

Jordan University of Science and Technology

Faculty of Medicine 2018-2019

COURSE TITLE: Gastrointestinal System.

COURSE CODE: MED 311.

CREDIT HOURS: 6 CREDIT HOURS

SEQUENCE: YEAR 3

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Course Description:

This interdisciplinary integrative course explores fundamental concepts of biochemistry, anatomy, histology, physiology, nutrition and public health problems, pathology, pharmacology, and microbiology as they relate to issues and common diseases of gastrointestinal (GI) and hepatobiliary system. Clinical and therapeutic management of common GI problems are also explored. Teaching methods include lectures, small group discussions, and labs. The practical part of the course emphasizes the anatomy, pathology, and microbiology of the GI tract giving students the opportunity to expose their knowledge for discussion and confirm concepts learned in lectures. Small group discussions of common clinical problems at the end of the course are part of the teaching strategy of this module to enhance integration of basic sciences and clinical knowledge and students' self-directed learning. Various research activities will be conducted by students in pre-specified topics to increase their awareness of the current concepts and novel developments in the field of GI medicine and to emphasize social responsibility and community service.

Course Learning Outcomes

1. Describe the gross structure and functional anatomy of each GI tract organ.
2. Recognize the microscopic appearance of different parts of the GI tract.
3. Understand the normal embryology and development of different parts of the GI tract with their congenital abnormalities.
4. Describe the function of each GI tract structure.
5. Explain how neuronal and hormonal mechanisms regulate GI tract, pancreatic, and biliary functions.
6. Describe the major types of nutrients and how they are digested and absorbed.
7. Identify and describe the major disease processes including neoplasms and malabsorption conditions affecting different organs of the GI tract in terms of pathogenesis, gross and microscopic changes, manifestations, and complications and management.
8. Identify various bacterial, viral, fungal, and parasitic infections affecting the GI tract, and describe the principle manifestations, diagnosis, treatment, and prevention of each individual microorganism and parasitic agent affecting it.
9. Describe the mechanisms of action, pharmacokinetics, indications, and adverse effects of the commonly used drugs in the treatment of GI tract disorders (vomiting, peptic ulcer disease, fatty liver disease, constipation, and diarrhea).
10. Describe the essential nutritional requirement, body weight and energy balance, nutritional deficiencies, and nutrition-related diseases.
11. Understand the clinical differences in the toxic effect of drugs on the liver and the management of some important cases of drug-induced liver injury.

Recommended Textbooks and Atlases:

Subject	Book (Resources)
Anatomy	<ol style="list-style-type: none"> 1. Gray's anatomy for students, Drake, Vogl, Mitchell 2. Clinical Anatomy for Medical Students. By R. S. Snell, Latest Edition. 3. Grants Atlas of Anatomy or any other Atlas of Human Anatomy. 4. Basic Histology. By L. Carlos Junqueira, Latest Edition. 5. Before we are born. By K. L. Morre and T. V. N. Persuade, latest edition. 6. Langman's medical embryology 7. Color textbook of histology Gartner and Hiatt
Physiology	<ul style="list-style-type: none"> • Textbook of Medical physiology. By Guyton and Hall, Latest Edition.
Biochemistry	<ul style="list-style-type: none"> • Delvin: Textbook of Biochemistry with Clinical correlations.
Pathology	<ul style="list-style-type: none"> • Basic Pathology. By Kumar, Cotran, and Robbins, Latest Edition.
Pharmacology	<ol style="list-style-type: none"> 1. Lippincott's Illustrated Reviews: Pharmacology, Latest Edition. 2. Goodman and Gilman's: The pharmacological basis of therapeutics, Latest Edition. 3. Basis and Clinical Pharmacology B.G. Katzung Latest Edition. 4. Pharmacology Rang, Dale, Ritter and Moore Latest Edition.
Microbiology	<ul style="list-style-type: none"> • Sherris medical microbiology an introduction to infectious diseases, Latest Edition.
Public Health	<ul style="list-style-type: none"> • Supplementary Departmental handouts.
Clinical Lectures	<ul style="list-style-type: none"> • To be assigned by the lecturer.

Learning Objectives

(A) Lectures objectives

Lecture Title	Lecture Objectives
The Oral Cavity and Salivary Glands (Anatomy) 1	<ol style="list-style-type: none"> 1. Describe different parts of the oral cavity and their boundaries 2. Describe the gross anatomy of the tongue, palate, teeth and gum 3. Identify different muscles that contribute to the formation of the tongue, their innervations and actions. 4. Identify different types of tongue papillae and describe their structure and distribution 5. Describe briefly the anatomy and location of the three major salivary glands
Salivary secretion, swallowing and esophageal motility (Physiology) 2	<ol style="list-style-type: none"> 1. Describe the physiological role of various salivary glands. 2. Describe the components and functions of saliva. 3. Describe the neural regulation of salivary secretion. 4. Predict the components of salivary secretion at different flow rates. 5. Describe the neural and muscular events that mediate swallowing. 6. Describe the mechanism of swallowing phases (oral, Pharyngeal, and esophageal). 7. Discuss the neural control and the mechanism of vomiting.
Diseases of the oral cavity (Pathology) 3	<ol style="list-style-type: none"> 1. Give a brief account of some common oral diseases. 2. Describe the etiology, pathogenesis, and pathology of the main diseases of oral cavity. 3. Provide a brief account of infectious/inflammatory diseases of the salivary glands. 4. List the most important salivary gland tumors and briefly describe their pathology.
The Pharynx and Esophagus (Anatomy) 4	<ol style="list-style-type: none"> 1. Describe different parts of the pharynx and their boundaries 2. Identify different muscles that contribute to the wall of the pharynx, their innervation and main action 3. Identify the most common clinical conditions related to weakness in the pharyngeal musculature 4. Describe the contents of different parts of the pharynx: nasopharynx, oropharynx, and laryngeopharynx 5. Identify the characteristic location of palatine tonsils and

	<p>their anatomical relations</p> <p>6. Identify different layers that contribute to the wall of the esophagus and their regional specifications</p>
<p>Diseases of the esophagus</p> <p>(Pathology) 5</p>	<ol style="list-style-type: none"> 1. Describe the main acquired anatomic disorders of the esophagus with emphasis on hiatal hernia, achalasia and diverticulosis in terms of etiology, pathogenesis and pathologic features. 2. Describe the main. 3. Mention the cause, pathologic features, and clinical significance of esophageal varices. 4. Indicate the importance of Barrett's esophagus as an example of a pre-malignant lesion of the esophagus. 5. Describe the main tumors of the esophagus.
<p>The Abdominal Cavity and Peritoneum</p> <p>(Anatomy) 6</p>	<ol style="list-style-type: none"> 1. Indicate the relations and arrangements of the abdominal organs 2. Describe folding and ligaments of the peritoneum 3. Indicate the Intra- and retroperitoneal relations 4. Describe the lesser and greater omenta (sacs) and other related peritoneal fosse and recesses 5. Describe the anatomy of the mesenteries
<p>Anatomy of GI tract Hollow Organs: Stomach, Small, and Large Intestines</p> <p>(Anatomy) 7</p>	<ol style="list-style-type: none"> 1. Indicate the anatomical relationships of the abdominal esophagus 2. Describe the anatomy of stomach (location, parts, and anatomical relations) 3. Describe the anatomy of the duodenum (location, parts, and anatomical relations) 4. Compare the anatomical features of the jejunum and ileum 5. List parts and describe general features and relations of large intestine 6. Discuss the main anatomical features related to surgical removal of the appendix (laproscopic and open appendectomy)
<p>Gastric and Intestinal secretions</p> <p>(Physiology) 8</p>	<ol style="list-style-type: none"> 1. Describe the various types of gastric cells and the secretion of each cell type. 2. Mention the components of gastric juice and the function of each component. 3. Describe the different mechanisms involved in the control of gastric secretion (mechanical, chemical, and neural). 4. Explain the cellular steps involved in acid secretion in

	<p>the stomach.</p> <ol style="list-style-type: none"> 5. Discuss the interaction between neural, hormonal and paracrine regulatory mechanisms regulating 6. Acid secretion at different phases of a meal. 7. Indicate the role of Brunner's glands secretion in duodenum. 8. Mention component of intestinal secretion and its control. 9. Describe the regulation of intestinal secretion.
<p>Histology of GI tract Hollow Organs</p> <p>(Anatomy) 9</p>	<ol style="list-style-type: none"> 1. Identify the four histological layers that contributes to the general structure of the GI tract wall 2. Understand the Enteric Nervous System and its histological organization in GIT 3. Describe the histological structure of the wall and glands of the esophagus 4. Identify the detailed histological structure of the stomach 5. Compare the histological features of different parts of the small intestine 6. Describe the general histological structure of the large intestine <p>Identify the histological features and characteristics of different transitional areas and sphincters (gastro-esophageal, gastro-duodenal, ilio-cecal and recto-anal)</p>
<p>Diseases of the stomach (gastritis & peptic ulcer)</p> <p>(Pathology) 10</p>	<ol style="list-style-type: none"> 1. Provide a simplified classification of diseases of the stomach. 2. Describe gastritis and Helicobacter pylori-induced gastritis in terms of pathogenesis, pathologic features and complications. 3. Describe peptic ulcer disease in term of etiology, pathogenesis, types, and pathological features. 4. Describe other types of gastric ulcerations.
<p>Bacterial infections of GI tract I</p>	<ol style="list-style-type: none"> 1. Learn the epidemiology of these infections including modes of infection, specific related foods, & control measures. 2. Understand the characteristic clinical features of common intestinal bacterial infections. 3. Familiarize with the laboratory diagnostic aspects of the common intestinal bacterial pathogens including their

<p>(Microbiology) 11</p>	<p>sensitivity to antibiotics.</p> <ol style="list-style-type: none"> 4. Understand the pathogenesis of common intestinal bacterial pathogens. 5. Explore the management options of patients with these infections including specific therapeutic agents.
<p>Drugs used in peptic ulcer disease</p> <p>(Pharmacology) 12</p>	<ol style="list-style-type: none"> 1. List major drugs or groups of drugs associated with GI ulceration and ways of preventing or reducing this risk. 2. Describe the mechanism of action of drugs or groups of drugs commonly employed in the management of peptic ulcer disease. 3. Explain the rationale behind the use of drug combination in Peptic ulcer disease. 4. List important antimicrobial drugs employed in peptic ulcer disease, and explain the therapeutic basis of their inclusion in the management of peptic ulcer disease. 5. Enumerate the adverse effects of drugs commonly used in peptic ulcer disease.
<p>Bacterial infections of GI tract II</p> <p>(Microbiology) 13</p>	<ol style="list-style-type: none"> 1. Learn the epidemiology of these infections including modes of infection, specific related foods, & control measures. 2. Understand the characteristic clinical features of common intestinal bacterial infections. 3. Familiarize with the laboratory diagnostic aspects of the common intestinal bacterial pathogens including their sensitivity to antibiotics. 4. Understand the pathogenesis of common intestinal bacterial pathogens. 5. Explore the management options of patients with these infections including specific therapeutic agents.
<p>Anatomy of the Anterolateral Abdominal Wall</p> <p>(Anatomy) 14</p>	<ol style="list-style-type: none"> 1. Describe the landmarks and different regions of the anterolateral abdominal wall 2. Describe the different layers of the abdominal wall including abdominal fasciae and muscles 3. Identify the attachments, extension, innervation and main action for each abdominal wall muscle 4. Describe the organization of the rectus sheath and its contents 5. Describe different abdominal surgical incisions, their location, orientation and application

<p>The Inguinal Region and Abdominal Herniae</p> <p>Anatomy (15)</p>	<ol style="list-style-type: none"> 1. Describe the anatomy of inguinal region and inguinal ligament 2. Describe the inguinal canal: its development, orientation, walls and contents 3. Identify different types of abdominal herniae their cause and clinical manifestation
<p>Parasitic infections of GI tract I</p> <p>(Microbiology) 16</p>	<ol style="list-style-type: none"> 1. The classification of the common intestinal parasitic pathogens. 2. The laboratory diagnostic aspects and life cycles of these pathogens. 3. The epidemiology of these infections including modes of infection, specific related foods, & control measures. 4. The pathogenesis of common intestinal parasitic pathogens. 5. The characteristic clinical features of common intestinal parasitic infections. 6. The management of patients with these infections including specific therapeutic agents.
<p>Gastrointestinal tumours I</p> <p>(Pathology) 18</p>	<ol style="list-style-type: none"> 1. Provide a simplified classification of gastric tumors. 2. Enumerate the main types of gastric carcinoma and describe their main features. 3. Identify the main types of gastric lymphoma
<p>Antiemetics and drugs affecting gastric motility</p> <p>19</p>	<ol style="list-style-type: none"> 1. Describe the mechanism of drug-induced vomiting. 2. List drug classes employed as antiemetics and the mechanism of action for each class. 3. Explain the clinical implications of drugs affecting gastric emptying.
<p>Anatomy of Accessory Digestive Organs: Liver, pancreas, and Gallbladder</p> <p>(Anatomy) 20</p>	<ol style="list-style-type: none"> 1. Describe the detailed anatomy of the liver (location, surfaces, lobes, and ligaments) 2. Describe the anatomy of the biliary system 3. Describe the anatomy and location of the gall bladder 4. Discuss the main anatomical features related to surgical removal of the gall bladder (cholecystectomy) 5. Describe the anatomy of the pancreas (location, parts, and relations)
<p>Histology of Digestive Accessory Organs II: Liver and Gall Bladder I</p>	<ol style="list-style-type: none"> 1. Describe the general histological structure of the liver 2. Understand the different concepts of liver lobules and their functional correlation 3. Recognize the perisinusoidal space of Disse with its

<p>(Anatomy) 21</p>	<p>functional and clinical importance</p> <ol style="list-style-type: none"> 4. Describe the histological structure of the gall bladder
<p>Liver and biliary secretion Pancreatic secretion</p> <p>(Physiology) 22</p>	<ol style="list-style-type: none"> 1. Describe the components of pancreatic secretion. 2. Describe the mechanism of pancreatic secretion from acinar cell. 3. Indicate the composition and the role pancreatic juice in food digestion. 4. Discuss the neural and hormonal mechanisms that regulate pancreatic secretion. 5. List the mechanisms that prevent the pancreas from auto digestion. 6. Describe the components of bile. 7. Indicate the function of each component secreted in bile in digestion. 8. Illustrate the regulation mechanisms involved in the secretion of bile. 9. Describe the enterohepatic circulation of bile acids. 10. Describe the general function of liver
<p>Histology of Digestive Accessory Organs I: Salivary Glands and Pancreas)</p> <p>(Anatomy) 23</p>	<ol style="list-style-type: none"> 1. Describe the main histological features of major salivary glands 2. Identify the histological characteristics that distinguish each salivary gland 3. Describe the histological structure of the exocrine pancreas 4. Describe different cell types found in the islets of Langerhans with their main physiological and clinical importance
<p>Digestion and Absorption in GIT</p> <p>(Physiology) 24</p>	<ol style="list-style-type: none"> 1. Discuss the mechanisms of digestion for carbohydrate, protein digestion and fat digestion 2. Indicate the role of bile salts in fat digestion 3. Compare the specializations leading to increased intestinal surface area. 4. Compare absorption of monosaccharides with that of amino acids and fatty acids. 5. Discuss the molecular basis of membrane transport processes. 6. Explain the factors, which determine whether a molecule is absorbed into the blood or into lymph. 7. Explain the mechanisms by which products of digestion of proteins, carbohydrates, and fats are absorbed into and through the cells lining the alimentary canal. 8. Describe the role of bile in lipid absorption. 9. Understand the mechanisms of absorption of water, sodium, calcium and vitamins. And the role of large

	intestine in water absorption.
Gastric and intestinal motility (Physiology) 25	<ol style="list-style-type: none"> 1. Contrast the two types of electrical activity of the gut. 2. Describe the neural circuits that mediate gastrointestinal motility. 3. List the hormones that control the GI tract motility. 4. Describe tonic contraction of GI tract smooth muscle and migrating motor complex of GIT. 5. Explain the receptive relaxation reflex, stomach motility and emptying, and factors affecting these processes (mechanical, chemical, hormonal, and neural). 6. Explain the role of the duodenum in regulating gastric motility. 7. Contrast the propulsive and mixing motility in small and the regulation of these movements. 8. Describe the motor activity of large intestine. 9. Describe the process of defecation.
Diseases of the intestines I (malabsorption (inflammatory bowel diseases) (Pathology) 26	<ol style="list-style-type: none"> 1. Briefly, discuss the main developmental anomalies of the small intestine. 2. Describe malabsorption in terms of causes, clinical significance, and complications. 3. Understand the pathology of Celiac disease and its clinical significance.
Antidiarrheal drugs and laxative agents (Pharmacology) 27	<ol style="list-style-type: none"> 1. Review the physiological aspects of normal bowel habits. 2. Describe the therapeutic aims of antidiarrheal drugs, major classes and describe their mechanism of action. 3. Indicate the major adverse effects possibly encountered in patients using antidiarrheal drugs. 4. List the major classes of drugs employed as laxatives and describe their mechanism of action. 5. List the major indications and contraindications of laxatives. Indicate the specific adverse effects associated with the commonly used laxative agents. 6. List major drug classes employed in the management of inflammatory bowel disease.
Diseases of the intestine II (Ischemic bowel disease, bowel obstruction & inflammatory bowel diseases) (Pathology)28	<ol style="list-style-type: none"> 1. Describe the types of ischemic bowel disease in term of etiology and pathologic features. 2. Describe the chronic inflammatory bowel disease in terms of its main types, etiology, clinical, endoscopic, and pathologic features. 3. Identify the main causes of bowel obstruction. 4. Discuss briefly the diverticular diseases of the bowel.
Introduction to liver diseases Cholestasis and cirrhosis	<ol style="list-style-type: none"> 1. Describe the general morphologic and functional patterns of hepatic injury 2. Understand the different liver diseases manifestation and terminology.

(Pathology) 29	<ol style="list-style-type: none"> 3. Define cholestasis and list its main causes. 4. List the main causes of hepatic failure and describe the pathogenesis, pathologic features, and complications of this disorder.
Embryology of the Digestive System (Anatomy) 30	<ol style="list-style-type: none"> 1. Describe the development of the primordial gut and distinguish the mucosal origin of each region 2. Identify the derivatives of each part of the primordial gut (foregut, midgut, and hindgut) 3. Understand the development of the stomach, its rotation, and the effects of this rotation 4. Understand the development of the midgut, its rotation, and the effects of this rotation 5. Identify the common congenital abnormalities associated with the development of the GIT.
Viral Infections of GIT (Microbiology) 31	<ol style="list-style-type: none"> 1. The classification and characteristics of the common hepatitis (HAV, HBV, HCV, HEV, & others), and intestinal (Rota, Adenoviruses 40 & 41, Norwalk, Corona, & Astro-viruses) viral pathogens. 2. The laboratory diagnostic aspects of these pathogens. 3. The epidemiology of these infections including modes of infection, specific related foods, & control measures. 4. The pathogenesis of common intestinal viral pathogens. 5. The characteristic clinical features of common intestinal viral infections. 6. The management of patients with these infections including specific therapeutic agents. 7. The control measures of these infections.
Gastrointestinal tumours II (Pathology) 32	<ol style="list-style-type: none"> 1. Provide a simplified classification of small and large intestinal tumors. 2. Describe polyps in terms of types and pathological features. 3. Describe the adenoma-carcinoma sequence and the two-hit hypothesis of development of colorectal carcinoma.
Anti-cancer drugs (Pharmacology) 33	<ol style="list-style-type: none"> 1. Review the molecular biology of common cancer types affecting the GIS including esophageal, gastric and colorectal carcinomas 2. Review the risk factors associated with the development of cancer types affecting the GIS 3. Discuss the pharmacology of conventional cytotoxic anticancer drugs used for treatment of GIS cancers 4. Understand the side effects and limitations associated

	<p>with the use of conventional cytotoxic drugs</p> <ol style="list-style-type: none"> 5. Understand the pharmacology of molecular targeted drugs and the rationale for their use for GIS cancer treatment
<p>Liver function tests and detoxification</p> <p>(Biochemistry) 34</p>	<ol style="list-style-type: none"> 1. List the most common used liver function tests 2. Describe the clinical significance these tests 3. Describe the role of liver in ethanol metabolism
<p>Epidemiology and prevention of colorectal cancers.</p> <p>(Public Health) 35</p>	<ol style="list-style-type: none"> 1. Describe the therapeutic aims of antidiarrheal drugs. 2. List the major classes of antidiarrheal drugs and describe their mechanism of action. 3. Indicate the major adverse effects possibly encountered in patients using antidiarrheal drugs. 4. List major drug classes employed in the management of inflammatory bowel disease.
<p>Pathology of the Biliary tract</p> <p>(Pathology) 36</p>	<ol style="list-style-type: none"> 1. Discuss the disorders of the gallbladder with emphasis on cholelithiasis, cholecystitis and tumours. 2. Discuss the disorders of the intrahepatic and extrahepatic bile ducts including Choledocholithiasis, ascending cholangitis, and extrahepatic biliary atresia. 3. Describe the pathology of the major tumors of the biliary tree.
<p>Enzymes of the GI tract system</p> <p>(Biochemistry) 37</p>	<ol style="list-style-type: none"> 1. List the digestive enzymes and hormones 2. Describe how the digestive enzymes and hormones are activated 3. Understand the role of digestive enzymes in the process of digestion <ul style="list-style-type: none"> • Discuss the clinical significance of some enzymes and hormones
<p>Liver tumors & Diseases of exocrine pancreas</p> <p>(Pathology lecture) 38</p>	<ol style="list-style-type: none"> 1. List and describe the major tumors of the liver. 2. List the main congenital anomalies of the pancreas. 3. Define cystic fibrosis and describe its etiology, pathogenesis, and pathologic features. 4. Describe the causes, pathogenesis, and pathologic feature of different forms of pancreatitis. 5. List and describe the major tumor of exocrine pancreas.
<p>Endoscopic procedures of GI tract</p> <p>(clinical lecture) 39</p>	<ol style="list-style-type: none"> 1. Familiarize with updated types of endoscopic procedures 2. Understand common indications for these procedures 3. Understand the diagnostic potential of these procedures 4. Understand the limitations of these procedures
<p>Hepatitis</p> <p>(clinical notes) 40</p>	<ol style="list-style-type: none"> 1. Understands world and local epidemiology of hepatitis 2. Recognize common causes of hepatitis 3. Understand clinical patterns of hepatitis 4. Familiarize with preventable causes of hepatitis 5. Familiarize with treatable causes of hepatitis

Gallbladder diseases

(clinical lecture) 41

1. Understand epidemiology of gallbladder diseases
2. Recognize clinical patterns of gallbladders diseases
3. Familiarize with laboratory profiles of these diseases
4. Understand different management options

(B) Labs objectives

#	TITLE	OBJECTIVES
1	Anatomy 1 (Anterior abdominal wall, inguinal region and upper GI tract)	<ol style="list-style-type: none">1. Identify the main structures of the oral cavity and associated salivary glands and ducts.2. Identify the pharynx and its parts and main features and relations.3. Identify the abdominal esophagus including: location, muscular wall, relations, and vascular supply.2. Identify the layers of the anterior abdominal wall including:<ul style="list-style-type: none">❖ Skin.❖ Fascia (superficial and deep).❖ Abdominal wall muscles (origin, insertion and fascial coverings including the rectus sheath).3. Identify and recognize the inguinal region including:<ul style="list-style-type: none">❖ Inguinal ligament formation.❖ Inguinal canal (location, walls and contents).❖ Deep and superficial inguinal canal openings (rings).❖ The spermatic cord and its coverings.4. Explore Living anatomy:<ul style="list-style-type: none">❖ Describe the topographic planes and divisions of the anterior abdominal wall.❖ Identify and palpate iliac crest, costal margin, linea alba, rectus abdominis, subcostal margin, inguinal ligament and canal, deep and superficial inguinal rings.5. Describe and identify the visceral and parietal peritoneal coverings including peritoneal layers, reflections, folding mesenteries, omenta, falciform ligament, fossae, pouches, spaces, and gutters.
2	Anatomy 2 Peritoneal covering, Lower GI tract and abdominal organs	<ol style="list-style-type: none">1. Identify and describe the stomach including:<ul style="list-style-type: none">❖ Parts.❖ Surfaces and borders.❖ Epiploic foramin, location, borders and relation.❖ Vascular supply.2. Radiological anatomy:<ul style="list-style-type: none">❖ Plane abdomen X-ray.❖ Barium swallow and meal.3. Identify and describe the small intestine including: duodenum, jejunum and ileum4. Identify and describe the large intestine including:<ul style="list-style-type: none">❖ Cecum and appendix❖ Different parts of the colon.

		<ul style="list-style-type: none"> ❖ Anal canal <ol style="list-style-type: none"> 5. Identify and describe the liver including: <ul style="list-style-type: none"> ❖ Location, lobes, borders, and relations. ❖ Liver peritoneal coverings and attachments including triangular, coronary and falciform ligaments. ❖ The porta hepatis and vascular supply: portal vein, hepatic artery and the extra-hepatic biliary system. 6. Identify and describe the gallbladder including: <ul style="list-style-type: none"> ❖ Parts, location, borders and relations. ❖ Vascular supply. 7. Identify and describe the pancreas including: <ul style="list-style-type: none"> ❖ Parts, location, and relations. ❖ The main and accessory pancreatic ducts 8. Identify the arterial blood supply to different parts of the GI tract and visceral organs 9. Identify and describe the portal system of circulation
3	Anatomy 3 (Histology of the GI tract)	<ol style="list-style-type: none"> 1. Describe the microscopic structure of the esophagus. 2. Describe the microscopic structure of the stomach including the detailed histology of gastric glands 3. Describe the microscopic structure of the small intestine including duodenum, jejunum and ileum with their distinguishing features. 4. Describe the microscopic structure of cecum and large intestine. 5. Describe the microscopic structure of the appendix. 6. Identify the Recto-anal junction and the change in epithelial covering 7. Describe and study the microscopic structure of the tongue including mucosa, muscles and papillae. 8. Describe the microscopic structure of the major salivary glands: parotid, submandibular and sublingual. 9. Describe the microscopic structure of the solid organs including: <ul style="list-style-type: none"> ❖ Liver ❖ Pancreas ❖ Gallbladder
4	Pathology 1	<ol style="list-style-type: none"> 1. Describe the morphology of the more common disease of the salivary glands. <ul style="list-style-type: none"> ❖ Mucocele. ❖ Sialolithiasis. ❖ Sjogren's syndrome. ❖ Tumors. 2. Describe the morphology of the following esophageal diseases: <ul style="list-style-type: none"> ❖ Esophagitis (different types).

		<ul style="list-style-type: none"> ❖ Barret's esophagus and adenocarcinoma. ❖ Esophageal varices. ❖ Squamous cell carcinoma <p>3. Describe the morphology of the following gastric disease.</p> <ul style="list-style-type: none"> ❖ Gastritis. ❖ Gastric ulceration. ❖ Gastric adenocarcinoma
6	Pathology 2	<p>1. Describe the morphology of the following small intestine disorders:</p> <ul style="list-style-type: none"> ❖ Enteritis. ❖ Tumors (caroinoid, lipoma, adenocarcinoma, lymphoma) ❖ Celiac disease and other causes of malabsorption. <p>2. Describe the morphology of the following large intestinal disorders:</p> <ul style="list-style-type: none"> ❖ Colonic polyps and adenomas. ❖ Colonic adenocarcinoma. ❖ Diverticular disease.
7	Pathology 3	<p>1. Describe the morphology of inflammatory bowel disease and other forms of colitis and tutorial on them.</p> <ul style="list-style-type: none"> ❖ Ulcerative colitis. ❖ Crohn's disease. ❖ Pseudomembranous colitis.
8	Pathology 4	<p>1. Describe the morphology of the following liver disorders:</p> <ul style="list-style-type: none"> ❖ Steatosis. ❖ Cirrhosis. ❖ Pigmentory. ❖ Neoplasms. ❖ Hepatitis. <p>2. Describe the morphology of the following gall bladder and biliary disorders:</p> <ul style="list-style-type: none"> ❖ Chololelithiasis and cholecystitis. ❖ Carcinoma of the gall bladder. ❖ Cholestasis.
9	Microbiology	<p>1. Examine wet preparation for fecal leucocytes and RBCs.</p> <p>2. Prepare stool culture for Salmonella and Shigella.</p> <p>3. Identify the following parasites in slides: Asacaris, Trichuris, Enterobius, Hookworm, Tinea saginata</p>

Course Assessment

Assessment		
Assessment Type	Expected Due Date	Weight
First Exam		--
Second Exam		--
Midterm Exam (Theory)		60
Evaluation		5
Quizzes		--
Research activity		5
OSCE		--
Mini-OSCE		--
Final Exam (Practical)		30
Final Exam(Oral)		--
Total		100

Students Learning Outcomes

Student Learning Outcomes (SLOs) (4-8 Maximum) Upon successful completion of this course, students should be able to:			
SLOs	Related ILO(s)* (numbers only)	Evaluation Criteria (MCQ, OSCE, Homework...)	
		Type of Criteria (MCQ, OSCE, Homework...)	Weight (%)
Describe the anatomical and histological structure, development, and function of the different organs of the GI system.	1	MCQ	25
Describe the various pathologic diseases and infections of the GI system and understand their mechanisms.	1,2	MCQ	25
Explain signs, symptoms and investigations related to GI disorders and explain the scientific bases for common disease presentations by Integrating basic sciences with clinical sciences of GI tract.	1-3,7,8	MCQ	25
Describe drugs used in the treatment of various GI diseases and discuss the epidemiology of those diseases, their prevention and control.	9	MCQ	25
			100

Intended Learning Outcomes (ILOs)

- 1) Demonstrate a sufficient understanding of the structural organization and functions of the following systems of the human body: circulatory, respiratory, gastrointestinal, endocrine, hematopoietic & lymphatic, musculoskeletal, nervous, and genitourinary systems.
- 2) Conceptualize the cellular, molecular, genetic, and biochemical mechanisms that maintain body's homeostasis and their derangements in disease states.
- 3) Apply their knowledge of human anatomy and function to solve questions regarding major clinical cases and diseases.
- 4) Attain appropriate and systematic clinical history of different medical conditions and settings.
- 5) Demonstrate proficiency in performing clinical skills and procedures.
- 6) Perform relevant physical examination on patients professionally and ethically.
- 7) Identify the major signs and symptoms of disease states, recognizing risk factors and etiologies, in an interdisciplinary approach to differentially diagnose patients.
- 8) Order and interpret results of relevant basic diagnostic procedures, such as laboratory investigations and conventional imaging procedures.
- 9) Apply safe and accurate methods of pharmacotherapy of major disease states.
- 10) Critically appraise research studies guided by evidence-based medicine.
- 11) Demonstrate ability to work in diverse settings and communities.