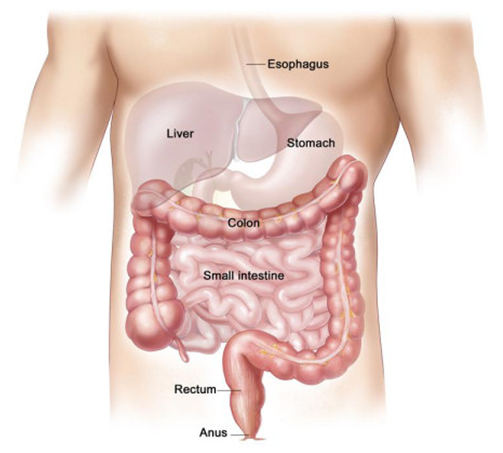


**YARMOUK UNIVERSITY**

**FACULTY OF MEDICINE**

**GASTRO-INTESTINAL SYSTEM (MED 320)**



Department of Medicine

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| **COURSE INFORMATION** | |
| **COORDINATOR** | **Dr. Ola Soudah** |
| **COURSE TITLE** | **Gastro-intestinal tract** |
| **COURSE CODE** | **Med 320** |
| **COURSE CREDIT HOURS** | **6 Credit Hours** |
| **COURSE MEETING TIME** | **8-12 (SUN., MON., TUE., WED.)** |
| **COURSE MEETING ROOM** | **PHu01** |
| **WELCOME LETTER FROM THE MODULE COORDINATOR** | |
| Dear Students,  I would like to welcome you to the “Gastrointestinal System Module. This syllabus will show you details of necessary knowledge related to each subject. This course requires an intensive coursework load and we will cover only the major aspects of the subject. Therefore, you are required to put more effort on self-directed learning strategies; also class attendance and participation are extremely important to your learning. Attendance will be monitored during the different teaching activities. If your absence reaches 15% of the total lectures, you may not be allowed to sit for the final examination.  Please note that you have to attend the exams on time. We will not allow any late coming student to join the exam. Sickness leaves from private hospitals or clinics may only be accepted after approval of the faculty medical committee.  You will receive the detailed teaching timetables including location and name of lecturer for each discipline.  As a coordinator, I will be meeting with the CR every week to receive your feedback and comments and to try to resolve any difficulties during the implementation of the module.  We wish you all the success with this Module. | |
| **COURSE DESCRIPTION** | |
| Interdisciplinary integrative course which explores fundamental concepts of biochemistry anatomy, histology, physiology, public health problems, pathology, pharmacology, and microbiology as they relate to issues and common diseases of Gastrointestinal and hepatobiliary system. Pharmacology and therapeutic management of common GI problems are also explored. Teaching methods include lectures, practical classes, clinically oriented seminars and small group discussions.  The practical part of the course gives emphasizes on the anatomy, pathology, pharmacology and microbiology of the gastrointestinal system. In addition, small group discussions of common clinical problems are part of the teaching strategy of this module to enhance integration of basic sciences and clinical knowledge and students' self-directed learning | |
| **COURSE LEARNING OBJECTIVES** | |
| * + - Describe the gross structure and functional anatomy of each GIT organ.     - Recognize the microscopic appearance of different parts of the GIT and the normal embryology development with their congenital abnormalities.     - Describe the function of each GIT structure.     - Explain how neuronal mechanisms and GIT hormones regulate gastrointestinal, pancreatic, and biliary functions.     - Describe the major types of nutrients.     - Explain how proteins, carbohydrates, and fats are digested and absorbed.     - Identify and describe the major disease processes including neoplasm's and malabsorption conditions affecting different organs of GIT in terms of pathogenesis, gross and microscopic changes, manifestations, and complications.     - Identify various bacterial, viral, fungal, and parasitic infections affecting     - GIT, and describe the principle manifestations, diagnosis, treatment, and prevention of each individual microorganism and parasitic agent affecting GIT.     - Describe the mechanisms of action, pharmacokinetics, indications, and adverse effects of commonly used drugs in the treatment of GIT disorders (vomiting, peptic ulcer disease, constipation, and diarrhea).     - Describe the essential nutritional requirement, body weight and energy balance, nutritional deficiencies, and disease processes associated with diet.     - 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. | |

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| **COURSE POLICIES** |
| * Attendance at lectures is strongly encouraged. * Excused absences for examinations normally will be given only in cases of serious illness or a death in the student’s immediate family, any other excuses will not be accepted. * An un-excused absence will result in a grade of zero for that exam. This is a standard policy of the Faculty of Medicine. * Make-up exams are given only in unusual circumstances and it includes written exam. |

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| **METHODS OF INSTRUCTION** |
| * + - Lectures.     - Practical classes.     - Clinically oriented seminars and small group discussions |
| **STUDENT ASSESSMENT** |
| * **Midterm exam (50%):**   + Practical exam =25%   + Theory +small group discussion =75% * **Final exam (50%):**   + Theory session only = 100% |
| **RECOMMENDED TEXT BOOKS AND ATLASES** |
| * **Anatomy**:   + Grays anatomy for students, Drake,Vogl, Mitchell   + Clinical Anatomy for Medical Students. By R. S. Snell, latest edition.   + Grants Atlas of Anatomy or any other Atlas of Human Anatomy.   + Basic Histology. By L. Carlos Junqueira, latest edition.   + Before we are born. By K. L. Morre and T. V. N. Persuade, latest edition.   + Langman’s medical embryology   + Color textbook of histology Gartner and Hiatt  Physiology:  * + Textbook of Medical physiology. By Guyton and Hall, 11th,12th, 13th editions 2005.   + Review of medical physiology. By WF Ganong 24th edition 2009.  Biochemistry:  * + Delvin: Textbook of Biochemistry with Clinical correlations.  Pathology:  * + Basic Pathology. By Kumar, Cotran and Robbins, latest edition.   + Supplementary Departmental handouts.  Microbiology:  * + Medical Microbiology. An Introduction to Infectious Diseases. By Sheries, latest edition.  Pharmacology:  * + Textbook: Lippincott’s Illustrated Reviews Pharmacology by Richard Harvey and Pamela Champe, 4Th Edition, 2009 Reference Books:   + The pharmacological Basis of Therapeutics Goodman and Gilman 11th Edition 2006.   + Basis and Clinical Pharmacology B.G. Katzung 10th Edition 2007.   + Pharmacology Rang, Dale, Ritter and Moore 6th Edition 2007.  Public Health:  * + Supplementary Departmental handouts. |

# Specific (Learning) Objectives:

After studying the material covered in lectures, practical sessions, clinical seminars and case presentations of this course, using his/her private self learning time in a productive way, the student is expected to achieve the following specific objectives:

## Lectures:

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| **#** | **Lecture Title** | **Lecture Objectives** | |
| 1 | Introductory Case Presentation for | 1. | Understand the general outline of the GIT module. |
| & | GIT System | 2. | Be familiar with the modalities of teaching throughout the course. |
| 2 | **(multidisciplinary)** | 3. | Acknowledge the important relation between normal and abnormal |
|  |  |  | structure and function |
|  |  | 4. | Appreciate the importance of basic sciences in clinical application. |
| 3 | Anatomy and histology of oral | 1. | Describe parts of the mouth. |
| & | cavity, salivary glands, pharynx, | 2. | Describe the gross anatomy and histology of the tongue, palate, |
| 4 | and esophagus |  | teeth and gum |
|  | **(Anatomy)** | 3. | Identify tongue papillae and describe their structures. |
|  |  | 4. | Describe briefly the anatomy and histology of various salivary |
|  |  |  | glands. |
|  |  | 5. | Describe the anatomy and histology of various parts of the |
|  |  |  | pharynx. |
|  |  | 6. | Identify the muscular wall structure of the esophagus and its |
|  |  |  | anatomical relations and sphincters. |
|  |  | 7. | Describe the nerve and blood supply of the pharynx and esophagus. |
| 5 | Salivary secretion + Esophageal | 1. | Describe the physiological role of various salivary glands. |
|  | motility and vomiting | 2. | Describe the mechanisms involved in the regulation of salivary |
|  | **(Physiology)** |  | secretion. |
|  |  | 3. | Describe the components and function of saliva. |
|  |  | 4. | Describe the mechanism of swallowing phases (oral, Pharyngeal, and |
|  |  |  | Esophageal). |
|  |  | 5. | Discuss the neural control of swallowing and the mechanism of |
|  |  |  | vomiting. |
|  |  | 6. | Heart burn, swallowing and vomiting. |
| 6 | Diseases of the oral cavity | 1. | Give a simplified classification of diseases of oral cavity. |
|  | **(Pathology)** | 2. | Describe the etiology, pathogenesis, and pathology of the main |
|  |  |  | diseases of oral cavity. |
|  |  | 3. | Classify the diseases of the salivary glands. |
|  |  | 4. | Provide a list of the of salivary gland tumors and briefly describe |
|  |  |  | their pathology. |
| 7 | Gastric and intestinal secretion | 1. | Describe the various types of gastric cells and the secretion of each |
|  | **(Physiology)** |  | cell type. |
|  |  | 2. | Mention the components of gastric juice and the function of each |
|  |  |  | component with special attention on the role of hormones and other |
|  |  |  | factors influencing gastric secretion. |
|  |  | 3. | Describe the different mechanisms involved in the control of gastric |
|  |  |  | secretion (mechanical, chemical, and neural). |
|  |  | 4. | Mention component of intestinal secretion and its control. |
| 8 | The abdominal walls and inguinal | 1. | Describe the landmarks and different regions of the anterior |
|  | region |  | abdominal wall. |
|  | **(Anatomy)** | 2. | Describe the layers of the anterior abdominal wall including |
|  |  |  | abdominal muscles and rectus sheath. |
|  |  | 3. | Describe the anatomy of inguinal region. |
|  |  | 4. | Describe the spermatic cord coverings and contents. |
|  |  | 5. | 5. Make a comparison between the inguinal, umbilical, and femoral |
|  |  |  | herniae. |

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| 9&10 | Diseases of the esophagus | 1. | Describe the main acquired anatomic disorders of the esophagus with |
|  | **(Pathology)** |  | emphasis on hiatal hernia, achalasia and diverticulosis in terms of |
|  |  |  | etiology, pathogenesis and pathologic features. |
|  |  | 2. | Describe the main pathologic features of the esophagus with emphasis |
|  |  |  | on reflux esophagi is. |
|  |  | 3. | Mention the cause, pathologic features, and clinical significance of |
|  |  |  | esophageal varies. |
|  |  | 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. |
| 11 | The abdominal cavity and | 1. | Indicate the relations and arrangements of the abdominal organs. |
|  | peritoneum. | 2. | Describe the anatomical features of the diaphragm. |
|  | **(Anatomy)** | 3. | Describe folding and ligaments of the peritoneum. |
|  |  | 4. | Indicate the Intra- and retroperitoneal relations. |
|  |  | 5. | Describe the lesser and greater omen (sacs) and other related |
|  |  |  | peritoneal fosse and recesses. |
|  |  | 6. | Describe the anatomy of the mesenteries. |
| 12 | Anatomy of GIT hollow organs | 1. | Indicate the anatomical relationships of the abdominal esophagus. |
|  | (stomach, duodenum, small and | 2. | Describe the anatomy of stomach (location, parts, and anatomical |
|  | large intestines). |  | relations). |
|  | **(Anatomy)** | 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. | Describe the anatomy of the rectum and anal canal with emphasis on |
|  |  |  | sphincters. |
| 13 | Histology of the GIT | 1. | Describe the histological structure of the wall and glands of the |
|  | “Hollow organs” |  | esophagus. |
|  | **(Anatomy)** | 2. | Identify the histological structure of the stomach. |
|  |  | 3. | Compare the histological features of the small and large intestines. |
|  |  | 4. | Identify the histological features and characteristics of different |
|  |  |  | transitional areas and sphincters (gastro-esophageal, gastro- |
|  |  |  | duodenal, ilio-ceacal and recto-anal). |
| 14 | Diseases of the stomach (gastritis) | 1. | Provide a simplified classification of diseases of the stomach. |
|  | **(Pathology)** | 2. | Describe gastritis and Helicobacter pylori-induced gastritis in terms of |
|  |  |  | pathogenesis, |
|  |  | 3. | Pathologic features and complications. |
| 15 | Disease of the stomach (Peptic | 1. | Describe peptic ulcer disease in term of etiology, pathogenesis, types, |
|  | Ulcer) |  | pathology and complications. |
|  | **( Pathology)** | 2. | Describe other types of gastric ulcerations. |
| 16 | Pathology of gastric tumors | 1. | Provide a simplified classification of gastric tumors. |
|  | **(Pathology)** | 2. | Enumerate the main types of gastric carcinoma and describe their |
|  |  |  | main features. |
|  |  | 3. | Identify the main types of gastric lymphoma. |
| 17 | Enzymes of the GIT system | 1. | List the GIT enzymes |
|  | **(Biochemistry)** | 2. | Describe how the GIT enzymes get activated |
|  |  | 3. | Understand the role of GIT enzymes in the process of digestion |
|  |  | 4. | Discuss the clinical significance of these enzymes including lactase |
|  |  |  | deficiency |
| 18 | Anatomy and histology of | 1. | Describe the anatomy and histology of the liver (location, parts, |
| & | accessory organs of GIT (solid |  | relations and vascular supply). |
| 19 | organs). | 2. | Describe the peritoneal coverings and ligaments of various organs in |
|  | **(Anatomy)** |  | the abdomen. |
|  |  | 3. | Describe the anatomy and histology of the biliary system. |
|  |  | 4. | Describe the anatomy of the pancreas (location, parts, relations and |
|  |  |  | vascular supply). |

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| 20 | Bacterial infection of GIT | 1. | Understand the role of Helicobacter in gastritis as well as laboratory |
|  | ,Gastritis and Helicobacter pylori |  | diagnosis and sensitivity to antibiotics. |
|  | **(Microbiology)** | 2. | Recognize morphology ,culture, and the pathogenesis of causative |
|  |  |  | bacteria (Salmonella, |
|  |  | 3. | Shigella and Campylobacter) |
|  |  | 4. | Appreciate epidemiology and treatment. |
| 21 | Diseases of the intestines I | 1. | Describe malabsorption in terms of causes, clinical significance, and |
|  | (malabsorption) |  | complications. |
|  | **(Pathology)** | 2. | Understand the pathology of celiac disease and its clinical |
|  |  |  | significance |
| 22 | Metabolic processes in the liver including ethanol metabolism and its side effects  **(Biochemistry)** | 1. Describe specificity of carbohydrate, lipid, amino acid and nitrogen metabolism in the liver 2. Describe the role of liver in ethanol metabolism    * Alcohol dehydrogenase enzyme    * Aldehyde dehydrogenase enzyme    * Microsomal ethanol oxidizing system (MEOS) 3. Understand the effects of alcohol and its metabolic products on body organs | |
| 23 | Pancreatic secretion | 1. | Describe the mechanism of pancreatic secretion from acinar cell. |
|  | **(Physiology)** | 2. | Indicate the composition and the role pancreatic juice in food |
|  |  |  | digestion. |
|  |  | 3. | Describe the activation of the pancreatic enzymes in the lumen of the |
|  |  |  | small intestine. |
|  |  | 4. | Illustrate the regulation of pancreatic secretion (hormonal and neural). |
| 24 | Embryology of the gut I . | 1. | Describe the development of the forgut, midgut, and hindgut. |
|  | **(Anatomy)** | 2. | Describe the development of liver, pancreas, and spleen |
|  |  | . |  |
| 25 | Liver and Billiary secretion | 1. | Describe the components of bile. |
|  | **(Physiology)** | 2. | Indicate the function of each component secreted in bile in digestion. |
|  |  | 3. | Illustrate the regulation mechanisms involved in the secretion of bile. |
| 26 | Blood supply of GIT and portal | 1. | Describe the blood supply of the stomach, liver, pancreas, spleen, |
|  | circulation |  | duodenum, small and large intestines including rectum and anal canal. |
|  | **(Anatomy)** | 2. | Describe the formation, major tributaries, branches, relations, and |
|  |  |  | termination of the portal system. |
| 27 | Drugs used in peptic ulcer disease I | 1. | List major drugs or groups of drugs associated with GI ulceration and |
|  | and II |  | ways of preventing or reducing this risk. |
|  | **(Pharmacology)** | 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. |
| 28 | Diseases of the intestine II (inflammatory bowel diseases) **(Pathology)** | 1. | Describe the chronic inflammatory bowel disease in terms of its main types, etiology, clinical, endoscopic, and pathologic features. |
| 29 | Gastric and intestinal motility | 1. | Explain the receptive relaxation reflex and the basic electrical rhythm |
|  | **(Physiology)** |  | of the stomach motility and emptying, and factors affecting these |
|  |  |  | processes (mechanical, chemical, hormonal, and neural). |
|  |  | 2. | Identify the different types of propulsive and mixing motility in small |
|  |  |  | and large intestine and the regulation of these movements. |

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| 30 | Disease of the intestine III (Ischemic bowel disease and bowel obstruction  **(Pathology)** | 1.  2.  3. | Describe the types of ischemic bowel disease in term of etiology and pathologic features  Identify the main causes of bowel obstruction. Discuss briefly the diverticular diseases of the bowel. |
| 31 | Liver function tests  **(Biochemistry)** | 1.  2. | List the most common used liver function tests Describe the clinical significance of each of these tests |
| 32 | Food poisoning Cholera **(Microbiology)** | 1.  2. | Understand the role of E. Coli, Clostridium perfringens, C. botuliunum, Staphylococcus aureus and B. cerius in food poisoning. Appreciate their pathogenesis and epidemiology.  Recognize morphology, culture and pathogenesis of Vibrio cholerae. |
|  | Diseases of the intestine IV (bowel | 1. | Provide a simplified classification of small and large intestinal |
| 33 | obstruction and tumors) |  | tumors. |
|  | **(Pathology)** | 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. |
|  |  | 4. | List the main diseases of appendix. |
| 34 | Embryology of the GIT II  **(Anatomy)** | 1. Describe the common congenital abnormalities of the GIT. | |
|  | Innervations and Lymphatic | 1. | Describe the nerve supply of different parts of the GIT from the |
|  | drainage of the GIT |  | mouth to the anus. |
| 35 | **(Anatomy)** | 2. | Describe the innervations of associated digestive organs (Liver, gall |
|  |  |  | bladder, Pancreas, and spleen). |
|  |  | 3. | Describe the Lymphatic drainage and regional lymph nodes and major |
|  |  |  | trunks of different parts of GIT and associated abdominal organs. |
|  | Antiemetics and drugs affecting | 1. | Describe the mechanism of drug-induced vomiting. |
| 36 | gastric motility | 2. | List drug classes employed as antiemetics and the mechanism of |
|  | **(Pharmacology)** |  | action each class. |
|  |  | 3. | Explain the clinical implications of drugs affecting gastric emptying. |
| 37 | Viral hepatitis  **(Microbiology)** | 1. | Recognize the characteristics of various types of viruses affecting the liver (HAV, HBV, HCV and HEV), their modes of infection, laboratory diagnosis, and epidemiology. |
|  | Antidiarrheal drugs | 1. | Describe the therapeutic aims of antidiarrheal drugs. |
| 38 | **(Pharmacology)** | 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. |
| 39 | Digestion and Absorption in GIT | 1. | Indicate the role of Brunner’s glands in duodenum and of bile salts in |
|  | **(Physiology)** |  | fat digestion and absorption (mechanical, hormonal, and neural). |
|  |  | 2. | Describe the enterohepatic circulation of bile acids. |
|  |  | 3. | Explain the mechanisms of absorption of the principal inorganic |
|  |  |  | components of diets. |
|  |  | 4. | Discuss the molecular basis of membrane transport processes. |
|  |  | 5. | Explain the factors, which determine whether a molecule is absorbed |
|  |  |  | into the blood or into lymph. |
|  |  | 6. | Explain the mechanisms by which products of digestion of proteins, |
|  |  |  | carbohydrates, and fats are absorbed into and through the cells lining |
|  |  |  | the alimentary canal. |

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| 40 | Epidemiology and prevention of colorectal cancers.  **(Public Health)** | Objectives: By the end of the lecture students will:   1. Gain knowledge on :    1. Descriptive epidemiology of the disease in terms of :       * identification of high risk groups       * geographical distribution of disease       * time trend of disease.    2. Risk factors of the disease in terms of :       * lifestyle factors       * genetic susceptibility       * other host factors       * related medical conditions 2. Understand preventive and control measures of the disease including:    1. Strategies of primary prevention.    2. Measures of screening and early detection of the disease. |
| 41 | Introduction to liver diseases  **(Pathology)** | 1. Describe the general morphologic and functional patterns of hepatic injury 2. Understand the different liver diseases manifestation and terminology. |
| 42 | Cholestasis and cirrhosis  **(Pathology)** | 1. Define cholestasis and list its main causes. 2. List the main causes of hepatic failure and describe the pathogenesis, pathologic features, and complications of this disorder. 3. Define cirrhosis and describe the pathologic features and complications of this condition. |
| 43 | Amoebiasis  **(Microbiology)** | 1. Understand the differences between Entameoba histolytica and other amoeba, laboratory diagnosis, and treatment. 2. Describe both intestinal and extra intestinal infections. |
| 44 | Metabolic disease of liver  **(Biochemistry)** | 1. Describe glycogen storage diseases 2. Describe inherited disorders of bilirubin metabolism 3. Discuss alpha-1 antitrypsin deficiency and its role in liver disorders 4. Lysosomal storage diseases 5. Hepatolenticular degeneration (Wilson's disease) |
| 45 | Schistosomiasis and Hydatid disease  **(Microbiology)** | 1. Recognize the life-cycle, pathogenesis and the infection caused by Schistosoma mansion and Echinococcus granulosus. 2. Understand the epidemiology and treatment of Schistosomiasis and Hydatid disease. |
| 46 | Intestinal infections with parasites I  **(Microbiology)** | 1. Understand infections arising from Ascaris, Enterobius, Trichuris and Toxocara. 2. Recognize the life cycle, morphology and treatment of each parasite. |
| 47 | Laxative agents  **(Pharmacology)** | 1. Review the physiological aspects of normal bowel habits. 2. List the major classes of drugs employed as laxatives and describe their mechanism of action. 3. List the major indications and contraindications of laxatives. 4. Indicate the specific adverse effects associated with the commonly used laxative agents. |
| 48 | Hepatitis and alcohol liver disease  **(Pathology)** | 1. Identify the different clinical syndromes of hepatitis including neonatal hepatitis, with emphasis on laboratory and pathologic features of each condition. 2. Describe the other non-infectious causes of hepatitis. 3. Discuss alcoholic liver disease as a classical example of toxin- induced liver disease in terms of pathogenesis and pathologic manifestations. 4. The causes, types, routes, and pathological features of hepatitis. 5. Describe the role of the liver biopsy in hepatitis. |
| 49 | Liver tumors  **(Pathology)** | 1. List and describe the major tumors of the liver. |

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| 50 | Epidemiology, prevention, and control of viral hepatitis. **(Public Health)** | Objectives: By the end of the lecture students will:   1. Gain knowledge on:    1. The socio-demographic and the geographic distribution of the diseases.    2. Reservoir and mode of transmission 2. Appreciate various levels of control of the diseases including:    1. Preventive measures    2. Control of patients, contacts, and environment    3. Epidemic measures |
| 51 | Intestinal infections with parasites II  **(Microbiology)** | 1. Understand infection caused by Taenia, Himenolepis nana, Ancylostoma and Fasciola, their laboratory diagnosis, epidemiology and treatment. |
| 52 | Drug-induced liver injury (DILI)  **(Pharmacology)** | 1. Review the types of organ reactions in response to drug toxicities. 2. Classify the common types of (DILI) with example on each type. 3. Have a reasonable approach to the patient with presumed (DILI). 4. Be familiar with the management of some important cases of DILI   e.g. paracetamol overdose.  5. List the major groups of drugs that should be avoided in liver cirrhosis |
| 53 | Disease of Extrahepatic Biliary I  **(Pathology)** | 1. Circulatory disorders of the liver 2. Describe disorders of the liver |
| 54 | Diarrhea due to viruses  **(Microbiology)** | 1. Identify the characteristics of Rota viruses and to a lesser extent those of adenoviruses 40 and 41 Norwalk, Coronaviruses and Astroviruses. 2. Describe the infection mechanism, define antibody response, and understand epidemiology, laboratory diagnosis, and control. |
| 55 | Disease of Extrahepatic biliary tract II **(Pathology)** | 1. Describe the common diseases of the intra and extrahepatic biliary diseases. 2. Describe the pathology of the major tumors of the biliary tree. |
| 56 | Diseases of exocrine pancreas  **(Pathology)** | 1. List the main congenital anomalies of the pancreas. 2. Define cystic fibrosis and describe its etiology, pathogenesis, and pathologic features. 3. Describe the causes, pathogenesis, and pathologic feature of different forms of pancreatitis. 4. List and describe the major tumor of exocrine pancrease. |
| 57 | Diarrhea due to parasites **(Microbiology)** | 5. Describe the morphology, life cycle, pathogenesis, epidemology, and treatment of Giardia, lamblia, Strongyloides, Balantidium, and Cryptosporidium parvum. |

1. **PRACTICAL LABORATORY SESSIONS:**

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| **#** | **PRACTICLE TITLE** | **OBJECTIVES** |
| 1 | First anatomy practical session (Histology of the GIT I) | 1. Describe and study the microscopic structure of the tongue moucusa, muscles and papillae. 2. Describe the microscopic structure of the salivary glands. 3. Describe the microscopic structure of the esophagus. |
| 2 | Second anatomy practical session.  (Anterior abdominal wall, inguinal region and upper GIT) | 1. Identify main structures of the oral cavity and associated salivary glands and ducts. Also identify the pharynx and its parts and main features and relations. 2. Identify the layers of the anterior abdominal wall including:    * 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: Inguinal ligament formation.   Inguinal canal (location, walls and contents).  Deep and superficial inguinal canal openings (rings). The spermatic cord and its coverings. |
| 3 | Third anatomy practical session  Peritoneal covering, esophagus and stomach | 1. Describe and identify the visceral and parietal peritoneal coverings including peritoneal layers, reflections, folding mesenteries, omenta, falciform ligament, fossae, pouches, spaces, and gutters. 2. Identify the abdominal esophagus including: location, muscular wall, relations, and vascular supply. 3. Identify and describe the stomach including:    * Parts.    * Surfaces and borders.    * Epiploic foramin, location, borders and relation.    * Vascular supply. 4. Living anatomy:  * 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.  1. Radiological anatomy including:    * Plane abdomen X-ray.    * Barium swallow and meal. 2. Describe the microscopic structure of the small intestine including jejunum and ilium. 3. Describe the microscopic structure of the appendix. 4. Describe the microscopic structure of cecum and large intestine. |
| 4 | fourth anatomy practical session (Lower GIT and abdominal organs) | 1. Identify and describe the duodenum including: parts and vascular supply. 2. Identify the jejunum and ileum and their distinguished features. 3. Identify and describe the cecum including:    * Ileocecal valve.    * Appendix. 4. Identify and describe the large intestine including:    * Parts, length, and external structure.    * Vascular supply. 5. Identify and describe the liver including: 6. Location, lobes, borders, and relations. 7. Liver peritoneal coverings and attachments including triangular, coronary and falciform ligaments. 8. The porta hepatis and vascular supply: portal vein, hepatic artery and the extra-hepatic billiary system. 9. Identify and describe the gall bladder including:    1. Parts, location, borders and relations.    2. Vascular supply. |

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|  |  | 1. Identify and describe the pancreas including:    1. Parts, location, and relations.    2. The main and accessory pancreatic ducts. 2. Identify and describe the spleen including:    1. Shape, surfaces, and relation.    2. Vascular supply 3. Describe the microscopic structure of the solid organs including    1. Spleen    2. Liver    3. Pancreas. |
| 5 | Fifth anatomy practical session  (Imaging and Living anatomy of GIT and associated abdominal organs) | Identify and describe:  Abdominal aorta and its various main branches. Inferior vena cava; location and main tributaries.  Describe the surface anatomy of all abdominal organs and vessels. Identify and describe the portal system.  Radiological anatomy including:   1. CT scan and MRI. 2. Abdominal angiography. 3. Identify and describe the salivary and biliary system including:    1. Salivary glands and ducts.    2. Pancreatic and biliary system.    3. Surface anatomy of the above structures. |
| 6 | First pathology practical session | 1. Describe the morphology of the more common disease of the salivary glands.   Mucocele. Sialolithiasis. Sjogren's syndrome. Tumors.   1. Describe the morphology of the following esophageal disease. Esophagitis (different types).   Barret's esophagus and adenocarcinoma. Esophageal varices.  Squamous cell carcinoma   1. Describe the morphology of the following gastric disease. Gastritis.   Gastric ulceration. Gastric adenocarcinoma |
| 7 | Second pathology practical session | 1. Describe the morphology of the following small intestine disorders.   Enteritis.  Tumors (caroinoid, lipoma, adenocarcinoma, lymphoma) Celiac disease and other causes of malabsorption.   1. Describe the morphology of the following large intestinal disorders.    * Colonic polyps and adenomas.    * Colonic adenocarcinoma.    * Diverticular disease. |
| 8 | Third pathology practical session | 1. Describe the morphology of inflammatory bowel disease and other forms of colitis and tutorial on them.    1. Ulcerative colitis.    2. Crohn's disease.    3. Pseudomembranous colitis. |
| 9 | Fourth pathology practical session | 1. Describe the morphology of the following liver disorders Steatosis.    * Cirrhosis.    * Pigmentory.    * Neoplasmas.    * Hepatitis. 2. Describe the morphology of the following gall bladder and biliary disorders    * Chololelithiasis and cholecystitis.    * Carcinoma of the gall bladder.    * Cholestasis. |

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| 10 | First microbiology practical session A: Stool examination  B: Parasites identification | 1. Examination of wet preparation for fecal leucocytes and RBCs. 2. Prepare stool culture for Salmonella and Shigella.   3. Identify the following parasites in slides:  Asacaris, Trichuris, Enterobius, Hookworm, Tinea saginata. |
| 11 | First pharmacology practical session  (Enteral routes and dosage forms administered orally) | 1. List the enteral routes of drug administration. 2. Indicate the factors affecting the bioavailability of orally administered drugs. 3. Make comparison between different enteral routes of drug administration with respect to rate and extent of absorption, first- pass- hepatic effect, safety, and patient convenience. 4. Identify dosage forms of drugs suitable for enteral administration. 5. Describe the effect of enteral dosage forms on drug pharmacokinetics. |

## Small Group Discussion

**Clinical cases to be discussed during the course**

1. **Case of Peptic Ulcer Disease:**

A 46-year old woman known to have chronic arthritis, presents to the emergency room with vomiting of blood "hematemesis ". Prior to that, she was complaining of upper abdominal pain, aggravated by hunger and relieved by antacids for several years. She takes pain killers for her joint pain only. Endoscopy was performed the same day she was admitted to the hospital, and was found to have a 1 cm clean-based ulcer in the duodenal bulb, without stigmata of active bleeding.

## Questions:

* 1. Discuss mechanism of HCl secretion by the stomach.
  2. What is hematemesis? What is hemoptysis?
  3. What are the causes of PUD?
  4. How does patient with PUD present?
  5. What are the complications of PUD?
  6. How to diagnose PUD?
  7. What is role of H.pylori in the pathogenesis of PUD?
  8. How to diagnose H.pylori infection?
  9. What is the role of NSAIDs in the pathogenesis of PUD?
  10. How to treat H.pylori infection?
  11. How to treat and prevent NSAIDs –related?

## Case of Liver Cirrhosis

A 65 year old man presents with fatigue and increased sleeplessness started 2 years ago. 25 years ago he was involved in a road traffic accident and was hospitalized for 10 days, during which he received 3 units of blood transfusion. He is currently on no medication, and denies any alcohol consumption, drug abuse or sexual misconduct. On examination, he is overweight but looks lethargic with mild swelling of the ankles and feet. Abdominal exam revealed splenomegaly, and positive for ascites.

His laboratory tests showed: Hemoglobin 9 g% (N=12-14 g%), Platelets count =79000/μl (N:150000-300000/μl, albumin=28 gm/L (N: 38-40 gm/L), bilirubin = 2.5 mg% (N=0.5-1 mg%), ALT=98 U/L (N: up to 30 U/L), AST=77 U/L (N- up to 33 U/L), Prothrombin time 45 second, INP (international normal ratio) = 1.7 (N=1). Abdominal ultrasonagraphy showed coarse liver texture and nodularity with some ascites.

Questions:

* 1. Discuss the gross anatomy of the liver.
  2. Discuss microscopic anatomy of the liver.
  3. Discuss the blood supply and venous drainage of the liver.
  4. What is the mostly likely cause of the liver disease in this patient?
  5. What is the definition of cirrhosis?
  6. What are the causes of the liver cirrhosis?
  7. What are the complications of liver cirrhosis?
  8. What is ascites? How does it develop?
  9. What is esophageal varices?
  10. What is hepatic encephalopathy?
  11. What is the treatment of decompensated liver cirrhosis?

## Case of Perforated Gastric ulcer History

A 42 year old female was admitted to the hospital after visiting the emergency room complaining of severe epigastric pain and pain over her right shoulder. She had a history of gastric ulcer which had been treated previously with medication, but on questioning, she admitted that she had been so busy recently that she had forgotten to refill her prescription and had not taken her medication in some time. As a result of the history and physical findings, the physician suspected that she was suffering from a perforated gastric ulcer and she was referred to surgical department. When the surgeon examined the patient's stomach during the surgery, she found a small perforation on the posterior aspect of the body of the stomach near the lesser curvature. The perforation was repaired and, in addition, a vagotomy was performed. During the vagotomy, the surgeon found it necessary to cut the left gastric artery and ligate it.

Questions to consider:

1. What structures are at risk for damage by gastric juices if a perforation like the one described above occurs?
2. Why did the patient experience pain over her shoulder as well as in her abdomen?
3. What is a vagotomy and why was it performed?
4. Since the left gastric artery had to be ligated during the surgery, how will the stomach obtain an adequate blood supply?
5. Variations in the arteries of the celiac trunk are quite common, and thus are of particular interest to surgeons working in this area. Suppose the common hepatic artery originated from the left gastric artery in this case (an uncommon, but possible, variation) and the surgeon had to ligate the left gastric artery proximal to the bifurcation. How would this affect blood flow to the stomach? to other organs?

## Case of Alcohol Misuse (alcohol and the digestive tract) History

**Chief Complaint:** 62-year-old man with esophageal bleeding

History: Amjad Ali, a 62-year-old accountant, has had a "drinking problem" throughout most of his adult life. He drinks about a half-case of beer each day. He has lost several jobs over the years for drinking at the workplace or showing up for work drunk. He lost his driver's license for drunk-driving, and his drinking has placed a considerable strain on his marriage. He has been hospitalized on several occasions over the years. Amjad has a severe tremor in his hands (probably a result of excessive alcohol intake), which makes it very difficult for him to use a spoon, fork, and knife to eat.

## His past medical records showed theses notes First Hospitalization:

You note that Amjad was hospitalized at age 32 with a complaint of vomiting up blood after a drinking binge that lasted seven days and was marked by excessive and repeated vomiting episodes. The vomitus was bright red.

The hospital chart lists a diagnosis of "Upper GI bleed" due to a Mallory-Weiss tear. You look up "Mallory-Weiss tear" in an internal medicine textbook and see that it is defined as "a longitudinal tear in the mucosa at the gastroesophageal junction -- i.e. in the area of the lower esophageal sphincter -- caused by repeated vomiting."

Questions:

* 1. Why was the blood bright red, rather than the color of "coffee grounds"?
  2. Based upon your knowledge of the vomiting reflex, why might severe vomiting tear the mucosa?

## Second Hospitalization:

At age 36, Amjad was hospitalized again, this time with complaints of abdominal pain in the upper epigastric region (i.e. just below the xiphoid process of the sternum) and "coffee- grounds" emesis. He also complained of "heartburn" (a burning sensation in the area of the sternum) which was partially relieved with antacids. A diagnosis of "upper GI bleed due to gastritis and reflux esophagitis" is noted in the chart.

Questions:

1. What is causing the pain in the upper epigastric region ? What barrier(s) normally protect the stomach lining from its own acid?
2. What is reflux esophagitis?
3. Can you think of any treatments for Amjad's problems? Explain the mechanisms for those treatments, based upon your knowledge of the regulation of gastric secretions.

## Third Hospitalization:

At age 41, Amjad entered the hospital with complaints of a high fever, nausea, loss of appetite, and a dull, continual pain in the left side of the back. In addition, he had diarrhea of a particularly foul odor and yellow color . He had also lost 15 pounds over the last month and a half. Unfortunately, the page in the chart is torn, so you cannot read the diagnosis! But your memory of an anatomy and physiology course you took in college helps you figure out the possible causes of Amjad's problem.

Questions:

1. Excessive exposure to alcohol can cause inflammation of certain digestive organs, such as the stomach. Inflammation of which organ(s) might be causing Amjad's back pain?
2. Based upon the function of the organ in question, what is causing the "steatorrhea" and weight loss?

## Fourth Hospitalization:

As you read on, you note that Amjad was hospitalized again at age 49 with dull pain in the right, upper quadrant of the abdomen, intermittent fever of 3 weeks duration, and a yellowing of the skin and the whites of the eyes. A diagnosis of "alcohol-induced hepatitis" is listed in the chart. Questions:

1- Is the diagnosis consistent with the location of the abdominal pain? Explain your answer. 2- How are the liver and gallbladder connected to each other and to the duodenum?

1. If Amjad's liver disorder resulted in the production of a "gallstone," what danger might that present for his pancreas?
2. Why are Amjad's skin and eyes tinged yellow? What is this condition called?

## Fifth Hospitalization:

At age 58, Amjad was rushed to the emergency room with severe vomiting of bright red blood. On examination, he had a blood pressure of 60 mmHg / 30 mmHg. The bleeding and vomiting started abruptly while Amjad was eating some hard, dry French bread. An endoscope (i.e. a flexible tube equipped with a camera) was placed down Amjad's esophagus, and a diagnosis of esophageal varices was quickly made.

Questions:

1. What are esophageal varices?
2. Where are esophageal varices typically located? (Be specific.)
3. On the hospital chart you see two other "secondary diagnoses" listed:
   1. cirrhosis of the liver, and (2) portal hypertension.
4. Does this additional information help explain why Amjad developed esophageal varices? Explain your answer.
5. Why is bleeding particularly dangerous for Amjad?

**Summary of the teaching activities in the GIT System**

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| --- | --- | --- | --- |
| **Department** | **# of Lectures** | **# of Practical** | **Small Group Discussion** |
| **Anatomy** | 12 | 5 | 0 |
| **Physiology** | 9 | 0 | 0 |
| **Biochemistry** | 4 | 0 | 0 |
| **Pathology** | 16 | 4 | 0 |
| **Microbiology** | 9 | 1 | 0 |
| **Pharmacology** | 6 | 1 | 0 |
| **Public Health** | 2 | 0 | 0 |
| **Multidisciplinary** | 2 | 0 | 2 |
| **Total** | 60 | 11 | 2 |