In the Name of God

Course Title and Code: Gastrointestinal Physiology – Code 116 **Program & Degree: Medicine – Doctor of Medicine (M.D.)** **Semester: 2**

Offered Semester: First and Second **Weekly Schedule: Tuesday 14:00–16:0** **Location: Faculty of Medicin**

Number and Type of Credits (Theoretical / Practical): 0.8 (0.6 theory and 0.1 practical) **Theoretical Prerequisite Courses: None**

Course Instructor: Dr. Elham Karimi-Sales **Contact Number: +98 41 33364664**

Session 1 **General Objective:** Overview of the Regulation of the Gastrointestinal System							
Specific Objectives	**Learning Domain**	**Instructor Activity**	**Student Activity**	**Learning Environment**	**Duration**	**Evaluation Method**	**Teaching Aids**
At the end of this session, the student is expected to be able to: -Explain the hormonal regulation of the gastrointestinal system. -Describe the role of the autonomic nervous system in gastrointestinal regulation. -Describe the enteric nervous system and its components. -Explain the concept of slow waves. -Identify the types and composition of salivary glands. -Explain the difference between primary and secondary saliva secretion.	Cognitive (Knowledge)	-Lecture with encouragement of student participation -Active participation and class discussion	Active participation	Classroom	90 minutes	Final MCQ exam	Video projector (PowerPoint) Whiteboard

Session 2 **General Objective:** Propulsion and Mixing of Food in the Alimentary Tract, Secretion of Saliva							
Specific Objectives	**Learning Domain**	**Instructor Activity**	**Student Activity**	**Learning Environment**	**Duration**	**Evaluation Method**	**Teaching Aids**
At the end of this session, the student is expected to be able to: -Explain the mechanism of chewing in the mouth and its importance and control. -Describe the different stages of swallowing and explain its control mechanisms. -State the role of the upper and lower esophageal sphincters and explain the concepts of reflux and achalasia. -Describe the movements of the stomach and list the factors affecting the rate of gastric emptying. -Explain the types of small intestinal movements and the role of each in facilitating digestion and absorption of nutrients in the small intestine. -Describe the movements of the large intestine and explain their functions.	Cognitive (Knowledge)	-Lecture with encouragement of student participation -Active participation and class discussion	Active participation	Classroom	90 minutes	Final MCQ exam	Video projector (PowerPoint) Whiteboard

-Explain the defecation reflex and identify the centers involved in its control. -Identify the types and composition of salivary glands. -Explain the difference between primary and secondary saliva secretion.							

Session 3 **General Objective:** Secretory Functions of the Alimentary Tract							
Specific Objectives	**Learning Domain**	**Instructor Activity**	**Student Activity**	**Learning Environment**	**Duration**	**Evaluation Method**	**Teaching Aids**
At the end of this session, the student is expected to be able to: -Identify the secretory cells of the stomach and list the different gastric secretions. -Explain the different stages of gastric acid secretion stimulation. -Name the types of exocrine pancreatic secretions and explain the role of each. -Describe the components of bile, explain the importance of each, and describe the enterohepatic circulation. Explain the secretions of the small and larg intestines.	Cognitive (Knowledge)	-Lecture with encouragement of student participation -Active participation and class discussion	Active participation	Classroom	90 minutes	Final MCQ exam	Video projector (PowerPoint) Whiteboard

Session 4 **General Objective:** Digestion and Absorption in the Gastrointestinal Tract							
Specific Objectives	**Learning Domain**	**Instructor Activity**	**Student Activity**	**Learning Environment**	**Duration**	**Evaluation Method**	**Teaching Aids**
At the end of this session, the student is expected to be able to: -Define the concept of resting membrane potential. -Explain the Nernst and Goldman–Hodgkin–Katz relationships. -Describe the mechanisms of depolarization and repolarization. -Identify the types of ion channels in the axonal membrane and explain the state of their gates in different phases of action potential. -Define and explain the concepts of excitation threshold, hyperpolarization, and their mechanisms of generation. -Explain the all-or-none law. -Distinguish between myelinated and unmyelinated nerve fibers	Cognitive (Knowledge)	-Lecture with encouragement of student participation -Active participation and class discussion	Active participation	Classroom	90 minutes	Final MCQ exam	Video projector (PowerPoint) Whiteboard

Session 5 **General Objective:** Digestion and Absorption in the Gastrointestinal Tract							
Specific Objectives	**Learning Domain**	**Instructor Activity**	**Student Activity**	**Learning Environment**	**Duration**	**Evaluation Method**	**Teaching Aids**
At the end of this session, the student is expected to be able to: -Explain the stages of carbohydrate digestion in gastrointestinal tract. -Explain the mechanism of carbohydrate absorption in the small intestine. -Explain the stages of protein digestion in gastrointestinal tract. -Describe the mechanism of protein absorption in the small intestine. -Explain the stages of fat digestion in gastrointestinal tract. -Describe the mechanism of fat absorption in the small intestine. -Describe the absorption of ions (iron, calcium, sodium, chloride, potassium, bicarbonate, etc.) in the gastrointestinal tract. -Describe the role of the large intestine in the absorption of water and electrolytes.	Cognitive (Knowledge)	-Lecture with encouragement of student participation -Active participation and class discussion	Active participation	Classroom	90 minutes	Final MCQ exam	Video projector (PowerPoint) Whiteboard

Session 1-Practical **General Objective:** Basal Metabolism							
Specific Objectives	**Learning Domain**	**Instructor Activity**	**Student Activity**	**Learning Environment**	**Duration**	**Evaluation Method**	**Teaching Aids**
At the end of this session, the student is expected to be able to: -Define basal metabolic rate. -Identify direct and indirect methods of BMR measurement. -Describe the procedure for indirect measurement of BMR. -Perform calculations related to indirect BMR measurement.	-Cognitive (Knowledge) and Psychomotor	-Lecture with encouragement of student participation -practical work	-Active participation -Experimental performance and calculations	Physiology Laboratory	90 minutes	Practical exam for psychomotor domain; MCQ and written exam for cognitive domain	Video projector (PowerPoint) Whiteboard Required equipment for experiments

Course Policies

- **Absence and Tardiness:** According to regulations, students cannot miss any session except for justified absences (up to 4/17 of total class hours).
- **Assessment and Grading:**
    - Theoretical and Practical exam: 20 points (MCQs).
    - Additional points (beyond the total of 20) may be granted for regular attendance, active class participation, and completion of optional assignments.

References:

Theoretical Course:

- *Guyton and Hall Textbook of Medical Physiology* (latest edition)
- *Ganong's Review of Medical Physiology* (latest edition)

Practical Course:

- *Practical Physiology* (authored by the Department of Physiology faculty, available in the department laboratory)