatomy and physiology of the GIT, exploring its various components such as the mouth, esophagus, stomach, small intestine, large intestine, and associated accessory organs including the liver, gallbladder, and pancreas. You will learn about the mechanisms underlying digestion, absorption, and motility, gaining insight into how the intricate interplay of physiological processes ensures efficient nutrient uptake and waste elimination.

In addition to understanding the normal functioning of the GIT, this module will also focus on the pathophysiology of gastrointestinal disorders.

Moreover, this module will emphasize the crucial role of nutrition in maintaining health and preventing disease. You will explore the principles of nutritional science, including macronutrients, micronutrients, dietary guidelines, and the impact of nutrition on overall health and well-being. Understanding the relationship between diet and disease will enable you to counsel patients on dietary modifications and lifestyle interventions to optimize health outcomes.

As future healthcare professionals, proficiency in understanding and managing gastrointestinal and nutritional disorders is paramount to your ability to provide comprehensive patient care. By mastering the content of this module, you will lay the foundation for your clinical practice and

develop the skills necessary to address the diverse needs of patients with gastrointestinal and nutritional concerns.

We encourage you to approach this module with enthusiasm and dedication, as the knowledge and skills you acquire will not only enhance your academic prowess but also empower you to make a meaningful difference in the lives of your future patients.



## 5.1. Module Rationale

Gastrointestinal system is an integral part of human body which is primarily related to consumption, digestion and assimilation of food to provide nutrition and calories on regular basis to human body which are essential for basic functioning of each organ of human beings.

We will study in detail regarding different parts of gastrointestinal system, their functional, embryological and histological anatomy, physiological and biochemical aspects of its functioning. Students will also be briefly introduced to clinical and pathological aspects, pharmacological interventions and preventive measures of common diseases related to the system.

We have assigned six (6) weeks in academic calendar of 2nd year curriculum of MBBS to Gastrointestinal Module. We have divided our module into eight (8) themes. For every theme, anatomy, physiology, biochemistry, pathology, pharmacology, community medicine, behavioral sciences, general medicine and surgery will need to plan for integrated teaching of students for better comprehension and understanding of subject. We have outlined learning outcomes for each discipline along with allocated time to be taught.

## 5.2. Module Outcomes

- To describe gross and microscopic anatomy of different parts of gastrointestinal system and associated organs
- To describe the embryological development of different parts of gastrointestinal system and associated organs
- To describe the functional anatomy and physiology of different parts of gastrointestinal system and associated organs
- To describe the motility, secretory and digestive function of gastrointestinal system
- To describe the biochemical aspects of carbohydrate metabolism
- To discuss pathological aspect and management of gastrointestinal related diseases
- To discuss the pharmacological treatment of diarrhea
- To discuss the psychosocial impact of gastrointestinal diseases in society
- To discuss the preventive measures related to gastrointestinal diseases
- To comprehend concept of balanced diet and malnutrition

### 5.3. Learning Objectives

#### 5.3.1. Knowledge

##### ➤ Anatomy

Topic	Sub Topic	Learning objectives
Gross Anatomy	Oral Cavity and Oropharynx	<ul style="list-style-type: none"> <li>• Describe the gross anatomical features of oral cavity with its neurovascular supply and lymphatic drainage</li> <li>• Discuss the location, anatomical features, relations and vascular supply of tonsils: nasopharyngeal, palatine and lingual.</li> <li>• Discuss the skeletal framework of hard palate with its neurovascular supply and lymphatic drainage</li> <li>• Describe the gross anatomical features of soft palate with its neurovascular supply and lymphatic drainage</li> <li>• Describe the attachments, nerve supply and actions of muscles of soft palate</li> <li>• Describe the structure of tongue with attachments of muscles, blood supply, nerve supply and lymphatic drainage</li> <li>• Discuss the anatomical basis of injury to hypoglossal nerve</li> <li>• Describe anatomical features, relations and neurovascular supply of parotid gland and its duct, mentioning the structures entering and exiting the gland.</li> <li>• Discuss the clinical correlates of parotid gland: parotiditis, Mumps, Frey's syndrome, parotid duct injury and parotid tumor surgery with its complications.</li> <li>• Describe the Waldeyer's ring.</li> <li>• Describe anatomical features, relations and neurovascular supply of submandibular and sublingual glands with their ducts.</li> <li>• Name the parts of pharynx giving their extent, anatomical features, structure, neurovascular</li> </ul>

		<p>supply and Lymphatic drainage</p> <ul style="list-style-type: none"> <li>Name the pharyngeal constrictor muscles defining their attachments, innervation and structure traversing the gaps between adjacent muscles.</li> </ul>
	<p>Anterior Abdomen Wall</p>	<ul style="list-style-type: none"> <li>Describe the planes and quadrants of abdomen</li> <li>Draw and label the cutaneous innervation and dermatomes of anterior abdominal wall and anterolateral Abdominal wall and describe the clinical correlates (Abdominal pain, Muscle rigidity, Referred pain, anterior abdominal nerve block)</li> <li>Describe the fascia of anterior abdominal wall with its clinical significance</li> <li>Describe anterolateral Abdominal wall arteries, Veins and Lymphatic and related clinical correlates—Caput Medusae</li> <li>Describe the attachments, nerve supply and actions of muscles of anterior abdominal wall</li> <li>Identify the muscles of anterolateral abdominal wall on anatomical model and/or cadaver</li> <li>Describe the extent, formation and contents of rectus sheath</li> <li>Give the formation and extent of inguinal ligament</li> <li>Describe the formation of superficial and deep inguinal rings and conjoint tendon</li> <li>Locate the position of superficial and deep inguinal rings on simulated subject or Cadaver</li> <li>Describe the extent, boundaries and contents of inguinal canal</li> <li>Define the following hernias:umbilical, epigastric,incisional, Spigelian, lumbar, femoral, internal and inguinal</li> <li>Differentiate between direct and indirect inguinal hernias</li> <li>Describe the location of abdominal surgical incisions</li> <li>Mark the abdominal incisions on simulated patient/subject and explain their anatomical basis</li> <li>List the structures and coverings of spermatic</li> </ul>

		cord
	Peritoneum	<ul style="list-style-type: none"> <li>Trace the horizontal and vertical peritoneal reflections</li> <li>Describe the relationship of viscera to the peritoneum</li> <li>Describe the gross anatomical features of the following: Mesentery Omentum Peritoneal ligaments Peritoneal fold Peritoneal sac, Recesses, Spaces and Gutters</li> <li>Describe the nerve supply of Peritoneum</li> <li>Describe the anatomical basis and manifestations of the following: Peritonitis and ascites Peritoneal adhesions (and adhesiostomy) Abdominal paracentesis</li> </ul>
	Esophagus	<ul style="list-style-type: none"> <li>Describe the extent of esophagus, its constrictions, neurovascular supply and lymphatic drainage</li> <li>Discuss the anatomical basis of esophageal varices, achalasia and Gastro Esophageal Reflux Disease (GERD)</li> </ul>
	Stomach	<ul style="list-style-type: none"> <li>Describe the location, position, parts, external and internal structure, relations, vascular and nerve supply and lymphatic drainage of stomach</li> <li>Draw and label a diagram illustrating the lymphatic drainage of Stomach</li> <li>Describe the clinical presentation and the anatomical basis and manifestations of the following conditions: Carcinoma of stomach and peptic ulcers</li> <li>Identify and demonstrate the parts, external and internal features of stomach on anatomical model and cadaver</li> </ul>
	Small & Large	<ul style="list-style-type: none"> <li>Describe the location, position, parts, relations, neurovascular supply and lymphatic drainage of duodenum</li> <li>Describe the anatomical basis and manifestations of the following conditions:</li> </ul>

	Intestine	<p>Duodenal Ulcers Ileal diverticulum Diverticulosis Large bowel cancer Appendicitis Volvulus Intussusception</p> <ul style="list-style-type: none"> <li>• Demonstrate the various positions of appendix</li> <li>• Identify and demonstrate the Parts and external features of small and large intestines on anatomical model and cadaver</li> </ul>
	Liver	<ul style="list-style-type: none"> <li>• Describe the origin, course, branches (tributaries in case of veins) and distribution of the blood vessels of GIT</li> <li>• Describe the formation, tributaries and drainage of hepatic-portal vein</li> <li>• Discuss the sites and vessels contributing in portosystemic anastomosis</li> <li>• Describe the clinical picture and anatomical basis for the blockage of porto-systemic anastomosis</li> <li>• Identify the blood vessels supplying GIT on anatomical model and cadaver</li> <li>• Describe location, lobes, important relations, peritoneal ligaments, blood supply lymphatic drainage, nerve. Supply, related clinical correlates of liver and subphrenic spaces.</li> </ul>
	Biliary System	<ul style="list-style-type: none"> <li>• Describe components of Biliary tree- hepatic duct and bile duct</li> <li>• Describe relations, functions, blood supply, lymphatic drainage and nerve supply of Gallbladder</li> <li>• Describe related clinical correlates- gall stones, biliary colic, cholecystectomy, gallbladder gangrene</li> </ul>
	Pancreas	<ul style="list-style-type: none"> <li>• Describe the location, surfaces, peritoneal reflections, relations, neurovascular supply and lymphatic drainage of pancreas</li> <li>• Describe the anatomical basis and manifestations of pancreatitis and pancreatic cancer</li> <li>• Identify the parts of the pancreas</li> </ul>
		<ul style="list-style-type: none"> <li>• Describe the location, surfaces, peritoneal reflections, relations, neurovascular supply</li> </ul>

	Spleen	<p>and lymphatic drainage of spleen</p> <ul style="list-style-type: none"> <li>• Describe the anatomical basis and manifestations of splenic trauma and splenomegaly</li> <li>• Identify the borders, surfaces and Impressions of spleen</li> <li>• Demonstrate the correct anatomical positioning of spleen.</li> </ul>
	Sigmoid Colon, Rectum & Anal Canal	<ul style="list-style-type: none"> <li>• Describe the gross anatomical features, peritoneal relations, blood supply, nerve supply and lymphatic drainage of sigmoid colon, rectum and anal canal.</li> <li>• Describe the anatomical basis for Sigmoidoscopy, rectal prolapse, rectal examination, rectal cancer and hemorrhoids</li> </ul>
	Surgical Intervention	<ul style="list-style-type: none"> <li>• Outline the anatomical basis and surgical treatment plan for the following diseases: Esophageal Injuries Gastric Carcinoma Intestinal Obstruction Pancreatic Carcinoma Obstructive Jaundice Gall Stones</li> </ul>
	Posterior Abdomen Wall	<ul style="list-style-type: none"> <li>• Describe the fascia of posterior abdominal wall with its clinical significance</li> <li>• Describe anterolateral Abdominal wall arteries, Veins and Lymphatics and related clinical correlates</li> <li>• Describe the attachments, nerve supply and actions of muscles of posterior abdominal wall</li> </ul>
<b>Embryology &amp; Post-Natal Development</b>	Oral Cavity	<ul style="list-style-type: none"> <li>• Describe the development of tongue</li> <li>• Describe the embryological basis of tongue tie</li> <li>• Describe the development of palate</li> <li>• Describe the embryological basis of various facial clefts</li> <li>• Identify the parts of the developing tongue and palate</li> </ul>
	Foregut	<ul style="list-style-type: none"> <li>• Describe the formation and divisions of gut tube</li> <li>• Describe the development of mesenteries</li> <li>• Describe the development of esophagus</li> <li>• Describe the embryological basis of esophageal atresia and/or tracheoesophageal</li> </ul>

		<p>fistula</p> <ul style="list-style-type: none"> <li>• Describe the development and rotation of stomach</li> <li>• Describe the embryological basis of pyloric stenosis</li> <li>• Describe the development of duodenum, liver and gall bladder</li> <li>• Describe the embryological basis of intrahepatic and extrahepatic biliary atresia</li> <li>• Describe the development of pancreas</li> <li>• Describe the embryological basis of annular pancreas</li> </ul>
	Midgut	<ul style="list-style-type: none"> <li>• Describe the development of midgut especially mentioning physiological herniation, rotation, retraction of herniated loops and mesenteries of the intestinal loops</li> <li>• Describe the embryological basis of the following <ul style="list-style-type: none"> <li>mobile cecum</li> <li>volvulus</li> <li>retro colic hernia</li> <li>Omphalocele</li> <li>gastroschisis</li> </ul> </li> </ul>
	Hindgut	<ul style="list-style-type: none"> <li>• Describe the embryological basis of Meckel's diverticulum</li> <li>• Describe the embryological basis of; <ul style="list-style-type: none"> <li>Gut rotation defects</li> <li>Gut atresia and stenosis</li> </ul> </li> <li>• Describe the development of hindgut</li> <li>• Describe the embryological basis of; <ul style="list-style-type: none"> <li>Rectourethral and rectovaginal fistulas</li> <li>Recto anal fistulas and atresia</li> <li>Imperforate anus</li> <li>Congenital megacolon</li> </ul> </li> <li>• Identify the parts of the developing foregut, midgut and hindgut originating from the endoderm</li> </ul>
<b>Microscopic Anatomy (Histology &amp;</b>	Oral Cavity & Esophagus	<ul style="list-style-type: none"> <li>• Describe the light microscopic structure of; <ul style="list-style-type: none"> <li>Lips</li> <li>Tongue including lingual papillae and taste buds</li> <li>Oral Cavity (Cheeks, Teeth gums, hard &amp; Soft palate)</li> </ul> </li> <li>• Describe the histological structure of parotid, submandibular and sublingual glands.</li> </ul>

<b>Pathology)</b>		<ul style="list-style-type: none"> <li>• Compare and contrast the histological structures of parotid, submandibular and sublingual glands.</li> <li>• Describe the serous and mucous acini and give histological differences between the two.</li> <li>• Describe the structure and location of serous demilunes.</li> <li>• Describe histology of oropharynx</li> <li>• Relate the characteristics of various layers of GIT with their function</li> <li>• Describe the light microscopic structure of esophagus</li> <li>• Tabulate the histological differences between different parts of esophagus</li> <li>• Describe the histological changes associated with reflux esophagitis and Barrett's esophagus</li> </ul>
	Stomach	<ul style="list-style-type: none"> <li>• Describe the light microscopic structure of stomach</li> <li>• Describe the role of parietal cells in pernicious anemia</li> </ul>
	Small Intestine	<ul style="list-style-type: none"> <li>• Describe the light microscopic structure of Duodenum Jejunum Ileum</li> <li>• Discuss the histological basis of celiac disease</li> <li>• Discuss the histological basis of Crohn's disease</li> </ul>
	Large Intestine	<ul style="list-style-type: none"> <li>• Describe the light microscopic structure of Colon Appendix Rectum</li> <li>• Define colorectal cancer, anal abscess, hemorrhoids</li> </ul>

➤ **Physiology**

Topic	Sub Topic	Learning objectives
<p><b>Medical Physiology</b></p>	<p>General Principles of GIT Function - Motility, Nervous Control &amp; Blood Flow</p>	<ul style="list-style-type: none"> <li>• Classify the components of enteric nervous system</li> <li>• Discuss the location and significance of myenteric plexus</li> <li>• Describe the Meissner's plexus</li> <li>• Differentiate between myenteric and Meissner's plexuses</li> <li>• Explain the mechanism of developing slow wave</li> <li>• Explain the mechanism of developing spike potential</li> <li>• Enlist the factors that depolarize &amp; hyperpolarize the GIT membrane</li> <li>• Enlist the excitatory &amp; inhibitory neurotransmitters of enteric nervous system</li> <li>• Explain the role of sympathetic &amp; parasympathetic nervous system in controlling GIT function.</li> <li>• Enlist the gastrointestinal reflexes &amp; explain the functions of these reflexes</li> <li>• Enlist the hormones acting on GIT, their stimuli, site of release and actions</li> <li>• Enumerate different types of movements that occur in GIT</li> <li>• Discuss the functions and control of GIT movements</li> <li>• Discuss the effect of gut activity and metabolic factors on GIT blood flow</li> <li>• Explain the nervous control of GIT blood flow</li> </ul>
		<ul style="list-style-type: none"> <li>• Trace the reflex arc of mastication</li> <li>• Explain the process and importance of chewing reflex</li> <li>• Enlist the stages of swallowing</li> </ul>

	Oral Cavity & Esophagus	<ul style="list-style-type: none"> <li>• Describe the mechanism of voluntary stage of swallowing</li> <li>• Trace the reflex arc of involuntary stage of swallowing</li> <li>• Enlist the steps involved in involuntary stage of swallowing</li> <li>• Explain the effect of swallowing on respiration</li> <li>• Discuss the mechanism of esophageal stage of swallowing</li> <li>• Enlist causes of dysphagia</li> <li>• Explain the types and role of different peristalsis originating in esophagus</li> <li>• Discuss the role of Lower Esophageal Sphincter (Gastroesophageal)</li> <li>• Discuss the pathophysiology of achalasia &amp; Megaesophagus</li> <li>• Enlist the features and treatment of achalasia</li> </ul>
	Stomach	<ul style="list-style-type: none"> <li>• Explain storage function of stomach</li> <li>• Describe the basic electrical rhythm of stomach wall</li> <li>• Explain the role of pyloric pump and pyloric sphincter in gastric emptying</li> <li>• Explain the factors that promote Stomach Emptying</li> <li>• Discuss the duodenal (nervous &amp; hormonal) factors that inhibit Stomach emptying</li> <li>• Enlist the factors that initiate enterogastric inhibitory reflexes</li> <li>• Enumerate the causes, features, and pathophysiology of gastritis</li> <li>• Explain the physiological basis of each feature of gastritis</li> <li>• Recommend treatment of gastritis</li> <li>• Enumerate the causes, features, and pathophysiology of peptic ulcer</li> <li>• Explain the physiological basis of each feature of peptic ulcer</li> </ul>
	Small Intestine	<ul style="list-style-type: none"> <li>• Enumerate and explain the hormones and movements of small intestine</li> <li>• Explain the term “peristaltic rush”</li> <li>• Explain the functions of ileocecal valve and sphincter</li> <li>• Enumerate the types of intestinal sprue</li> <li>• Enlist the features of intestinal sprue</li> </ul>

		<ul style="list-style-type: none"> <li>• Explain the consequences of sprue on the body</li> </ul>
	Large Intestine	<ul style="list-style-type: none"> <li>• Enumerate the types of movements taking place in colon</li> <li>• Explain the mechanism of developing movements of colon and their control through Gastrocolic and Duodenocolic Reflexes</li> <li>• Enlist the defecation reflexes</li> <li>• Explain the mechanism of defecation reflex</li> <li>• Trace the reflex arc of defecation</li> <li>• Name the other autonomic reflexes that affect bowel activity</li> <li>• Explain the pathophysiology of constipation</li> <li>• Discuss the causes of diarrhea</li> <li>• Describe the cause of Hirschsprung's disease integrate with Medicine</li> </ul>
	Liver	<ul style="list-style-type: none"> <li>• Explain the functions of liver</li> <li>• Differentiate between liver and gall bladder bile and the hormones acting on them</li> <li>• Enumerate the causes and composition of developing gall stones</li> </ul>
	Pancreas	<ul style="list-style-type: none"> <li>• Explain function and secretions of pancreas</li> <li>• Enlist the causes and pathophysiology of acute and chronic pancreatitis</li> <li>• Enumerate the features of acute pancreatitis and explain the physiological basis of each feature of pancreatitis</li> </ul>
	Vomiting Reflex	<ul style="list-style-type: none"> <li>• Describe the stages of vomiting act</li> <li>• Trace the reflex arc of vomiting</li> <li>• Explain the role of chemoreceptor trigger zone for initiation of vomiting by drugs or by motion sickness</li> </ul>
	Acute & Chronic Diarrhea	<ul style="list-style-type: none"> <li>• Define Acute Diarrhea</li> <li>• Define Chronic Diarrhea</li> <li>• Enlist various causes for acute and chronic diarrhea</li> </ul>

➤ **Medical Biochemistry**

Topic	Sub Topic	Learning objectives
<b>Medical Biochemistry</b>	Biochemistry of GIT /GIT secretions & digestion and absorption of dietary carbohydrates	<ul style="list-style-type: none"> <li>• Give the composition and importance of saliva and related clinical disorder (xerostomia)</li> <li>• Give the composition and importance of gastric juice with special reference to mechanism of HCl secretion and related clinical disorders (achlorhydria, gastric ulcer)</li> <li>• Give the composition and importance of pancreatic juice, bile and succus entericus and related clinical disorders (pancreatitis, cystic fibrosis, cholelithiasis).</li> <li>• Describe digestion and absorption of dietary carbohydrates along with inherited and acquired disorders (lactose intolerance, sucrase-isomaltase deficiency).</li> </ul>
	Carbohydrate metabolism/ Entry of glucose into cells	<ul style="list-style-type: none"> <li>• Elaborate key features of various transport systems for entry of glucose into cells.</li> </ul>
	Carbohydrate metabolism/ Hormonal control of BSL	<ul style="list-style-type: none"> <li>• Enlist the hormones that play important roles in regulating carbohydrate metabolism.</li> <li>• Elaborate the metabolic effects of these hormones.</li> <li>• Infer the consequences of deficiency and excess of these hormones</li> </ul>
	Carbohydrate metabolism/ Glycolysis	<ul style="list-style-type: none"> <li>• Describe the glycolytic pathway along with its regulation and significance.</li> <li>• Compare key features of aerobic and anaerobic glycolysis.</li> <li>• Calculate the number of ATP produced during aerobic and anaerobic glycolysis.</li> <li>• Explain hemolytic anemia in subjects with pyruvate kinase deficiency based on your biochemical knowledge.</li> <li>• Clearly differentiate between substrate level Phosphorylation and oxidative phosphorylation.</li> </ul>

Carbohydrate metabolism/ Metabolic fates of pyruvate	<ul style="list-style-type: none"> <li>• Discuss the metabolic fates of pyruvate.</li> <li>• Describe the transport of pyruvate from cytosol to mitochondria.</li> <li>• Elaborate the reaction catalyzed by pyruvate dehydrogenase complex (PDH) along with regulation and significance.</li> <li>• Enlist inherited and acquired causes of lactic acidosis and give biochemical explanation for lactic acidosis in each condition.</li> </ul>
Carbohydrate metabolism/ Kreb's Cycle	<ul style="list-style-type: none"> <li>• Describe the TCA cycle along with regulation &amp; significance. Calculate the energy yield of TCA</li> </ul>
Carbohydrate metabolism/ Gluconeogenesis	<ul style="list-style-type: none"> <li>• Define gluconeogenesis and enumerate gluconeogenic substrates (precursors)</li> <li>• Delineate the reactions involved in synthesis of glucose from various gluconeogenic substrates.</li> <li>• Elaborate the regulation and importance of gluconeogenesis.</li> <li>• Explain the significance of Cori cycle and glucosealanine cycle</li> </ul>
Carbohydrate metabolism/ Glycogen metabolism	<ul style="list-style-type: none"> <li>• Illustrate the reactions of glycogenesis, glycogenolysis along with their regulation and significance</li> <li>• Enlist various types of glycogen storage diseases (GSDs)</li> <li>• Infer the key biochemical and clinical features of various GSDs from the respective enzyme deficiencies.</li> </ul>
Carbohydrate metabolism/ HMP Hexose Monophosphate Pathway	<ul style="list-style-type: none"> <li>• Describe the reactions and regulation of Hexose Mono Phosphate Pathway (HMP).</li> <li>• Discuss the importance of HMP shunt</li> <li>• Explain hemolytic anemia in subjects suffering from G6PD deficiency.</li> <li>• Diagnose G6PD (glucose-6-phosphate dehydrogenase) deficiency based on given data.</li> </ul>
Carbohydrate metabolism/ Uronic acid pathway & sorbitol pathway	<ul style="list-style-type: none"> <li>• Describe the reactions, regulation, and biomedical importance of uronic acid pathway and sorbitol pathway</li> </ul>
Carbohydrate metabolism/ Ethanol metabolism	<ul style="list-style-type: none"> <li>• Outline the reactions involved in ethanol metabolism.</li> <li>• Explain how ethanol consumption causes hypoglycemia and fatty liver.</li> </ul>

	Respiratory chain & oxidative phosphorylation /ETC	<ul style="list-style-type: none"> <li>• Diagrammatically illustrate the organization of electron transport chain (ETC) depicting the flow of electrons</li> <li>• Enlist the components of complex I, II, III, and IV</li> <li>• Enumerate clinically important inhibitors of electron transport chain and mention their site of action.</li> </ul>
	Respiratory chain & oxidative phosphorylation /ATP synthesis	<ul style="list-style-type: none"> <li>• Elaborate the structure of ATP synthase (complex V).</li> <li>• Explain how the free energy generated by the transport of electrons by ETC is used to produce ATP from ADP + Pi (i.e. chemiosmotic hypothesis)</li> <li>• Elaborate the effect of oligomycin and uncouplers on ATP production.</li> <li>• Describe the effect of arsenic poisoning on carbohydrate metabolism and ATP production.</li> <li>• Elaborate the glycerol 3-P shuttle and malate-aspartate shuttle for the transfer of reducing equivalents from cytosol into the mitochondria.</li> </ul>
	Nutrition/ Balanced diet	<ul style="list-style-type: none"> <li>• Define and classify nutrients into macro and micronutrients.</li> <li>• Elaborate the concept and importance of Balanced Diet</li> <li>• Enlist the components of balanced diet and elaborate the importance of each component.</li> </ul>
	Nutrition/ Special nutritional requirements	<ul style="list-style-type: none"> <li>• Delineate special nutritional requirements during pregnancy, lactation, growth, and old age.</li> <li>• Suggest dietary advice for patients suffering from diabetes mellitus, hypertension, obesity, renal disease, lactose intolerance, gluten enteropathy, hypercholesterolemia, and hemorrhoids.</li> </ul>
	Nutrition/ PEM	<ul style="list-style-type: none"> <li>• Enlist causes and types of Protein Energy Malnutrition (PEM).</li> <li>• Differentiate between Kwashiorkor and Marasmus based on the given data</li> <li>• Enlist symptoms and signs</li> <li>• Outline treatment strategies</li> </ul>
		<ul style="list-style-type: none"> <li>• Define energy balance.</li> </ul>

	Nutrition/ Caloric requirements	<ul style="list-style-type: none"> <li>• Compare the energy content of macro nutrients and alcohol.</li> <li>• Suggest a simple method for estimation of caloric requirements of sedentary adults, moderately active adults, and very active adults</li> </ul>
	Nutrition/ BMR	<ul style="list-style-type: none"> <li>• Define basal metabolic rate (BMR)</li> <li>• Elaborate the effect of various physiological and pathological factors on BMR.</li> </ul>
	Nutrition/ BMI & Obesity	<ul style="list-style-type: none"> <li>• Define body mass index (BMI).</li> <li>• Categorize individuals into underweight, normal, overweight, obese, and morbidly obese based on their BMI values.</li> <li>• Elaborate the role of genetic, environmental, and behavioral factors in determining body weight.</li> <li>• Clearly differentiate between upper body obesity and lower body obesity.</li> <li>• Enlist health risks associated with obesity.</li> </ul>
	Malnutrition	<ul style="list-style-type: none"> <li>• Define Marasmus and Kwashiorkor</li> <li>• Define Malnutrition</li> <li>• Identify various causes of malnutrition</li> <li>• Identify the risk factors of malnutrition</li> <li>• Outline treatment strategies</li> </ul>

➤ **Aging**

Topic	Sub Topic	Learning objectives
<b>Aging</b>	Preventive Medicine in Geriatrics	<ul style="list-style-type: none"> <li>• Identify causes and risk factors for malnutrition in elderly</li> <li>• Outline treatment strategies</li> </ul>

➤ **Pathophysiology and Pharmacotherapeutics**

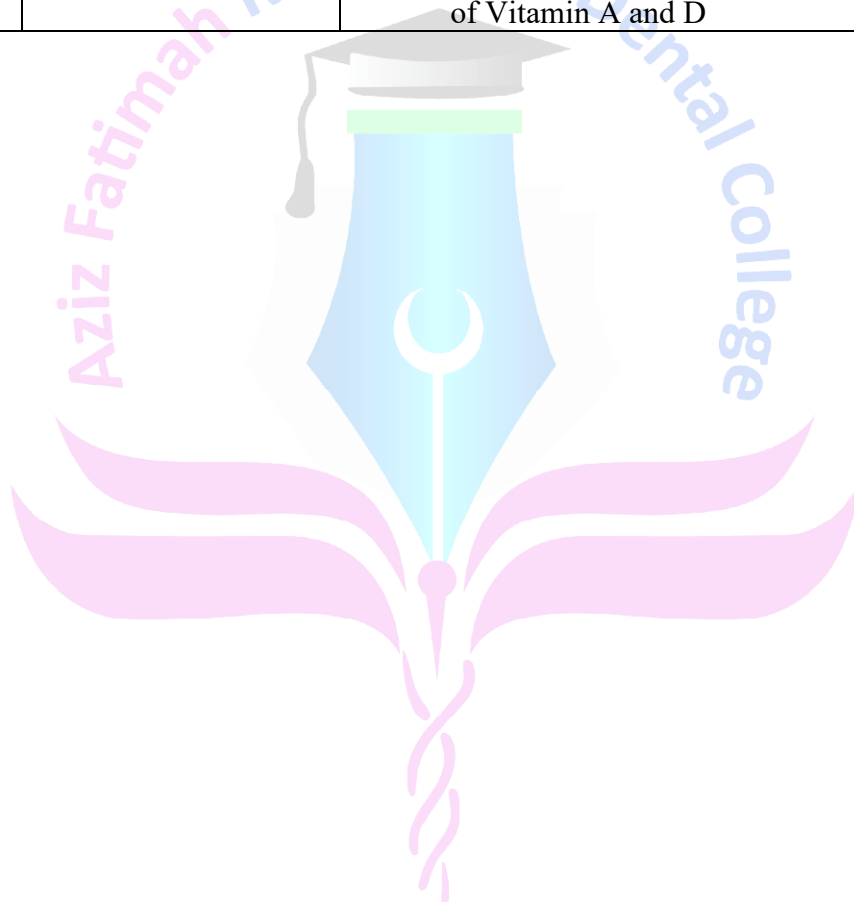
Topic	Sub Topic	Learning objectives
<b>Pharmacotherapeutics</b>	Anti-Diarrheal Drugs	<ul style="list-style-type: none"> <li>• Classify anti diarrheal drugs and describe the pharmacokinetics, mechanism of action, pharmacological effects, uses and adverse effects</li> </ul>
		<ul style="list-style-type: none"> <li>• Define gastritis.</li> </ul>

<b>Pathophysiology</b>	Gastritis	<ul style="list-style-type: none"> <li>• Enlist the types of gastritis</li> <li>• Describe the morphological features of gastritis</li> </ul>
	Peptic Ulcer	<ul style="list-style-type: none"> <li>• Describe the salient feature of peptic ulcer disease</li> <li>• Discuss the role of H. Pylori in causing peptic ulcer disease</li> </ul>
	Infectious agents causing Diarrhea	<ul style="list-style-type: none"> <li>• Enumerate common infectious agents of diarrheal diseases</li> <li>• Discuss pathogenesis and clinical features of common pathogens</li> </ul>

➤ **Disease Prevention & Impact**

<b>Topic</b>	<b>Sub Topic</b>	<b>Learning objectives</b>
<b>Behavioral Sciences</b>	Health related behaviors	<ul style="list-style-type: none"> <li>• Identify health related behaviors and apply principles of learning to modify eating and addictive patterns</li> </ul>
	Health related believes	<ul style="list-style-type: none"> <li>• Discuss health belief model and its application in managing common presentations related to gastro-intestinal system</li> <li>• Explain the trans theoretical model of changing behaviors to modify the diseases pattern</li> </ul>
	Management of Obesity	<ul style="list-style-type: none"> <li>• Describe motivational interviewing and outline a management plan to help the individuals with obesity and diabetes to lose weight</li> </ul>
	Medically Un described Symptoms	<ul style="list-style-type: none"> <li>• Describe and distinguish Medically Un described Symptoms (MUS)</li> <li>• Describe the association of psychosocial factors with MUS</li> <li>• Outline the principles of management plan according to biopsychosocial model</li> <li>• Describe role of Cognitive Behavioral Therapy (CBT)</li> </ul>
	Role of nutritional deficiencies in mental development	<ul style="list-style-type: none"> <li>• To identify effect on mental development of nutritional deficiencies</li> </ul>
	Epidemiology of communicable	<ul style="list-style-type: none"> <li>• Describe prevention and control of polio, viral hepatitis A, cholera, typhoid and food</li> </ul>

<b>Community Medicine</b>	diseases (Intestinal infection)	poisoning <ul style="list-style-type: none"> <li>Describe prevention and control of amoebiasis, ascariasis, hook worm infestation</li> </ul>
	Preventive medicine in pediatrics	<ul style="list-style-type: none"> <li>Describe the advice to be given for breast feeding, weaning and childhood</li> <li>Discuss risk factors, prevention and management of protein energy malnutrition (PEM)</li> </ul>
	Nutrition & Health	<ul style="list-style-type: none"> <li>Describe balanced diet for adult and obesity</li> <li>Plot and interpret growth chart for children under 5 years of age</li> <li>Describe prevention and control of deficiency of Vitamin A and D</li> </ul>

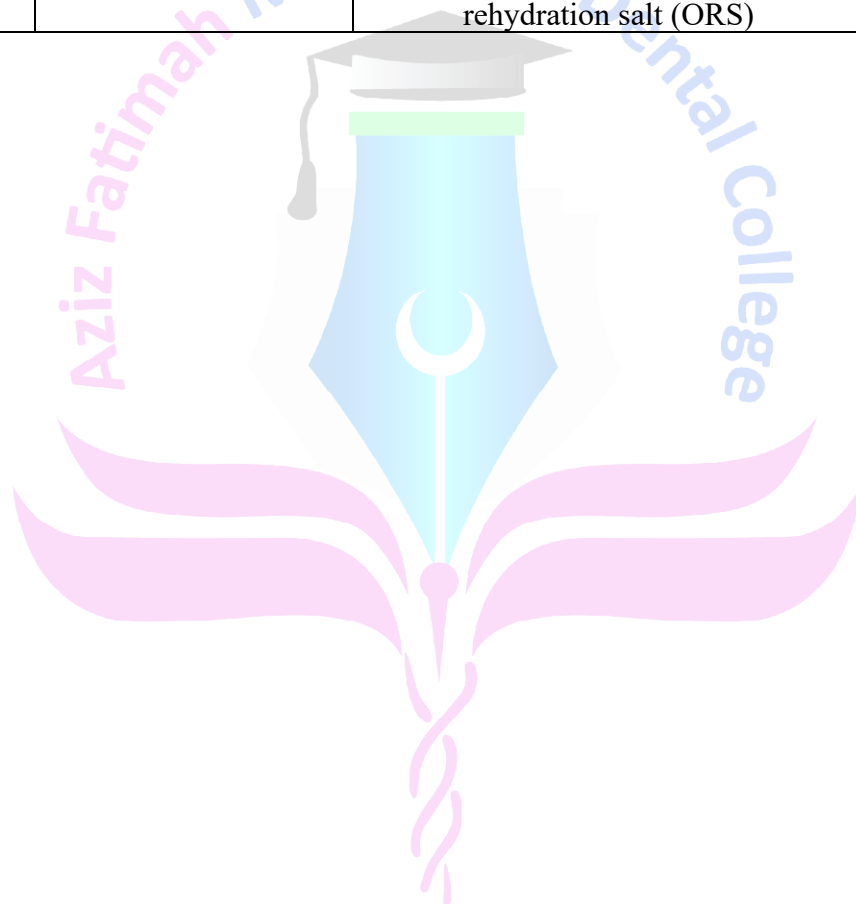


### 5.3.2. Skills

#### ➤ Practical

Topic	Sub Topic	Learning objectives
<b>Histology</b>	Oral Cavity	<ul style="list-style-type: none"> <li>Identify, draw and label the histological sections of Tongue and Lips and enumerate points of identification</li> </ul>
	Salivary Gland	<ul style="list-style-type: none"> <li>Identify, draw and label the histological sections of Salivary glands (Submandibular, Sublingual and Parotid)</li> </ul>
	Upper GIT	<ul style="list-style-type: none"> <li>Identify, draw and label the histological structure of the esophagus and enumerate points of identification</li> <li>Identify, draw and label the histological structure of stomach and enumerate points of identification</li> </ul>
	Small Intestine	<ul style="list-style-type: none"> <li>Identify, draw and label the histological structure of small intestine (Duodenum, Jejunum, and Ileum) and enumerate points of identification</li> </ul>
	Large Intestine	<ul style="list-style-type: none"> <li>Identify, draw and label the histological structure of large intestine and enumerate points of identification</li> </ul>
	Organs associated with GIT	<ul style="list-style-type: none"> <li>Identify, draw and label the histological sections of Gall bladder, liver and enumerate points of identification</li> </ul>
	Organs associated with GIT	<ul style="list-style-type: none"> <li>Identify, draw and label the histological sections of pancreas and enumerate points of identification</li> </ul>
	Lymphatic tissue associated with GIT	<ul style="list-style-type: none"> <li>Identify, draw and label the histological sections of Palatine tonsil, appendix, peyer's patches and enumerate points of identification</li> </ul>
<b>Biochemistry</b>	Estimations of blood/urine analytes	<ul style="list-style-type: none"> <li>Estimate blood glucose level by glucose oxidase method and interpret the results</li> <li>Determine blood glucose level by glucometer and interpret the result.</li> <li>Perform Glucose tolerance test (GTT) and interpret the results.</li> <li>Determine urine glucose by dipstick method</li> </ul>

		<p>and interpret the result.</p> <ul style="list-style-type: none"> <li>Estimate serum amylase and interpret the result.</li> </ul>
	Interpretation of results	<ul style="list-style-type: none"> <li>Interpret the results of Lactose tolerance test.</li> </ul>
	Determination & interpretation of results	<ul style="list-style-type: none"> <li>Determine BMI of given subject and interpret the results.</li> </ul>
<b>Physiology</b>	Cranial nerve	<ul style="list-style-type: none"> <li>Demonstrate Cranial nerve V, IX &amp; X testing</li> </ul>
<b>Pathology</b>	Gastritis	<ul style="list-style-type: none"> <li>Describe salient features of acute &amp; chronic gastritis</li> </ul>
<b>Pharmacology</b>	ORS	<ul style="list-style-type: none"> <li>Preparation and calculation of oral rehydration salt (ORS)</li> </ul>



### 5.3.3. C-FRC for GIT and Nutrition-1 Module

<b>GIT AND NUTRITION-1 MODULE</b>		
<b>Objectives</b>	<b>Skill</b>	<b>Miller's Pyramid Level Reflected</b>
Demonstrate steps of abdominal examination	Abdominal Examination	Shows
Demonstrate the procedure of shifting dullness	shifting dullness	Shows
Identify organs on X-ray abdomen	X-ray Abdomen	Shows
Assess dehydration in infant/young child and explain procedure of making home made ORS	Dehydration	Does



timah Medical & Dental



# RENAL-1 MODULE



## **6. Introduction of Renal-1 Module**

Welcome to the renal module, an essential component of your second-year MBBS curriculum. This module aims to provide you with a thorough understanding of the renal system, its anatomy, functions, and disorders. The renal system, comprising the kidneys and urinary tract, is crucial for maintaining bodily homeostasis and eliminating waste products.

Throughout this module, we will explore the intricate structures and functions of the kidneys, delving into both microscopic and macroscopic aspects. You will gain insights into renal physiology, including filtration, reabsorption, and secretion processes, which are pivotal in urine formation and electrolyte balance regulation.

Moreover, this module will address the pathophysiology of renal disorders, ranging from common conditions like urinary tract infections and kidney stones to more complex ailments such as acute kidney injury and chronic kidney disease. Recognizing and managing these conditions are fundamental skills for any medical practitioner.

We will also emphasize the systemic importance of renal function, understanding its interplay with other organ systems and its implications for overall health. Through this interdisciplinary approach, you will be equipped to provide comprehensive care to patients with renal disorders.

Approach this module with enthusiasm and dedication, as mastering the concepts presented here will lay a solid foundation for your clinical practice. Let us embark on this journey together, exploring the fascinating world of renal medicine and its profound impact on patient care.

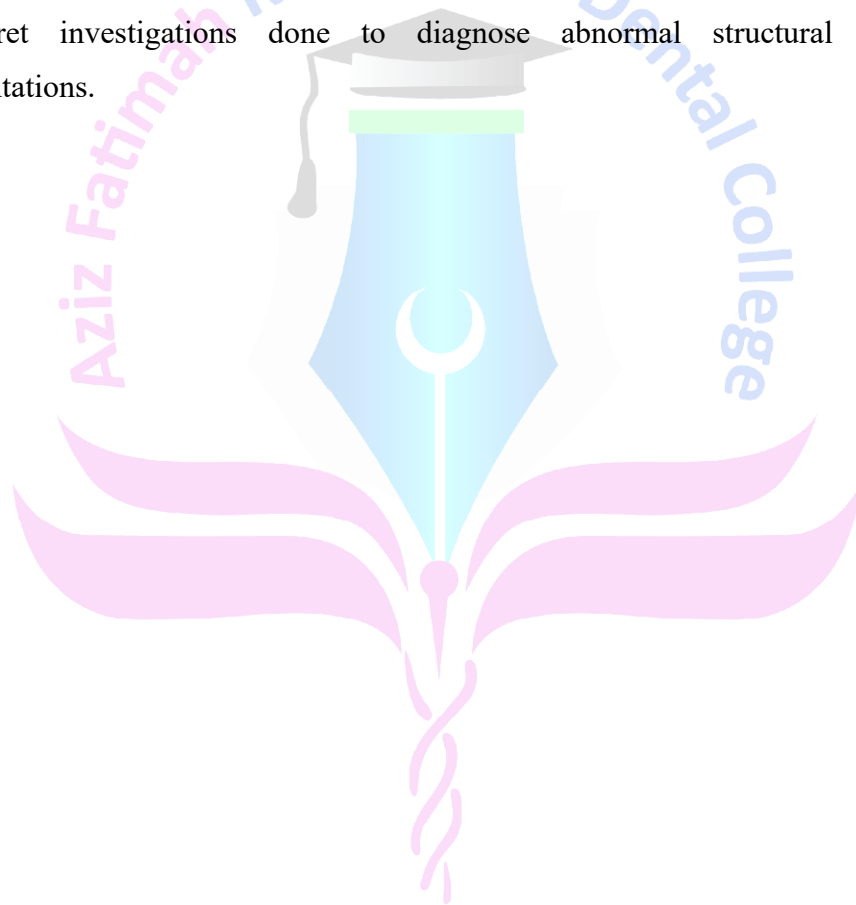
## 6.1. Module Rationale

The renal module for second-year MBBS (Bachelor of Medicine, Bachelor of Surgery) students is a crucial component of the medical curriculum. This module is designed to provide students with a comprehensive understanding of the structure, function, and pathology of the kidneys, as well as the principles of renal physiology and the clinical management of and electrolyte balance, acid-base balance, and blood pressure. Understanding renal physiology is essential for comprehending various disease renal disorders. Here are some key rationales for including a renal module in the curriculum:



## 6.2. Module Outcomes

- Discuss the gross and microscopic anatomy of kidney and urinary system.
- Explain the embryological development of kidney and urinary tract
- Explain common developmental abnormalities of renal system
- Identify role of renal system in maintaining blood pressure and acid base balance
- Enlist functions of kidney and pathologies related to them.
- Explain method of electrolyte balance and pathologies related to it.
- Highlight pathologies related to kidneys and their distinctive clinical features
- Interpret investigations done to diagnose abnormal structural and functional presentations.



### 6.3. Learning Objectives

#### 6.3.1. Knowledge

##### ➤ Thorax

Topic	Sub Topic	Learning objectives
<b>Gross Anatomy</b>	Kidney	<ul style="list-style-type: none"> <li>Describe gross features and facial coverings of kidneys.</li> <li>Compare and contrast the relations of right and left kidneys.</li> <li>Describe blood supply, lymphatics and nerve supply of kidney</li> <li>Discuss the clinical aspects of kidneys</li> <li>Demonstrate the surface marking and radiographic anatomy of kidney.</li> <li>Identify the side of kidney</li> </ul>
	Ureter	<ul style="list-style-type: none"> <li>Compare and contrast the relations of right and left ureter</li> <li>Give the constrictions of ureter</li> <li>Describe the blood supply nerve supply and lymphatics of ureter</li> <li>Identify the ureter.</li> </ul>
	Urinary bladder	<ul style="list-style-type: none"> <li>Describe the gross anatomical features, relations, surfaces, blood supply, nerve supply and lymphatics of urinary bladder</li> <li>Give the clinical correlates of urinary bladder</li> <li>Identify the gross features and surfaces of urinary bladder</li> </ul>
	Sign/symptom/investigations	<ul style="list-style-type: none"> <li>Interpret basic urological signs/symptoms &amp; investigations.</li> </ul>
	Urinary retention	<ul style="list-style-type: none"> <li>Describe the etiology, and management of urinary retention.</li> </ul>

	Radiograph	<ul style="list-style-type: none"> <li>Identify and describe the various anatomic landmarks of the renal system on radiographs.</li> </ul>
	Urethra	<ul style="list-style-type: none"> <li>Describe the parts of urethra.</li> </ul>
<b>Embryology &amp; Post-Natal Development</b>	Development of a urinary system	<ul style="list-style-type: none"> <li>Describe the development of intermediate mesoderm and its derivatives</li> <li>Describe the development of pronephros, mesonephros and metanephros</li> <li>Describe positional changes during descent of kidney with correlation to its blood supply</li> <li>Describe the development of urinary bladder and urethra</li> <li>List and describe the common congenital anomalies of kidney, urinary bladder and urethra.</li> </ul>
<b>Microscopic Structure Histology</b>	Structure of kidney	<ul style="list-style-type: none"> <li>Describe the histological, structural organization and functions of kidney with clinicals.</li> </ul>
	Juxtaglomerular apparatus	<ul style="list-style-type: none"> <li>Describe the light and ultrastructure of the Juxtaglomerular apparatus and glomerular filtration barrier.</li> </ul>
	Structure of ureter	<ul style="list-style-type: none"> <li>Describe the histological structure of ureter</li> </ul>
	Structure of urinary bladder	<ul style="list-style-type: none"> <li>Describe the histological structure of urinary bladder</li> <li>Discuss clinical correlates (Cystitis, Urinary bladder cancer, Urinary Tract Infections (UTIs).</li> </ul>

➤ **Physiology**

Topic	Sub Topic	Learning objectives
<b>Medical Physiology</b>	Physiological anatomy of kidneys	<ul style="list-style-type: none"> <li>• Explain the general organization of the kidney and urinary tract</li> <li>• Explain the physiological anatomy of the nephron</li> </ul>
	Renal Blood Supply	<ul style="list-style-type: none"> <li>• Explain the renal blood supply</li> </ul>
	Diuretics	<ul style="list-style-type: none"> <li>• Discuss the sites and mechanism of action of different diuretics</li> </ul>
	Body fluid compartment	<ul style="list-style-type: none"> <li>• Describe major composition of intracellular and extracellular fluids</li> <li>• Define Hypo and hypernatremia</li> <li>• Explain the causes of hypo &amp; hypernatremia and their effects on Composition of body fluid compartments</li> <li>• Describe difference between iso-osmotic, hyperosmotic, hypo-osmotic fluids</li> </ul>
	Edema	<ul style="list-style-type: none"> <li>• Enumerate causes of Intracellular and extracellular edema</li> <li>• Describe safety factors that prevent edema</li> </ul>
	Function	<ul style="list-style-type: none"> <li>• Explain the functions of the kidney</li> </ul>
	Micturition reflex	<ul style="list-style-type: none"> <li>• Describe the mechanism of micturition and its control</li> <li>• Explain the role of higher center on micturition</li> <li>• Explain the physiological anatomy and innervation of bladder</li> <li>• Discuss the voluntary control of micturition</li> </ul>
	Abnormalities of micturition	<ul style="list-style-type: none"> <li>• Explain the causes, pathophysiology, and features of atonic bladder.</li> <li>• Discuss the causes, pathophysiology, and features of automatic bladder.</li> </ul>

		<ul style="list-style-type: none"> <li>• Write the causes, pathophysiology, and features of uninhibited neurogenic bladder</li> </ul>
	Urine formation	<ul style="list-style-type: none"> <li>• Enlist the steps of urine formation.</li> <li>• Explain the physiological anatomy and functions of glomerular capillary membrane</li> <li>• Discuss the composition of filtrate</li> <li>• Explain the minimal change nephropathy and increase permeability to plasma protein</li> </ul>
	Glomerular filtration	<ul style="list-style-type: none"> <li>• Define Glomerular Filtration Rate (GFR).</li> <li>• Describe the determinants of GFR</li> <li>• Explain the factors affecting GFR Discuss the hormones and autocooids that affect GFR</li> <li>• Explain mechanisms of autoregulation of GFR</li> <li>• Enlist the physiological and pathological factors that decrease GFR</li> <li>• Explain the effects of angiotensin II blocker on GFR during renal hypoperfusion</li> </ul>

	Reabsorption	<ul style="list-style-type: none"> <li>• Enumerate different types of transport along the kidney tubules for reabsorption</li> <li>• Explain the reabsorption and secretion along different parts of the Nephron</li> <li>• Explain the regulation of tubular reabsorption</li> <li>• Discuss the forces/pressure and hormones that</li> <li>• Determine renal tubular reabsorption</li> <li>• Explain the reabsorption of water along different parts of nephron</li> <li>• Define obligatory and facultative reabsorption</li> <li>• Discuss the characteristics of late distal tubules and cortical collecting ducts</li> <li>• Discuss the characteristics of medullary collecting ducts</li> </ul>
	Clearance method	<ul style="list-style-type: none"> <li>• Explain the use of clearance method to quantify kidney function</li> </ul>
	Transport maximum	<ul style="list-style-type: none"> <li>• Describe mechanism of re-absorption of sodium along different parts nephrons</li> <li>• Define and explain the term Transport maximum for the substances</li> <li>• Define filtered load for the substance</li> <li>• Justify the difference of transport maximum and renal threshold of glucose in renal tubules</li> </ul>
	Urine concentration and dilution	<ul style="list-style-type: none"> <li>• Explain the renal mechanisms for excreting Dilute urine</li> <li>• Explain the mechanism for forming a concentrated urine</li> <li>• Discuss the role of urea in the process of counter current multiplier mechanism</li> <li>• Describe the countercurrent exchange in vasa Recta to preserve hyperosmolarity of renal medulla</li> </ul>

	Obligatory urine volume	<ul style="list-style-type: none"> <li>Define and explain the term obligatory urine volume.</li> <li>Define and explain free water clearance.</li> <li>Define Urine specific gravity.</li> </ul>
	Disorders of urine concentrating ability	<ul style="list-style-type: none"> <li>Enumerate different abnormalities of urinary concentrating ability</li> </ul>
	Diabetes insipidus	<ul style="list-style-type: none"> <li>Enumerate the types of Diabetes insipidus</li> <li>Enlist the features of diabetes insipidus</li> <li>Explain the pathophysiology and treatment of central diabetes insipidus</li> <li>Discuss the pathophysiology of nephrogenic diabetes insipidus</li> </ul>
	Osmoreceptor ADH Feedback System	<ul style="list-style-type: none"> <li>Make the flow chart to show the Osmoreceptorantidiuretic hormone (ADH) feedback mechanism for regulating extracellular fluid osmolarity in response to a water deficit.</li> <li>Enlist the factors which increase and decrease the release of ADH</li> </ul>
	Thirst	<ul style="list-style-type: none"> <li>Explain the mechanism of thirst</li> </ul>
	Renal regulation of potassium	<ul style="list-style-type: none"> <li>Enumerate the factors that can alter potassium distribution between intracellular and extracellular fluids</li> <li>Discuss the process of secretion of potassium by renal tubules Explain the regulation of internal potassium distribution and potassium secretion</li> </ul>
	Control of ECF osmolarity	<ul style="list-style-type: none"> <li>Explain the control of extracellular fluid osmolarity and sodium concentration</li> </ul>
	Control of ECF	<ul style="list-style-type: none"> <li>Explain the integration of renal mechanism for control of Extracellular Fluid (ECF)</li> <li>Explain the importance of pressure natriuresis and diuresis in maintaining body sodium and fluid balance</li> </ul>
	Renal regulation of calcium	<ul style="list-style-type: none"> <li>Explain the renal handling of calcium concentration to regulate plasma calcium concentration</li> <li>Renal regulation of phosphate</li> </ul>

		<ul style="list-style-type: none"> <li>• Enumerate the factors that alter renal calcium</li> <li>• Enlist the factors that alter renal phosphate excretion</li> </ul>
	Renal body fluid feedback control	<ul style="list-style-type: none"> <li>• Explain the nervous and hormonal factors that increase the effectiveness of renal body fluid feedback control</li> </ul>
	ECF and Blood Volume	<ul style="list-style-type: none"> <li>• Explain the conditions that cause large increase in blood volume and ECF volume</li> <li>• Explain the conditions that cause large increase ECF volume but with normal blood volume</li> </ul>
	Acid base balance	<ul style="list-style-type: none"> <li>• Explain the renal handling of H<sup>+</sup> ion.</li> </ul>
	Acid base disturbance	<ul style="list-style-type: none"> <li>• Analyze the acid base disturbances on the basis of pH, HCO<sub>3</sub> and CO<sub>2</sub></li> <li>• Explain the causes and compensation of metabolic acidosis</li> <li>• Explain the causes and compensation of metabolic alkalosis</li> <li>• Explain the causes and compensation of respiratory acidosis</li> <li>• Explain the causes and compensation of respiratory alkalosis</li> <li>• Explain the causes and compensation of mixed acid base disorder</li> </ul>
	Anion gap	<ul style="list-style-type: none"> <li>• Define and explain anion gap</li> </ul>

➤ **Medical Biochemistry**

Topic	Sub Topic	Learning objectives
<b>Medical Biochemistry</b>	Purine metabolism	<ul style="list-style-type: none"> <li>• Discuss the synthesis and degradation of purines (De-Novo and salvage pathway)</li> </ul>
	Pyrimidine metabolism	<ul style="list-style-type: none"> <li>• Discuss the synthesis and degradation of pyrimidine (De-Novo and salvage pathway)</li> </ul>
	Nucleotide metabolism	<ul style="list-style-type: none"> <li>• Outline the sequence of reactions that converts IMP to AMP and GMP and to their corresponding triphosphates</li> </ul>
	Regulation of purine and pyrimidine	<ul style="list-style-type: none"> <li>• Discuss the regulation of purine and pyrimidine biosynthesis and degradation</li> </ul>
	Purine metabolism disorders	<ul style="list-style-type: none"> <li>• Interpret the Lesh-Nhyan syndrome. Gout, SCID/ADA on basis of sign symptoms and data</li> </ul>
Pyrimidine metabolism disorders	<ul style="list-style-type: none"> <li>• Interpret Orotic aciduria in relevance to nucleotides and urea</li> </ul>	

		<ul style="list-style-type: none"> <li>• Differentiate between CPS I and II</li> </ul>
	Analogues of nucleotides	<ul style="list-style-type: none"> <li>• Interpret the role of synthetic analogues of nucleotides in medicine based on sign/symptoms and data e.g Methotrexate, 5 Flurouracil and Allupurinol.</li> <li>• Interpret the role of PABA analogs and mycophenolic acid in purine biosynthesis</li> </ul>
	Role of Ribonucleotide reductase	<ul style="list-style-type: none"> <li>• Discuss the role of Ribonucleotide reductase in Nucleotide metabolism (hydroxyurea)</li> </ul>
	Acid Base balance imbalance/ Types of acid base disorders	<ul style="list-style-type: none"> <li>• Define acidosis and alkalosis.</li> <li>• Classify acid base disorders.</li> <li>• Enlist causes of metabolic acidosis and give its compensation. Enlist causes of respiratory acidosis and give its compensation.</li> <li>• Enlist causes of metabolic alkalosis and give its compensation.</li> <li>• Enlist causes of respiratory alkalosis and give its compensation.</li> </ul>
	Acid Base balance imbalance/ Tetany in alkalosis	<ul style="list-style-type: none"> <li>• Interpret disorders metabolic and respiratory disorders of acid base balance on basis of sign, symptoms and arterial blood gas (ABG) findings</li> <li>• Give biochemical explanation for tetany associated with alkalosis</li> </ul>

➤ **Pathophysiology and Pharmacotherapeutics**

Topic	Sub Topic	Learning objectives
<b>Pharmacology &amp; Therapeutics</b>	Diuretics	<ul style="list-style-type: none"> <li>Classify diuretics &amp; carbonic anhydrase inhibitor. MOA, clinical uses, and adverse effects</li> <li>Describe Thiazide &amp; loop diuretics their Mechanism of Action, clinical uses, and adverse effects.</li> <li>Describe Potassium sparing and osmotic diuretics their mechanism of action, clinical uses, and adverse effects.</li> </ul>
	Renal Stones	<ul style="list-style-type: none"> <li>Discuss the etiology and pathogenesis of different types of stones</li> </ul>
<b>Pathology</b>	Hydronephrosis	<ul style="list-style-type: none"> <li>Identify the causes, morphological aspect &amp; outcome of hydronephrosis</li> </ul>
	Pyelonephritis	<ul style="list-style-type: none"> <li>Define pyelonephritis and enumerate its types.</li> <li>Describe the morphological features of acute and chronic pyelonephritis</li> </ul>
	Cystitis	<ul style="list-style-type: none"> <li>Define acute and chronic cystitis.</li> <li>Describe morphological features of different types of cystitis.</li> </ul>
	UTI causative agents	<ul style="list-style-type: none"> <li>Enlist common causative agents of urinary tract infections and describe pathogenesis and clinical features of common causative agents of UTI.</li> </ul>
	Glomerulonephritis	<ul style="list-style-type: none"> <li>Define various presentations of glomerulonephritis.</li> <li>Define nephrotic and nephritic syndrome.</li> <li>List various risk factors and outline management of glomerulonephritis.</li> </ul>
	Acute Kidney Injury	<ul style="list-style-type: none"> <li>Define AKI (acute kidney injury)</li> <li>Identify various risk factors and causes for AKI. Outline management strategies.</li> </ul>

	Urinary tract infection	<ul style="list-style-type: none"> <li>• Define UTI (Urinary Tract Infection)</li> <li>• Identify various risk factors and causes of UTI.</li> <li>• Describe signs and symptoms of UTI.</li> <li>• Outline management strategies.</li> </ul>
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➤ **Aging**

Topic	Sub Topic	Learning objectives
Aging	Disease prevention	<ul style="list-style-type: none"> <li>• To define preventive care in diseases related to urinary system (adults).</li> <li>• Primary, secondary, and tertiary prevention.</li> </ul>
	Urinary incontinence	<ul style="list-style-type: none"> <li>• Define urinary incontinence.</li> <li>• Outline management strategies.</li> </ul>

➤ **Disease Prevention & impact**

Topic	Sub Topic	Learning objectives
Community Medicine and Public Health	Quality of life	<ul style="list-style-type: none"> <li>• Discuss the significance of quality of life in disease and treatment settings.</li> <li>• Measures of health status. Disability-Adjusted Life Year (DALY) and Quality-Adjusted Life Year (QALY) Life expectancy</li> </ul>
Behavioral Sciences	Dementia, uremic encephalopathy, delusion, muscle paralysis & Societal impact	<ul style="list-style-type: none"> <li>• To identify the behavioral abnormalities caused by renal function.</li> <li>• To identify the cognitive abnormality.</li> <li>• To identify the dangers for the patient, his family, and society.</li> </ul>

### 6.3.2. **Skills**

➤ **Practical's**

Topic	Sub Topic	Learning objectives
Histology	Kidney	<ul style="list-style-type: none"> <li>Identify and draw and label the histological structure of kidney and enumerate points of identification</li> </ul>
	Ureter	<ul style="list-style-type: none"> <li>Identify, draw and label the histological structure of ureter and enumerate its points of identification</li> </ul>
	Urinary bladder	<ul style="list-style-type: none"> <li>Identify, draw and label the histological structure of urinary bladder and enumerate its points of identification</li> </ul>
Biochemistry	Interpretation of results	<ul style="list-style-type: none"> <li>Estimate blood urea level and interpret your results.</li> <li>Estimate serum creatinine level and interpret your results.</li> <li>Determination of proteins in urine by dipstick method and interpret your results.</li> <li>Estimate serum acid phosphatase level and interpret your results.</li> </ul>
Physiology	Interpretation of report	<ul style="list-style-type: none"> <li>Perform a complete examination of the urine sample URS-10 (using urine reagent-10) and interpret its report</li> <li>Determine the specific gravity of urine</li> </ul>
Pharmacology	Diuretics	<ul style="list-style-type: none"> <li>Label the diagram showing the site of action of diuretics along with examples</li> <li>Tabulate the effects of various diuretics on urinary electrolytes and pH</li> </ul>

<b>Pathology</b>	Pyelonephritis	<ul style="list-style-type: none"><li>• Identify morphological features of acute pyelonephritis</li><li>• Identify morphological features of Chronic pyelonephritis</li></ul>
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### 6.3.3. C-FRC for Renal-1 Module

RENAL MODULE		
Objectives	Skill	Miller's Pyramid Level Reflected
Detail the steps of urinary catheterization in females	*Catheterization	Knows how
Detail the steps of urinary catheterization in males	*Catheterization	Knows how



## 7. Attitude

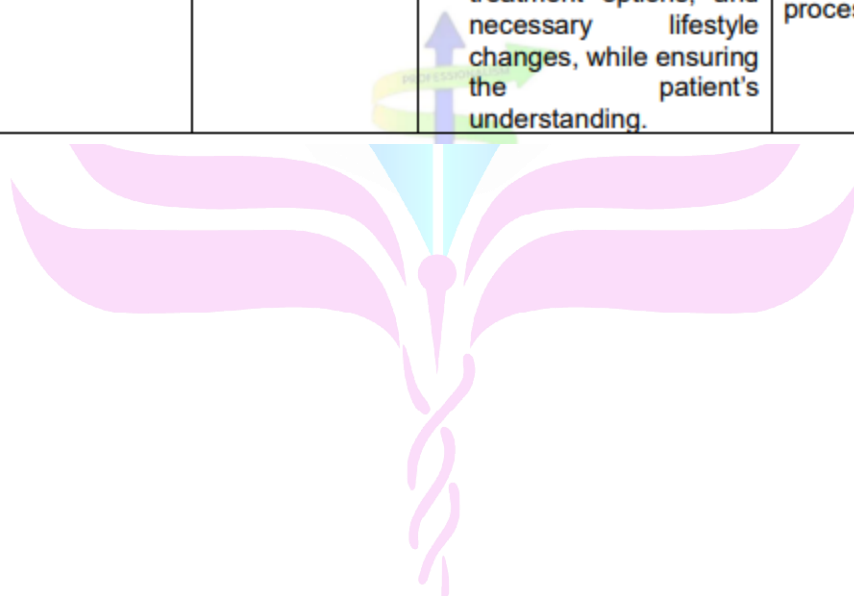
### ➤ PERL's for Block-IV

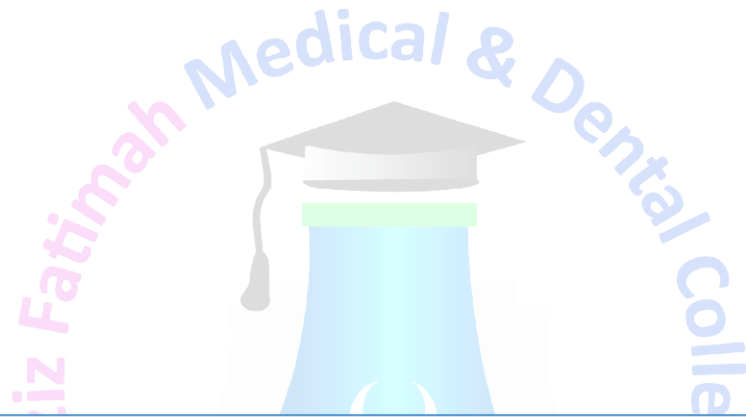
GIT & NUTRITION-I				
<i>*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block</i>				<b>Total Hours = 7.5</b>
Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
	<b>Professionalism</b>	Self-awareness & Improvement Planning	<ul style="list-style-type: none"> <li>Appreciate the need to develop self-awareness by reflecting on personal strengths and areas for improvement, and create actionable improvement plans to enhance academic performance and professional development.</li> <li>Conduct a self-assessment to identify their strengths and weaknesses in academic and clinical tasks, and create a detailed improvement plan to address areas where growth is needed.</li> </ul>	Submit a self-assessment report outlining your strengths and weaknesses, along with a personalized improvement plan that includes specific strategies and goals for enhancing your skills and knowledge.
	<b>Leadership</b>	Role Modelling via Mentoring Session III	<ul style="list-style-type: none"> <li>Participate in a mentoring session where to discuss their strengths and weaknesses with their mentor, receive feedback, and collaboratively create an action plan for personal and professional development.</li> <li>Share self-Assessment report with mentors for further guidance.</li> </ul>	Submit a summary of your mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth.
	<b>Ethics</b>	Patient Confidentiality	<ul style="list-style-type: none"> <li>Discuss the ethical principles of patient confidentiality, including the importance of</li> </ul>	Submit a reflection on a case study involving patient confidentiality.

			<p>protecting patient information and the legal and professional consequences of breaching confidentiality.</p> <ul style="list-style-type: none"> <li>Review a clinical scenario involving patient confidentiality and identify how the principles of confidentiality were maintained or breached, proposing strategies for improvement where necessary.</li> </ul>	<p>Discuss the actions taken to protect patient information and reflect on the ethical responsibilities of healthcare professionals in maintaining confidentiality.</p>
	<b>Leadership</b>	Basics of Teamwork	<ul style="list-style-type: none"> <li>Describe the roles and responsibilities of a team member in healthcare, including the importance of collegiality &amp; effective information sharing</li> <li>Describe the stages of team dynamics</li> <li>Appraise how team dynamics influence performance and outcomes.</li> <li>Self-assessment as a team member/leader using e.g. The Blake and Mouton Managerial Grid Leadership Self-Assessment Questionnaire</li> </ul>	<p>Submit results of leadership self-assessment.</p>
	<b>Research</b>	Building Evidence-Based Arguments	<ul style="list-style-type: none"> <li>Discuss the principles of constructing an evidence-based argument, including developing a clear research question or thesis, organizing the argument in a logical sequence, critically appraising and using relevant scientific</li> </ul>	<p>Submit a written argument on a medical topic, demonstrating how you structured your argument and incorporated evidence from scientific literature to support your claims.</p>
			<p>evidence, acknowledging counterarguments, ensuring coherence, and properly citing sources to support claims in medical writing and discussions.</p>	

RENAL-I				
<i>*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block</i>				<b>Total Hours = 4.5</b>
Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
	<b>Professionalism</b>	Time Management	<ul style="list-style-type: none"> <li>Discuss the importance of effective time management in medical education and practice, and develop strategies to prioritize tasks, manage academic responsibilities, and maintain a healthy work-life balance. Create a weekly schedule that prioritizes academic tasks, clinical work, and personal activities, demonstrating their ability to manage time effectively</li> </ul>	Submit a time management plan outlining your weekly schedule, including study hours, clinical tasks, and personal time. Reflect on how this plan helps you balance your responsibilities and improve productivity.
	<b>Ethics</b>	Informed Consent	<ul style="list-style-type: none"> <li>Discuss the ethical and legal principles of informed consent, including the patient's right to make autonomous decisions based on clear, accurate, and comprehensive information about their treatment options, risks, and benefits. Review a case scenario and practice obtaining informed consent,</li> </ul>	Submit a reflection on a case where you practiced or observed the informed consent process. Discuss how the information was communicated to the patient and how patient autonomy was respected.

			ensuring they provide clear explanations of the risks, benefits, and alternatives, and confirming patient understanding.	
	<b>Leadership</b>	Patient Counselling about disease	<ul style="list-style-type: none"> <li>Discuss the principles of effective patient counseling, focusing on clear and empathetic communication to explain disease conditions, treatment options, and lifestyle modifications, ensuring patient understanding and engagement in their care.</li> </ul> <p>Practice counseling a simulated patient about a disease, using clear, empathetic communication to explain the diagnosis, treatment options, and necessary lifestyle changes, while ensuring the patient's understanding.</p>	<p>Create and submit a poster illustrating the key steps involved in patient counseling for a specific disease, including how to explain the diagnosis, treatment options, and lifestyle modifications. Highlight strategies to ensure patient comprehension and engagement in the decision-making process.</p>





**ASSESSMENT POLICY 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.

### 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)

### 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/Clinical Clerkships sent to the Controller of Examinations through office of the Principal of the concerned college, at the end of each Block/Clinical Clerkships, as well as at the conclusion of the academic session along with the admission form for the professional examination.
  - d. Has been certified by the principal of his/her college:
    - i. of good character;
    - ii. of having attended not less than cumulative 75%\* of the full course of lectures delivered, practical and clinical rotations conducted in the particular academic session, while maintaining 75 % attendance in each Block/Clinical Clerkship,
    - iii. of having appeared at the Block/Clinical Clerkship Examinations conducted by the college of enrolment with at least 50 % marks\* in each Block/Clinical Clerkship examination, as well as in aggregate score of all Blocks/Clinical Clerkships examinations for the concerned year;
2. Written/Theory paper in all Professional Examinations in Modular Integrated MBBS or BDS Curricula shall consist of MCQs alone, with effect from Annual 2026 Examinations. (Ref: No. UHS/REG-25/2379, dated 17.11.2025)
3. The minimum number of marks required to pass the professional examination for each Block/Clinical Clerkship 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.
4. A candidate failing in one or more Blocks/Clinical Clerkships in the annual examination shall be provisionally allowed to join the next professional class till the commencement of supplementary examinations. The candidate, however, shall have to pass the failed Block/s

or Clinical Clerkship in this supplementary examination failing which he / she shall be detained in the professional year. Under no circumstances, a candidate shall be promoted to the next professional class till he/she has previously passed all the Blocks/Clinical Clerkships in the preceding professional examination.

If a student appears in the Supplementary Examination for the first time as he/she did not appear in the annual examination for any reason and failed in any Block/Clinical Clerkship in the Supplementary Examination, he/she will be detained in the same class and will not be promoted to the next class.

\*Notification No.UHS/REG-25/2351 Dated 13-11-2025

5. Only one annual and one supplementary of each Professional Examination shall be allowed in a particular academic session. However, 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.
6. Any student who fails to clear the First or Second Professional MBBS / First Professional BDS Examination, in four consecutive attempts, each, inclusive of both availed as well as un-availed attempts, 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 admission as a fresh candidate in either MBBS or BDS.
7. The application for admission of each candidate to the professional examination shall be submitted to the Controller of Examination, through the Principal of the College, on the prescribed format, as per notified schedule, accompanied by the prescribed fee.
8. The candidates shall pay their fee through the principal of their respective Colleges, who shall forward the Examination Forms along with the duly paid challan of the examination fee generated from the Online Examination Form.
9. The continuous internal assessment through the Block/Clinical Clerkship, conducted by the college of enrollment, shall carry 20% weightage in the total allocated marks for the concerned Block/Clinical Clerkship in the Professional Examination conducted by the university. The score will be equally distributed to the Written and “Oral/Practical/Clinical” Examinations.

10. The marks of internal assessment through Blocks/Clinical Clerkships examination and attendance record shall be submitted to Controller of Examinations, along with question papers and keys for the Block/Clinical Clerkship examination, within two weeks of completion of each Blocks/Clinical Clerkships examination.

Further, parent-teacher meetings shall be arranged by the colleges after every Block/Clinical Clerkship examination to share feedback on the progress of students with their parents. Minutes of parent teacher meetings, academic timetables/schedule of Blocks/Clinical Clerkships and academic year study guides shall be submitted to the Department of Medical Education UHS, as well.

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 colleges may arrange remedial classes and one re-sit for each Block/Clinical Clerkship examination after fulfillment of prescribed requirements given below. 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:

Block/Clinical Clerkship Attendance	Remedial Classes
<p>&lt;75%, ≥ 50% (50-74%)</p>	<ol style="list-style-type: none"> <li>1. Principal of the college may conduct remedial classes and submit result to the Examination Department, UHS, independently.</li> <li>2. Principal of the college may conduct remedial classes for detained students, who have short attendance in the first Block/Clinical Clerkship of a professional year after detention. The college may submit record of the remedial classes to the Examination Department, UHS, independently.</li> </ol>

<50%	<ol style="list-style-type: none"> <li>1. Principal of the college may submit attendance record of such students to Department of Medical Education, UHS, and seeking permission for conduct of remedial Classes. The conduct of remedial classes in such cases shall be arranged only after permission from the Competent Authority in the university.</li> <li>2. Authority in the university.</li> <li>3. The colleges shall also have to provide the university with the reasons submitted by the candidates for short attendance along with documentary evidence for the same duly verified by the principal.</li> <li>4. The following shall be considered as valid reasons for short attendance of the students for consideration of permission for remedial classes: <ol style="list-style-type: none"> <li>a. 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/Clinical Clerkship of the year), students clearing their preceding professional examination in supplementary, or late</li> <li>b. admitted students who have been permitted for joining by UHS</li> </ol> </li> </ol>
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Marks in Block/ Clinical Clerkship Examination	Re-sit Examination
<50% Marks/ Absence from Block /Clinical Clerkship Examination	<ol style="list-style-type: none"> <li>1. Principal of the college may submit record of such students to Department of Medical Education, UHS, and seeking permission for conduct of re-sit examination.</li> <li>2. The conduct of re-sit examination in all cases shall be arranged only after permission from the Competent Authority in the university.</li> </ol>

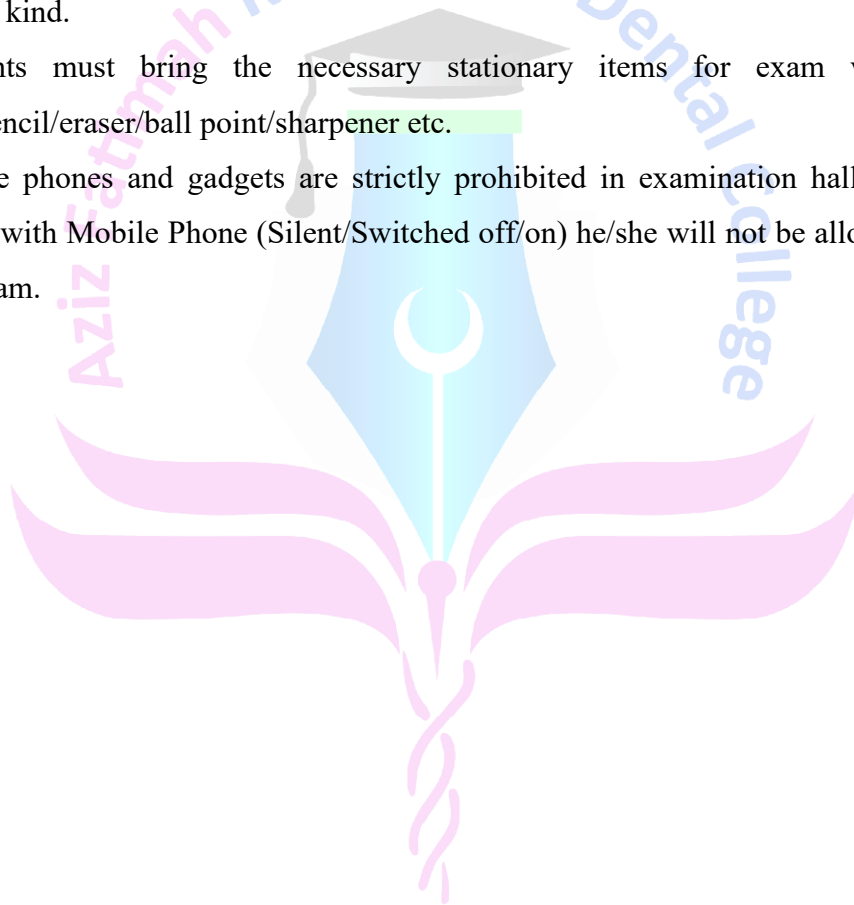
	<p><b>3.</b> The colleges shall also have to provide the university with the reasons submitted by the candidates for absence from the Block/Clinical Clerkship examination, along with documentary evidence for the same duly verified by the principal.</p> <p><b>4.</b> The following shall be considered as valid reasons for absence of a student from Block/Clinical Clerkship examination, and for consideration of permission for re-sit examination:</p> <ul style="list-style-type: none"> <li><b>a.</b> 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</li> <li><b>b.</b> Block/Clinical Clerkship of the year), students clearing their preceding professional examination in supplementary, or late admitted students who have been permitted for joining by UHS</li> </ul>
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**13.** The following policy shall be applicable for transition of students From Traditional Subject-Based Scheme to the Modular Integrated Curriculum Scheme:

- a.** The students who fail in all subjects of the professional examination, either by taking the examination or due to non-appearance, and are detained in the respective professional year, shall follow the Modular Integrated Curriculum Scheme for their teaching and assessment.
- b.** The students who fail in one or more subjects but not all the subjects of a professional examination, either by taking the examination or due to non- appearance, and are detained in the respective professional year, shall attend classes with students following the Modular Integrated Curriculum Scheme, but they will be examined in the failed subject/s according to their parent scheme, i.e., the Traditional Subject-Based Curriculum Scheme.

## 11. Examination Rules AFMDC

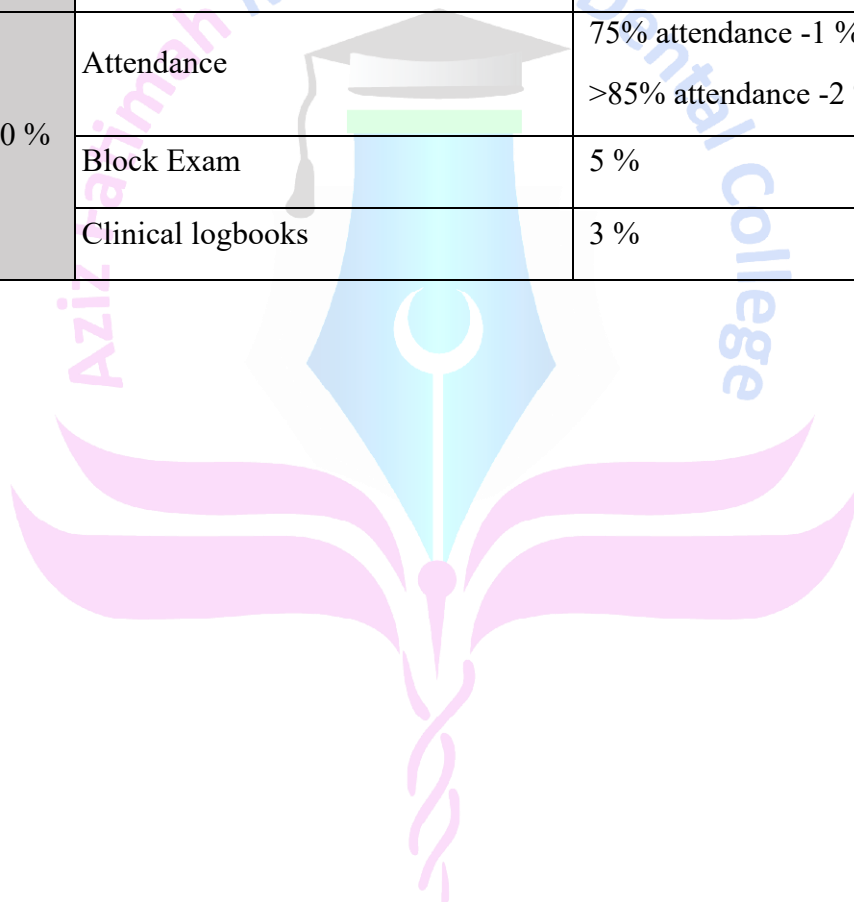
- Students must report to examination hall/ venue at least 30 minutes before the exam.
- Exam will start sharp at time.
- Late comers arriving at the examination hall more than 15 minutes after the start of the paper will not be allowed to enter the examination hall.
- All students should wear Lab coats 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.



## 12. Internal Assessment Policy (UHS)

It shall constitute 20% of the total assessment at the end of the academic year.

	Scoring Parameter	Weightage (percentage)
Theory 10 %	Attendance	75% attendance -1 %
		>85% attendance -2 %
	Block Exam	5 %
	Continuous assessment	3 %
Practical 10 %	Attendance	75% attendance -1 %
		>85% attendance -2 %
	Block Exam	5 %
	Clinical logbooks	3 %



### 13. Internal Assessment Policy by AFMDC

#### Internal Assessment Policy for Block 4 (2<sup>nd</sup> Year MBBS)

**(Theory = 10% = 35 Marks)**

#### **Block weightage (Total Marks = 18)**

##### Criteria for Block weightage

Less than 50%= 08 Marks

50%= 09 Marks

51-55%=11 Marks

56-60%=13 Marks

61-65% =14 Marks

66-70%= 15 Marks

71-75% = 16 Marks

More than 75% = 18 Marks

#### **Attendance (Total Marks = 07)**

##### Criteria for Attendance

75% Attendance = 3.5 Marks

>85 Attendance = 07 Marks

#### **Individual Subjects Weightage (Total Marks = 10)**

##### Criteria for individual subjects Weightage

Sr. No	Subject	Total Marks
1.	Anatomy	04 Marks
2.	Physiology	03 Marks
3.	Biochemistry	03 Marks

## Internal Assessment Policy for Block 4 (2<sup>nd</sup> Year MBBS)

### (Practical = 10% = 35 Marks)

#### Block weightage (Total Marks = 18)

##### Criteria for Block weightage

Less than 50%= 08 Marks

50%= 09 Marks

51-55%=11 Marks

56-60%=13 Marks

61-65% =14 Marks

66-70%= 15 Marks

71-75% = 16 Marks

More than 75% = 18 Marks

#### Attendance (Total Marks = 07)

##### Criteria for Attendance

75% Attendance = 3.5 Marks

>85 Attendance = 07 Marks

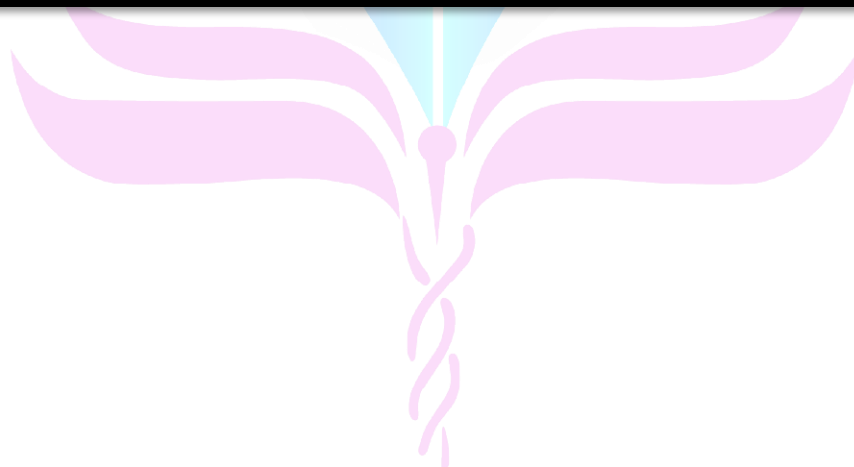
#### CFRC Log book & Portfolio Weightage (Total Marks = 10)

##### Criteria for individual subjects Weightage


Sr. No	Subject	Total Marks	Responsibility
1.	CFRC Log book	05 Marks	Block Coordinator
2.	Portfolio	05 Marks	DME

## 14. Table of Specification (TOS)

<u>MBBS 2<sup>nd</sup> Professional</u>							
<u>Block-4</u>							
Theme	Subject	Written Exam		Oral/Practical/Clinical Exam			
		MCQ (1 mark)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	38	38	04	-	01	46
Normal Function	Physiology applied/clinical	28	28	03	-	01	38
	Biochemistry applied/clinical	37	37	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	06	-	-	-	-
	Behavioral Sciences	05	05	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	16	16	01	-	-	08
	Pharmacology	10	10	01	-	-	08
CFRC	CF-2	-	-	-	01	-	05
PERLs	PERLs-2	-	-	-	01	-	05
<b>Total</b>		<b>140</b>	<b>140</b>	<b>11 stations x 08 = 88</b>	<b>02 stations x 05 = 10</b>	<b>03 stations x 14=42</b>	<b>140</b>

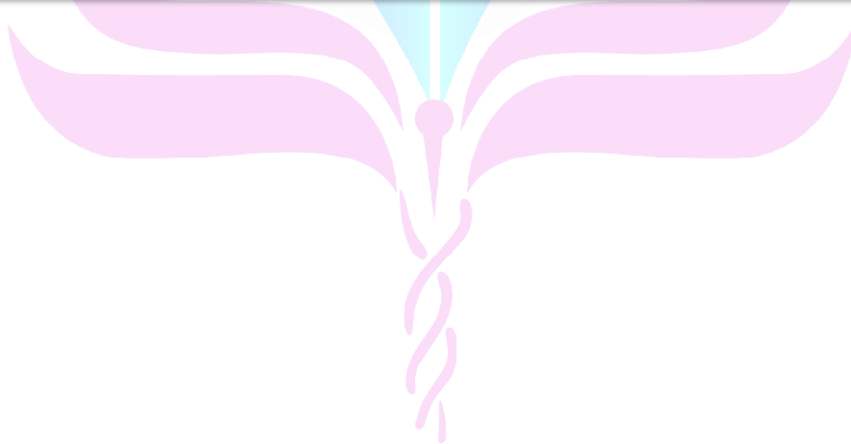


## 15. Frame work of Block-4 Module Timetable 2025-26

 <b>AZIZ FATIMAH MEDICAL &amp; DENTAL COLLEGE FAISALABAD</b>							
TIME TABLE Framework 2nd YEAR MBBS CLASS SESSION 2025-26 GIT, Nutrition and Renal Modules							
DAY	1 08:00 am - 09:30 am		2 09:30 am - 10:30 am	3 10:30 am - 11:30 am	4 11:30 am - 12:30 pm	5 12:30 pm - 13:00 pm	6 13:00 pm - 14:00 pm
Monday	Dissection		Physiology Lecture	Biochemistry Lecture	Anatomy Lecture	Namaz Break/Break	PERL's Lecture
Tuesday	Dissection		Physiology Lecture	Anatomy Lecture	Biochemistry Lecture		Pathology Lecture
Wednesday	Dissection		Physiology Lecture	Practical/SGD A: Biochemistry B: Physiology C: Anatomy			Biochemistry Lecture
Thursday	Dissection		Anatomy Lecture	Practical/SGD B: Biochemistry C: Physiology: A: Anatomy			Community Medicine Lecture
DAY	08:00 am - 09:00 am	09:00 am - 10:00 am	10:00 am - 11:00 am	11:00 am - 13:00 pm		Jummah Prayers	
Friday	Biochemistry Lecture	Anatomy Lecture	Physiology Lecture	Practical/SGD C: Biochemistry A: Physiology B: Anatomy			
DAY	08:00 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
Saturday	Dissection		Physiology Lecture	Biochemistry Lecture	Anatomy Lecture	Namaz Break/Break	BS/Pharmacology Lecture



**RESOURCE BOOKS**



## 16. Learning Resources

Anatomy	<ul style="list-style-type: none"> <li>• Snell’s Clinical Anatomy 10th ed.</li> <li>• Langman’s Medical Embryology 12th ed</li> <li>• Medical Histology by Laiq Hussain Siddiqui 8th ed.</li> <li>• General Anatomy by Laiq Hussain Siddiqui 6th ed.</li> </ul>
Physiology	<ul style="list-style-type: none"> <li>• Guyton AC and Hall JE. Textbook of Medical Physiology, W.B. Saunders &amp; Co. Philadelphia</li> <li>• Essentials of Medical Physiology by Mushtaq Ahmad</li> </ul>
Biochemistry	<ul style="list-style-type: none"> <li>• Harpers illustrated Biochemistry 32nd edition. Rodwell.V.W MCGrawHill publishers.</li> <li>• Lippincott illustrated Review 8th edition Kluwer.W.</li> <li>• Essentials of Medical Biochemistry vol 1&amp;2 by Mushtaq Ahmed.</li> </ul>
Community Medicine	<ul style="list-style-type: none"> <li>• Parks TextBook of Preventive and Social Medicine, K. Park(Editor)</li> <li>• Public Health and Community Medicine Ilyas Ansari(Editors)</li> </ul>
Pharmacology	<ul style="list-style-type: none"> <li>• Basic and clinical Pharmacology by Katzung. McGraw-Hill</li> <li>• Pharmacology by Champe and Harvey, Lippincott Williams &amp; Wilkins</li> </ul>
Pathology	<ul style="list-style-type: none"> <li>• Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.</li> <li>• Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and</li> <li>• Cotran, Pocket Companion to Pathologic basis of diseases. Saunder Harcourt.</li> <li>• Walter and Israel. General Pathology.</li> <li>• Churchill Livingstone.</li> </ul>
Medicine	<ul style="list-style-type: none"> <li>• Davidson’s Principles and Practice of Medicine</li> </ul>
Surgery	<ul style="list-style-type: none"> <li>• Bailey &amp; Love Short Practice of Surgery</li> </ul>
Islamiyat	<ul style="list-style-type: none"> <li>• Standard Islamiyat (compulsory) for B.A, B.Sc, MA, Msc, MBBS by Prof. M Sharif Islahi</li> <li>• Ilmi Islamiyat (compulsory) mfor B.A, B.sc &amp; equilent.</li> </ul>
Behavioral Sciences	<ul style="list-style-type: none"> <li>• Handbook of Behaioural Sciences by Prof. Mowadat H. Rana, 3<sup>rd</sup> Edition.</li> <li>• Medical and Psychosocial Aspects of Chronic illness and Disability Sixth Edition Donna R. Falvo, PHD Beverley E. Holland, PHD RN.</li> </ul>