





GIT & Nutrition Module – 1

Study Guide

Second Year MBBS

ISLAM MEDICAL COLLEGE

Sialkot – Pakistan

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GIT & NUTRITION
MODULE – 1
GUIDE

MODULE LEAD DETAILS

Hello, I am Dr. Rana Muhammad Zeeshan working as an Assistant Professor in Anatomy department of Islam Medical and Dental College, Sialkot and now acting as a **Module Lead of GIT & Nutrition Module – 1**. I completed my MBBS from FMH College of Medicine and Dentistry, Lahore in 2015, CHPE in 2023 from Khyber Medical University, Peshawar and MPhil Anatomy in 2024 at University of Health Sciences, Lahore. You can come to meet me in Assistant Professor office Anatomy, Academic Block 1 from 08:00 – 15:00 hours on weekdays. You can also contact me freely on my email shani3687@gmail.com.

MODULE OVERVIEW

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.

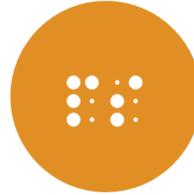
We will study in detail regarding different parts of the gastrointestinal system, their functional, embryological and histological anatomy, physiological and biochemical aspects of its functioning. Students will also be briefly introduced to clinical and pathological aspects, pharmacological interventions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

We have assigned six (6) weeks in the 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.

MODULE LEARNING 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



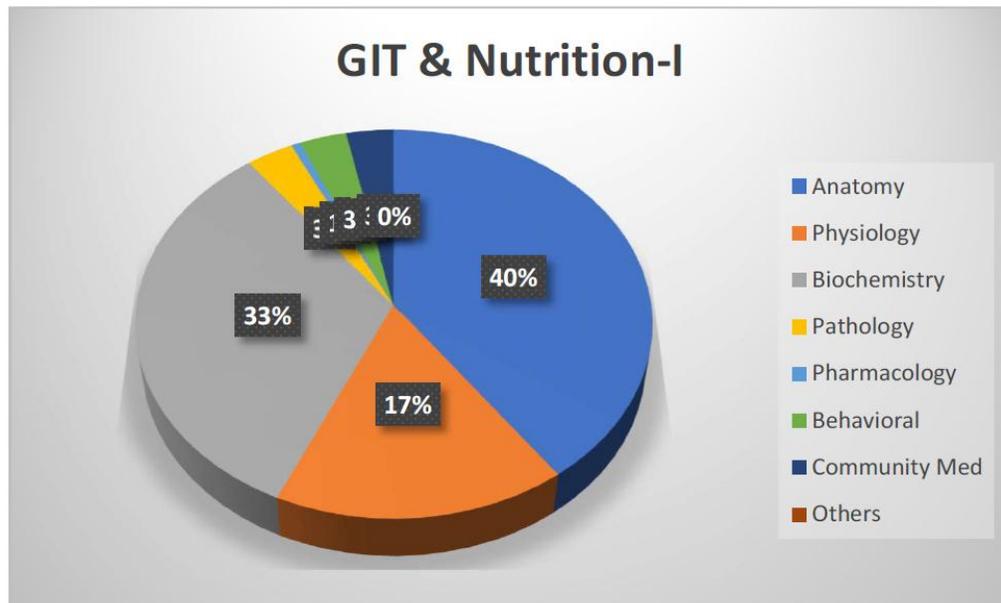
To discuss the pharmacological treatment of diarrhea and discuss the psychosocial impact of gastrointestinal diseases in society



To discuss the preventive measures related to gastrointestinal diseases and comprehend concept of balanced diet and malnutrition

MODULE SCHEDULE

Module weeks	6 weeks
Recommended minimum hours	155
Start of Module	3 rd March, 25
Last Day	18 th April, 25
Block Exam	20 th May, 25



MODULE CONTENTS

NORMAL STRUCTURE			
THEORY			
CODE	GROSS ANATOMY	TOTAL HOURS = 35	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
GIT-A-001	Describe the gross anatomical features of oral cavity with its neurovascular supply and lymphatic drainage	Human Anatomy	Oral Cavity and Oropharynx
	Discuss the location, anatomical features, relations and vascular supply of tonsils: nasopharyngeal, palatine and lingual.		
	Discuss the skeletal framework of hard palate with its neurovascular supply and lymphatic drainage		
	Describe the gross anatomical features of soft palate with its neurovascular supply and lymphatic drainage		
	Describe the attachments, nerve supply and actions of muscles of soft palate		
	Describe the structure of tongue with attachments of muscles, blood supply, nerve supply and lymphatic drainage		
	Discuss the anatomical basis of injury to hypoglossal nerve		
	Describe anatomical features, relations and neurovascular supply of parotid gland and its duct, mentioning the structures entering and exiting the gland.		
	Discuss the clinical correlates of parotid gland: parotiditis, Mumps, Frey's syndrome, parotid duct injury and parotid tumor surgery with its complications.		
	Describe the Waldeyer's ring.		
	Describe anatomical features, relations and neurovascular supply of submandibular and sublingual glands with their ducts.		
	Name the parts of pharynx giving their extent, anatomical features, structure, neurovascular supply and Lymphatic drainage		

	Name the pharyngeal constrictor muscles defining their attachments, innervation and structure traversing the gaps between adjacent muscles.		
GIT-A-002	Describe the planes and quadrants of abdomen	Human Anatomy	Anterior Abdomen Wall
	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)		
	Describe the fascia of anterior abdominal wall with its clinical significance		
	Describe anterolateral Abdominal wall arteries, Veins and Lymphatics and related clinical correlates—Caput Medusae		
	Describe the attachments, nerve supply and actions of muscles of anterior abdominal wall		
	Identify the muscles of anterolateral abdominal wall on anatomical model and/or cadaver		
	Describe the extent, formation and contents of rectus sheath		
	Give the formation and extent of inguinal ligament		
	Describe the formation of superficial and deep inguinal rings and conjoint tendon		
	Locate the position of superficial and deep inguinal rings on simulated subject or Cadaver		
	Describe the extent, boundaries and contents of inguinal canal		
	Define the following hernias: umbilical, epigastric, incisional, Spigelian, lumbar, femoral, internal and inguinal		
	Differentiate between direct and indirect inguinal hernias		
	Describe the location of abdominal surgical incisions		
	Mark the abdominal incisions on simulated patient/ subject and explain their anatomical basis		
List the structures and coverings of spermatic cord			

GIT-A-004	Trace the horizontal and vertical peritoneal reflections	Human Anatomy	Peritoneum
	Describe the relationship of viscera to the peritoneum		
	Describe the gross anatomical features of the following: 1. Mesentery 2. Omentum 3. Peritoneal ligaments 4. Peritoneal fold 5. Peritoneal sac, 6. Recesses, 7. Spaces and 8. Gutters		
	Describe the nerve supply of Peritoneum		
	Describe the anatomical basis and manifestations of the following: 1. Peritonitis and ascites 2. Peritoneal adhesions (and adhesiostomy) 3. Abdominal paracentesis		
GIT-A-005	Describe the extent of esophagus, its constrictions, neurovascular supply and lymphatic drainage Discuss the anatomical basis of esophageal varices, achalasia and Gastro Esophageal Reflux Disease (GERD)	Human Anatomy	Esophagus
GIT-A-006	Describe the location, position, parts, external and internal structure, relations, vascular and nerve supply and lymphatic drainage of stomach Draw and label a diagram illustrating the lymphatic drainage of Stomach Describe the clinical presentation and the anatomical basis and manifestations of the following conditions: Carcinoma of stomach and peptic ulcers Identify and demonstrate the parts, external and internal features of stomach on anatomical model and cadaver		
GIT-A-007	Describe the location, position, parts, relations, neurovascular supply and lymphatic drainage of duodenum, Jejunum & Ileum (Small Intestine)	Human Anatomy	Small & Large Intestine

	<p>Describe the anatomical basis and manifestations of the following conditions:</p> <ol style="list-style-type: none"> 1. Duodenal Ulcers 2. Ileal diverticulum 3. Diverticulosis 4. Large bowel cancer 5. Appendicitis 6. Volvulus 7. Intussusception 		
	Demonstrate the various positions of appendix		
	Identify and demonstrate the Parts and external features of small and large intestines on anatomical model and cadaver		
GIT-A-008	Describe the origin, course, branches (tributaries in case of veins) and distribution of the blood vessels of GIT	Human Anatomy	Liver
	Describe the formation, tributaries and drainage of hepatic-portal vein		
	Discuss the sites and vessels contributing in portosystemic anastomosis		
	Describe the clinical picture and anatomical basis for the blockage of porto-systemic anastomosis		
	Identify the blood vessels supplying GIT on anatomical model and cadaver		
	Describe location, lobes, important relations, peritoneal ligaments, blood supply, lymphatic drainage, nerve supply, related clinical correlates of liver and subphrenic spaces.	Human Anatomy	Liver
GIT-A-009	Describe components of Biliary tree- hepatic duct and bile duct	Human Anatomy	Biliary System
	Describe relations, functions, blood supply, lymphatic drainage and nerve supply of Gallbladder		
	Describe related clinical correlates- gall stones, biliary colic, cholecystectomy, gallbladder gangrene		
GIT-A-010	Describe the location, surfaces, peritoneal reflections, relations, neurovascular supply and lymphatic drainage of pancreas	Human Anatomy	Pancreas

	Describe the anatomical basis and manifestations of pancreatitis and pancreatic cancer		
	Identify the parts of the pancreas		
GIT-A-011	Describe the location, surfaces, peritoneal reflections, relations, neurovascular supply and lymphatic drainage of spleen	Human Anatomy	Spleen
	Describe the anatomical basis and manifestations of splenic trauma and splenomegaly		
	Identify the borders, surfaces and Impressions of spleen		
	Demonstrate the correct anatomical positioning of spleen		
GIT-A-012	Describe the gross anatomical features, peritoneal relations, blood supply, nerve supply and lymphatic drainage of cecum ascending and descending colon, sigmoid colon, rectum and anal canal	Human Anatomy	Sigmoid Colon, Rectum & Anal Canal
	Describe the anatomical basis for Sigmoidoscopy, rectal prolapse, rectal examination, rectal cancer and hemorrhoids		
GIT-A-013	Outline the anatomical basis and surgical treatment plan for the following diseases: <ol style="list-style-type: none"> 1. Esophageal Injuries 2. Gastric Carcinoma 3. Intestinal Obstruction 4. Pancreatic Carcinoma 5. Obstructive Jaundice 6. Gall Stones 	Human Anatomy integrated with Surgery	Surgical Intervention
GIT-A-014	Describe the fascia of posterior abdominal wall with its clinical significance	Human Anatomy	Posterior Abdomen Wall
	Describe anterolateral Abdominal wall arteries, Veins and Lymphatics and related clinical correlates		
	Describe the attachments, nerve supply and actions of muscles of posterior abdominal wall		

CODE	EMBRYOLOGY & POST-NATAL DEVELOPMENT	TOTAL HOURS = 08	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
GIT-A-015	Describe the development of tongue	Embryology	Oral Cavity
	Describe the embryological basis of tongue tie		
	Describe the development of palate		
	Describe the embryological basis of various facial clefts		
	Identify the parts of the developing tongue and palate		
GIT-A-016	Describe the formation and divisions of gut tube	Embryology	Foregut
	Describe the development of mesenteries		
	Describe the development of esophagus		
	Describe the embryological basis of esophageal atresia and/or tracheoesophageal fistula		
	Describe the development and rotation of stomach		
	Describe the embryological basis of pyloric stenosis		
	Describe the development of duodenum, liver and gall bladder		
	Describe the embryological basis of intrahepatic and extrahepatic biliary atresia		
	Describe the development of pancreas		
Describe the embryological basis of annular pancreas			
GIT-A-017	Describe the development of midgut especially mentioning physiological herniation, rotation, retraction of herniated loops and mesenteries of the intestinal loops	Embryology	Midgut
	Describe the embryological basis of the following <ul style="list-style-type: none"> 1. mobile cecum 2. volvulus 3. retro colic hernia 4. Omphalocele 5. gastroschisis 		
	Describe the embryological basis of Meckel's diverticulum		
	Describe the embryological basis of; <ul style="list-style-type: none"> 1. Gut rotation defects 2. Gut atresia and stenosis 		

GIT-A-018	Describe the development of hindgut	Embryology	Hindgut
	Describe the embryological basis of; 3. Rectourethral and rectovaginal fistulas 4. Recto anal fistulas and atresia 5. Imperforate anus 6. Congenital megacolon		
	Identify the parts of the developing foregut, midgut and hindgut originating from the endoderm		
CODE	MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)	TOTAL HOURS = 07	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
GIT-A-019	Describe the light microscopic structure of; 1. Lips 2. Tongue including lingual papillae and taste buds 3. Oral Cavity (Cheeks, Teeth gums, hard & Soft palate) Describe the histological structure of parotid, submandibular and sublingual glands. Compare and contrast the histological structures of parotid, submandibular and sublingual glands.	Histology	Oral Cavity & Esophagus
	Describe the serous and mucous acini and give histological differences between the two. Describe the structure and location of serous demilunes. Describe histology of oropharynx		
	Relate the characteristics of various layers of GIT with their function		
	Describe the light microscopic structure of esophagus		
	Tabulate the histological differences between different parts of esophagus		
	Describe the histological changes associated with reflux esophagitis and Barrett's esophagus		
GIT-A-020	Describe the light microscopic structure of stomach	Histology	Stomach

	Describe the role of parietal cells in pernicious anemia		
GIT-A-021	Describe the light microscopic structure of 1. Duodenum 2. Jejunum 3. Ileum	Histology	Small Intestine
	Discuss the histological basis of celiac disease		
	Discuss the histological basis of Crohn's disease		
GIT-A-022	Describe the light microscopic structure of 1. Colon 2. Appendix 3. Rectum Define colorectal cancer, anal abscess, hemorrhoids	Histology	Large Intestine
PRACTICAL 			
CODE	HISTOLOGY		TOTAL HOURS = 12
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
GIT-A-023	Identify, draw and label the histological sections of Tongue and Lips and enumerate points of identification	Histology Practical	Oral Cavity
GIT-A-024	Identify, draw and label the histological sections of Salivary glands (Submandibular, Sublingual and Parotid)	Histology Practical	Salivary Gland
GIT-A-025	Identify, draw and label the histological structure of the esophagus and enumerate points of identification	Histology Practical	Upper GIT
	Identify, draw and label the histological structure of stomach and enumerate points of identification		
GIT-A-026	Identify, draw and label the histological structure of small intestine (Duodenum, Jejunum, and Ileum) and enumerate points of identification	Histology Practical	Small Intestine
GIT-A-027	Identify, draw and label the histological structure of large intestine and enumerate points of identification	Histology Practical	Large Intestine
GIT-A-028	Identify, draw and label the histological sections of Gall bladder, liver and enumerate points of identification	Histology Practical	Organs associated with GIT

	Identify, draw and label the histological sections of pancreas and enumerate points of identification	Histology Practical	Organs associated with GIT
GIT-A-029	Identify, draw and label the histological sections of Palatine tonsil, appendix, peyer's patches and enumerate points of identification	Histology Practical	Lymphatic tissue associated with GIT
NORMAL FUNCTION			
THEORY			
CODE	MEDICAL PHYSIOLOGY	TOTAL HOURS = 20	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
GIT-P-001	Classify the components of enteric nervous system	Medical Physiology	General Principles of GIT Function - Motility, Nervous Control & Blood Flow
	Discuss the location and significance of myenteric plexus		
	Describe the Meissner's plexus		
	Differentiate between myenteric and Meissner's plexuses		
	Explain the mechanism of developing slow wave		
	Explain the mechanism of developing spike potential		
	Enlist the factors that depolarize & hyperpolarize the GIT membrane		
	Enlist the excitatory & inhibitory neurotransmitters of enteric nervous system		
	Explain the role of sympathetic & parasympathetic nervous system in controlling GIT function.		
	Enlist the gastrointestinal reflexes & explain the functions of these reflexes		
	Enlist the hormones acting on GIT, their stimuli, site of release and actions		
	Enumerate different types of movements that occur in GIT		
	Discuss the functions and control of GIT movements		
Discuss the effect of gut activity and metabolic factors on GIT blood flow / Splanchnic circulation			
Explain the nervous control of GIT blood flow / Splanchnic circulation			
GIT-P-002	Trace the reflex arc of mastication		Oral Cavity &

	Explain the process and importance of chewing reflex	Medical Physiology	Esophagus
	Enlist the stages of swallowing		
	Describe the mechanism of voluntary stage of swallowing		
	Trace the reflex arc of involuntary stage of swallowing		
	Enlist the steps involved in involuntary stage of swallowing	Medical Physiology	
	Explain the effect of swallowing on respiration	Medical Physiology	
	Discuss the mechanism of esophageal stage of swallowing	Medical Physiology	
	Enlist causes of dysphagia	Medical Physiology integrates with Surgery	
	Explain the types and role of different peristalsis originating in esophagus	Medical Physiology	
	Discuss the role of Lower Esophageal Sphincter (Gastroesophageal)	Medical Physiology	
	Discuss the pathophysiology of achalasia & Megaesophagus	Medical Physiology	
	Enlist the features and treatment of achalasia	Medical Physiology	
GIT-P-003	Explain storage function of stomach	Medical Physiology	Stomach
	Describe the basic electrical rhythm of stomach wall	Medical Physiology	
	Explain the role of pyloric pump and pyloric sphincter in gastric emptying	Medical Physiology	
	Explain the factors that promote Stomach Emptying	Medical Physiology	
	Discuss the duodenal (nervous & hormonal) factors that inhibit Stomach emptying	Medical Physiology	
	Enlist the factors that initiate enterogastric inhibitory reflexes	Medical Physiology	
	Enumerate the causes, features, and pathophysiology of gastritis	Medical Physiology integrates with Medicine	
	Explain the physiological basis of each feature of gastritis	Medical Physiology integrates with	

		Medicine	
	Recommend treatment of gastritis		
	Enumerate the causes, features, and pathophysiology of peptic ulcer	Medical Physiology integrates with Medicine	
	Explain the physiological basis of each feature of peptic ulcer		
GIT-P-004	Enumerate and explain the secretions and movements of small intestine	Medical Physiology	Small Intestine
	Explain the term "peristaltic rush"		
	Explain the functions of ileocecal valve and sphincter		
	Enumerate the types of intestinal sprue	Medical Physiology integrates with Medicine	
	Enlist the features of intestinal sprue		
	Explain the consequences of sprue on the body		
GIT-P-005	Enumerate the types of movements taking place in colon	Medical Physiology	Large Intestine
	Explain the mechanism of developing movements of colon and their control through Gastrocolic and Duodenocolic Reflexes	Medical Physiology	
	Enlist the defecation reflexes	Medical Physiology	
	Explain the mechanism of defecation reflex	Medical Physiology	
	Trace the reflex arc of defecation	Medical Physiology	
	Name the other autonomic reflexes that affect bowel activity	Medical Physiology	
	Explain the pathophysiology of constipation	Medical Physiology integrates with Medicine	
	Discuss the causes of diarrhea		
	Describe the cause of Hirschsprung's disease integrate with Medicine	Medical Physiology	
GIT-P-006	Explain the functions of liver	Medical Physiology	Liver
	Differentiate between liver and gall bladder bile and the hormones acting on them	Medical Physiology	

	Enumerate the causes and composition of developing gall stones	Medical Physiology Integrate with Surgery	
GIT-P-007	Explain function and secretions of pancreas	Medical Physiology	Pancreas
	Enlist the causes and pathophysiology of acute and chronic pancreatitis	Integrate with Medicine	
	Enumerate the features of acute pancreatitis and explain the physiological basis of each feature of pancreatitis	Integrate with Medicine	
GIT-P-008	Describe the stages of vomiting act	Medical Physiology	Vomiting Reflex
	Trace the reflex arc of vomiting	Medical Physiology	
	Explain the role of chemoreceptor trigger zone for initiation of vomiting by drugs or by motion sickness	Medical Physiology	
GIT-P-009	Define Acute Diarrhea	Integrated with Medicine Gastroenterology	Acute & Chronic Diarrhea
	Define Chronic Diarrhea		
	Enlist various causes for acute and chronic diarrhea		
CODE	BIOCHEMISTRY		TOTAL HOURS = 40
	SPECIFIC LEARNING OBJECTIVES		DISCIPLINE
GIT-B-001	Give the composition and importance of saliva and related clinical disorder (xerostomia)	Biochemistry	Biochemistry of GIT /GIT secretions & digestion and absorption of dietary carbohydrates
	Give the composition and importance of gastric juice with special reference to mechanism of HCl secretion and related clinical disorders (achlorhydria, gastric ulcer		
	Give the composition and importance of pancreatic juice, bile and succus entericus and related clinical disorders (pancreatitis, cystic fibrosis, cholelithiasis).		
	Describe digestion and absorption of dietary carbohydrates along with inherited and acquired disorders (lactose intolerance, sucrase-isomaltase deficiency).		
GIT-B-002	Elaborate key features of various transport systems for entry of glucose into cells.	Biochemistry	Carbohydrate metabolism/ Entry of glucose into cells

GIT-B-003	Enlist the hormones that play important roles in regulating carbohydrate metabolism.	Biochemistry	Carbohydrate metabolism/ Hormonal control of BSL
	Elaborate the metabolic effects of these hormones.		
	Infer the consequences of deficiency and excess of these hormones		
GIT-B-004	Describe the glycolytic pathway along with its regulation and significance.	Biochemistry	Carbohydrate metabolism/ Glycolysis
	Compare key features of aerobic and anaerobic glycolysis.		
	Calculate the number of ATP produced during aerobic and anaerobic glycolysis.		
	Explain hemolytic anemia in subjects with pyruvate kinase deficiency based on your biochemical knowledge.		
	Clearly differentiate between substrate level phosphorylation and oxidative phosphorylation.		
GIT-B-005	Discuss the metabolic fates of pyruvate.	Biochemistry	Carbohydrate metabolism/ Metabolic fates of pyruvate
	Describe the transport of pyruvate from cytosol to mitochondria.		
	Elaborate the reaction catalyzed by pyruvate dehydrogenase complex (PDH) along with regulation and significance.		
	Enlist inherited and acquired causes of lactic acidosis and give biochemical explanation for lactic acidosis in each condition.		
GIT-B-006	Describe the TCA cycle along with regulation & significance. Calculate the energy yield of TCA	Biochemistry	Carbohydrate metabolism/ Kreb's Cycle
GIT-B-007	Define gluconeogenesis and enumerate gluconeogenic substrates (precursors)	Biochemistry	Carbohydrate metabolism/ Gluconeogenesis
	Delineate the reactions involved in synthesis of glucose from various gluconeogenic substrates.		
	Elaborate the regulation and importance of gluconeogenesis.		

	Explain the significance of Cori cycle and glucosealanine cycle		
GIT-B-008	Illustrate the reactions of glycogenesis, glycogenolysis along with their regulation and significance	Biochemistry	Carbohydrate metabolism/ Glycogen metabolism
	Enlist various types of glycogen storage diseases (GSDs)		
	Infer the key biochemical and clinical features of various GSDs from the respective enzyme deficiencies.		
GIT-B-009	Describe the reactions and regulation of Hexose Mono Phosphate Pathway (HMP).	Biochemistry	Carbohydrate metabolism/ HMP Hexose Monophosphate Pathway
	Discuss the importance of HMP shunt		
	Explain hemolytic anemia in subjects suffering from G6PD deficiency.		
	Diagnose G6PD (glucose-6-phosphate dehydrogenase) deficiency based on given data.		
GIT-B-010	Describe the reactions, regulation, and biomedical importance of uronic acid pathway and sorbitol pathway	Biochemistry	Carbohydrate metabolism/ Uronic acid pathway & sorbitol pathway
GIT-B-011	Outline the reactions involved in ethanol metabolism.	Biochemistry	Carbohydrate metabolism/ Ethanol metabolism
	Explain how ethanol consumption causes hypoglycemia and fatty liver.		
GIT-B-012	Diagrammatically illustrate the organization of electron transport chain (ETC) depicting the flow of electrons	Biochemistry	Respiratory chain & oxidative phosphorylation /ETC
	Enlist the components of complex I, II, III, and IV		
	Enumerate clinically important inhibitors of electron transport chain and mention their site of action.		
GIT-B-013	Elaborate the structure of ATP synthase (complex V).	Biochemistry	Respiratory chain & oxidative phosphorylation /ATP synthesis
	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)		
	Elaborate the effect of oligomycin and uncouplers on ATP production.		
	Describe the effect of arsenic poisoning on carbohydrate metabolism and ATP production.		

	Elaborate the glycerol 3-P shuttle and malate-aspartate shuttle for the transfer of reducing equivalents from cytosol into the mitochondria.		
GIT-B-014	Define and classify nutrients into macro and micronutrients.	Biochemistry	Nutrition/ Balanced diet
	Elaborate the concept and importance of Balanced Diet		
	Enlist the components of balanced diet and elaborate the importance of each component.		
GIT-B-015	Delineate special nutritional requirements during pregnancy, lactation, growth, and old age.	Integrate with Community Medicine	Nutrition/ Special nutritional requirements
	Suggest dietary advice for patients suffering from diabetes mellitus, hypertension, obesity, renal disease, lactose intolerance, gluten enteropathy, hypercholesterolemia, and hemorrhoids.		
GIT-B-016	Enlist causes and types of Protein Energy Malnutrition (PEM).	Integrate with community Medicine/ Pediatrics	Nutrition/ PEM
	Differentiate between Kwashiorkor and Marasmus based on the given data		
	Enlist symptoms and signs Outline treatment strategies		
GIT-B-017	Define energy balance.	Biochemistry	Nutrition/ Caloric requirements
	Compare the energy content of macro nutrients and alcohol.		
	Suggest a simple method for estimation of caloric requirements of sedentary adults, moderately active adults, and very active adults		
GIT-B-018	Define basal metabolic rate (BMR)	Biochemistry	Nutrition/ BMR
	Elaborate the effect of various physiological and pathological factors on BMR.		
GIT-B-019	Define body mass index (BMI).	Integrate with community Medicine	Nutrition/ BMI & Obesity
	Categorize individuals into underweight, normal, overweight, obese, and morbidly obese based on their BMI values.		

	Elaborate the role of genetic, environmental, and behavioral factors in determining body weight.		
	Clearly differentiate between upper body obesity and lower body obesity.		
	Enlist health risks associated with obesity.		
GIT-B-020	Define Marasmus and Kwashiorkor	Integrated with Pediatrics	Malnutrition
	Define Malnutrition Identify various causes of malnutrition Identify the risk factors of malnutrition Outline treatment strategies	Integrated with Medicine Gastroenterology	

PRACTICAL

CODE	BIOCHEMISTRY	TOTAL HOURS = 11+06	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
GIT-B-021	Estimate blood glucose level by glucose oxidase method and interpret the results	Biochemistry Practical	Estimations of blood/urine analytes
	Determine blood glucose level by glucometer and interpret the result.		
	Interpret the graphs related to GCT and GTT		
	Determine urine glucose by dipstick method and by chemical method and interpret the result.		
	Estimate serum amylase and interpret the result.		
GIT-B-022	Calculate BMI of given subject and interpret the results.		Interpretation of results
GIT-B-023	Demonstrate Cranial nerve V, IX & X testing	Physiology	Cranial nerve

AGING

CODE	THEORY	TOTAL HOURS = 01	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
GIT-CM-001	Identify causes and risk factors for malnutrition in elderly		

	Outline treatment strategies	Community Medicine	Preventive Medicine in Geriatrics
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PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 05	
		DISCIPLINE	TOPIC
GIT-Ph-001	Classify anti diarrheal drugs and describe the pharmacokinetics, mechanism of action, pharmacological effects, uses and adverse effects	Pharmacology	Anti Diarrheal Drugs
GIT-Pa-001	Define gastritis. Enlist the types of gastritis Describe the morphological features of gastritis	Pathology	Gastritis
GIT-Pa-002	Describe the salient feature of peptic ulcer disease Discuss the role of H. Pylori in causing peptic ulcer disease	Pathology	Peptic Ulcer
GIT-Pa-003	Enumerate common infectious agents of diarrheal diseases Discuss pathogenesis and clinical features of common pathogens	Microbiology	

PRACTICAL

CODE	PATHOLOGY	TOTAL HOURS = 01	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
GIT-Pa-004	Describe salient features of acute & chronic gastritis	Pathology	Gastritis

DISEASE PREVENTION & IMPACT

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 09	
		DISCIPLINE	TOPIC
GIT-BhS-001	Identify health related behaviors and apply principles of learning to modify eating and addictive patterns	Behavioral Sciences	Health related behaviors
GIT-BhS-002	Discuss health belief model and its application in managing common presentations related to gastro-intestinal system		Health related believes

	Explain the transtheoretical model of changing behaviors to modify the diseases pattern		
GIT-BhS-003	Describe motivational interviewing and outline a management plan to help the individuals with obesity and diabetes to lose weight		Management of Obesity
GIT-BhS-004	Describe and distinguish Medically Un described Symptoms (MUS)		Medically Un described Symptoms
	Describe the association of psychosocial factors with MUS		
	Outline the principles of management plan according to biopsychosocial model		
	Describe role of Cognitive Behavioral Therapy (CBT)		
GIT-BhS-005	To identify effect on mental development of nutritional deficiencies		Role of nutritional deficiencies in mental development
GIT-CM-001	Describe prevention and control of polio, viral hepatitis A, cholera, typhoid and food poisoning	Community Medicine	Epidemiology of communicable diseases (Intestinal infection)
	Describe prevention and control of amoebiasis, ascariasis, hook worm infestation		
GIT-CM-002	Describe the advice to be given for breast feeding, weaning and childhood		Preventive medicine in pediatrics
	Discuss risk factors, prevention and management of protein energy malnutrition (PEM)		
GIT-CM-003	Describe balanced diet for adult and obesity		Nutrition & Health
	Plot and interpret growth chart for children under 5 years of age		
	Describe prevention and control of deficiency of Vitamin A and D		

WEEKLY TIMETABLES

GIT Module Schedule (2 nd Year MBBS)							
WEEK- 01/06							
Day/Date	8:30 - 09:10	09:10 - 10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40
Monday	Quran/Pak Studies	Biochem LGIS	Embryo LGIS	Physio LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break
Tuesday	Anat Dissection		Biochem LGIS	Embryo LGIS	Practical (Anat, Bio, SDL)		
Wednesday			Physio LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)		
Thursday	Anat Dissection		Gross LGIS	10:50-11:40	11:40-12:30	12:30-1:10	
Friday			8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	
	Anat Dissection		Histo LGIS	Biochem LGIS	Physio LGIS	Com Med LGIS	
							1:40-2:20 2:20-3:00
							PERLs
							1:40 - 3:00
							SGD (Physio/Bio)

WEEK- 02/06							
Day/Date	8:30 - 09:10	09:10 - 10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40
Monday	Quran/Pak Studies	Biochem LGIS	Embryo LGIS	Physio LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break
Tuesday	Anat Dissection		Biochem LGIS	Embryo LGIS	Practical (Anat, Bio, SDL)		
Wednesday			Physio LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)		
Thursday	Anat Dissection		Gross LGIS	10:50-11:40	11:40-12:30	12:30-1:10	
Friday			8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	
	Anat Dissection		Histo LGIS	Biochem LGIS	Physio LGIS	Patho LGIS	
							1:40-2:20 2:20-3:00
							PERLs
							1:40 - 3:00
							SGD (Physio/Bio)

WEEK- 03/06								
Day/Date	8:30 - 09:10	09:10 - 10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00
Monday	Quran/Pak Studies	Biochem LGIS	Embryo LGIS	Physio LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break	SGD (Physio/Bio)
Tuesday	Anat Dissection		Biochem LGIS	Embryo LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
Wednesday	Anat Dissection		Physio LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
Thursday	Anat Dissection		Gross LGIS	10:50-11:40 Biochem LGIS	11:40-12:30 Physio LGIS	12:30-1:10 Com Med LGIS		1:40-2:20 2:20-3:00
Friday	8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	12:30-1:10			PERLs
	Anat Dissection		Histo LGIS	Biochem LGIS	Physio LGIS	Patho LGIS	1:40 - 3:00	SGD (Physio/Bio)

WEEK- 04/06								
Day/Date	8:30 - 09:10	09:10 - 10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00
Monday	Quran/Pak Studies	Biochem LGIS	Embryo LGIS	Physio LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break	SGD (Physio/Bio)
Tuesday	Anat Dissection		Biochem LGIS	Embryo LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
Wednesday	Anat Dissection		Physio LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
Thursday	Anat Dissection		Gross LGIS	10:50-11:40 Biochem LGIS	11:40-12:30 Physio LGIS	12:30-1:10 Com Med LGIS		1:40-2:20 2:20-3:00
Friday	8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	12:30-1:10			PERLs
	Anat Dissection		Histo LGIS	Biochem LGIS	Physio LGIS	Pharma LGIS	1:40 - 3:00	SGD (Physio/Bio)

WEEK- 05/06									
Day/Date	8:30 - 09:10	09:10 - 10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00	
Monday	Quran/Pak Studies	Biochem LGIS	Embryo LGIS	Medicine C-FRC	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break	SGD (Physio/Bio)	
Tuesday	Anat Dissection		Biochem LGIS	Histo LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)	
Wednesday	Anat Dissection		Gross LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)	
Thursday	Anat Dissection		Gross LGIS	10:50-11:40	11:40-12:30	12:30-1:10		1:40-2:20	2:20-3:00
Friday	8:30-9:30		9:30-10:30	Biochem LGIS	Surgery LGIS	Beh LGIS		PERLs	
	Anat Dissection		Histo LGIS	Biochem LGIS	Medicine C-FRC	Com Med LGIS		1:40 - 3:00	
								SGD (Physio/Bio)	

WEEK- 06/06									
Day/Date	8:30 - 09:10	09:10 - 10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00	
Monday	Quran/Pak Studies	Biochem LGIS	Embryo LGIS	Beh LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break	SGD (Physio/Bio)	
Tuesday	Anat Dissection		Biochem LGIS	Histo LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)	
Wednesday	Anat Dissection		Gross LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)	
Thursday	Anat Dissection		Gross LGIS	10:50-11:40	11:40-12:30	12:30-1:10		1:40-2:20	2:20-3:00
Friday	8:30-9:30		9:30-10:30	Biochem LGIS	11:30-12:30	12:30-1:10		PERLs	
	Anat Dissection		Histo LGIS	Biochem LGIS	Medicine C-FRC	Com Med LGIS		1:40 - 3:00	
								SGD (Physio/Bio)	

ASSESSMENT TOOLS

Students will be assessed by the following methods

1. Fortnightly Assessments

Fortnightly assessments will be conducted on Monday.

2. Assignments/ PBLs:

Assignments /PBLs will be given monthly.

3. Block exam:

At the end of block an exam will be conducted comprising of theory (MCQs & SEQs) and practical/ OSPE content.

4. Departmental quizzes, presentations & group projects:

Above mentioned can be the assessment tools for different departments on their will.

YEAR-2						
Block 4 Modules (GIT & Nutrition-I + Renal-I)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Part II SEQs (10)	50 Marks				
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	175	Total	175		
Block 5 Modules (Endocrinology & Reproduction-I +	Part I MCQs (90)	90Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Part II SEQs (10)	50Marks				
	Internal Assessment 10% 35 Marks Internal Assessment 10% 35 Marks					

Demotivated *Q* 239 *Q* *Q*

Head& Neck, Special Senses)	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	175	Total	175		
Block 6 Modules (Neurosciences-I + Inflammation)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Part II SEQs (10)	50 Marks				
	Internal Assessment	35 Marks	Internal Assessment	35 Marks		
	Total	175	Total	175		
Total Marks:					1050	
Islamic Studies/ Civics and Pakistan Studies	Islamic Studies/Civics 3 LEQs of 20 marks each		60 Marks		100*	
	Pakistan Studies 2 LEQs of 20 marks each		40 Marks			
	Total		100			

MBBS 2nd Professional Block- 4

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	23	03	38	04	-	01	46
Normal Function	Physiology applied/clinical	18	02	28	03	-	01	38
	Biochemistry applied/clinical	22	03	37	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	-	06	-	-	-	-
	Behavioral Sciences	05	-	05	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	11	01	16	01	-	-	08
	Pharmacology	05	01	10	01	-	-	08
CFRC	CF-2	-	-	-	-	01	-	05
PERLs	PERLs-2	-	-	-	-	01	-	05
Total		90	10x5=50	140	11 stations x 08 = 88	02 stations x 05 = 10	03 stations x 14=42	140

RECOMMENDED SOURCES

Anatomy

- Snell's Clinical Anatomy 10th ed.
- Langman's Medical Embryology 12th ed
- Medical Histology by Laiq Hussain Siddiqui 8th edition.
- General Anatomy by Laiq Hussain Siddiqui 6th edition.

Biochemistry

- Harpers illustrated Biochemistry (latest edition). Rodwell.V.W MCGrawHill publishers.
- Lippincott illustrated Review (latest edition). Kluwer.W.
- Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.

Pathology

- Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.
- Robbins and Cotran Pathological Basis of Disease. Kumar, V., Abbas, A. and Aster, J. Latest Edition
- Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pocket
- Companion to Pathologic basis of diseases, Saunder Harcourt.
- Walter and Israel. General Pathology. Churchill Livingstone.
- Robbins & Kumar, Medical Microbiology and Immunology Levinson.

General Medicine

- Principles and Practice of Medicine by Davidson (latest edition)
- Clinical Medicine by Parveen J Kumar & Michael Clark
- Oxford Handbook of Medicine
- Macleod's Clinical Examination book
- Medicine and Toxicology by C.K. Parikh
- Hutchison's Clinical Methods by Michael Swash. 21st edition

Pharmacology And Therapeutics

- Katzung and Trevor's Pharmacology: Examination and Board Review- 15th Edition
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 16th Edition-
- Current Medical Diagnosis and Treatment- reference book –Edition-2024
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 15th Edition
- Basic and Clinical Pharmacology by Katzung, McGraw-Hill. 16th Edition.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins 8th Edition.
- Katzung Basic and Clinical pharmacology, Lippincot Illustated reviews.
- Clinical Pathology Interpretations by A. H. Nagi

Behavioural Sciences

- Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition
- Medical and Psychosocial aspects of chronic illness and disability 6th edition by Donna R.Falvo and Beverly E.Holland,
- Integrating behavioral sciences in healthcare, Asma Humayun,2003, 1st edition

Community medicine

- Parks Textbook of Preventive and Social Medicine. K. Park
- Public Health and Community Medicine by Ilyas Ansari
- MSDS manual of Government of Punjab
- Text book of Community Medicine by Park J E. Latest Edition

Surgery

- Bailey & Love's Short Practice of Surgery (latest edition)
- Browse's Introduction to the Symptoms & Signs of Surgical Disease 4th Edition
- Bailey & Love Short Practice of Surgery, Clinical Surgery pearls by Dayananda Babu RACS for Surgical Audits.

Patient Safety

- Patient Safety Curriculum Guide: Multi Professional Guide

Microbiology

- Levinson's review of Microbiology
- Medical Microbiology and Immunology by Levinson and Jawetz

Pediatrics Medicine

- Nelson Textbook of Pediatrics
- Basis of Pediatrics by Pervez Akbar Khan

Gynecology

- Gynecology by Ten Teachers

Infection Control

- National Guidelines Infection Prevention and control, National Institute of Health Pakistan Biosafety
- Biosafety in Microbiological and Biomedical Laboratories, 6th Edition (CDC, USA)
- WHO Laboratory Biosafety Manual, Fourth Edition, And Associated Monographs
- WHO safe management of wastes from healthcare facilities chapter 7 -8 page 77-99, 105-125)

Family medicine

- Oxford Handbook of General Practice, 5th Edition

Orthopedics

- Apley and Solomon's System of Orthopaedics and Trauma by Ashley Blom (Editor) Rheumatology
- Davidson's Principles and Practice of Medicine
- Clinical Medicine by Parveen J Kumar & Michael, Clark

- Hutchison's Clinical Methods by Michael Swash

Radiology

- Aids to Radiological Differential Diagnosis by Chapman S. and Nakielny R. 4th edition. Elsevier Science Limited; 2003.

Forensic Medicine

- Knight's Forensic Pathology by Barnard Knight 3rd edition
- G. Principles and Practice of Forensic Medicine by Prof. Nasib R. Awan, 2nd edition
- Forensic DNA Typing – 2nd Edition, Author: John M. Butler
- Parikh's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology by C.K. Parikh 6th Ed., CBS Publisher.
- Gun Shot Wounds 2nd edition by V.J.Deimaio
- Knight B. Simpson's Forensic Medicine.
- Knight and Pekka. Principles of Forensic Medicine

Forensic Pathology

- Forensic pathology 2nd edition by V.J.Deimaio CRC press Boca Raton London New York Washington DC

Toxicology

- Principles of clinical toxicology 3rd edition Thomas . Gossel CRC press Taylor and Francis group

Forensic Sciences

- Fundamentals of Forensic Science- 3rd Edition: Author: Max M Houck, Jay A. Siegel
- Text Book of forensic medicine and toxicology Principles and Practice 5th edition by Krishan Vig

Biomedical ethics

- Principles of Biomedical ethics, 8th edition by Tom. L. Beauchamp, James F. Childress.

Evidence Based Medicine

- Databases for the latest articles/manuscripts
- Clinical Practice Guidelines- local and international - (within last 3 years)
- Books (Latest edition-within last 5 years)

Pediatrics

- Nelson's Book of Pediatric 22 edition Illustrated book of Pediatrics, Pervaiz Akbar textbook pediatrics medicine

Islamiyat

- Standard Islamiyat (compulsory) for B.A, BSc, MA, MSc, MBBS by Prof M Sharif Islahi.
- Ilmi Islamiyat(compulsory) for BA, BSc & equivalent.

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IMPORTANT NOTE

To be able to sit in Annual Exam

**85 % attendance and at least 50 % in internal
assessment is mandatory**

DISCLAIMER

This module guide may be subject to changes, and students should stay updated through official communication channels