



Faculty of Physical Education and Sport Sciences

Dept. of Exercise Physiology

Module code: 97181621

Module name: Human Physiology

Module Pre-requisite: ----

Module Coordinator/s: Prof. Vahid Sari-Sarraf

Assessment due date: Follow the University calendar

Credit: 2/ 32 h

On successful completion of this module, students should be able to appreciate:

Week 1: Cell

1. Functional Organization of the Human Body and Control of the “Internal Environment”
2. The Cell and Its Functions
3. Genetic Control of Protein Synthesis, Cell Function, and Cell Reproduction
4. Transport of Substances Through Cell Membranes

Week 2: Smooth muscle

1. Membrane Potentials and Action Potentials
2. Excitation and Contraction of Smooth Muscle

Week 3&4: Skeletal muscle

1. Contraction of Skeletal Muscle
2. Excitation of Skeletal Muscle: Neuromuscular Transmission and Excitation-Contraction Coupling

Week 5&6: **Cardiac Muscle**

1. The Heart as a Pump and Function of the Heart Valves
2. Rhythmical Excitation of the Heart
3. Fundamentals of Electrocardiography
4. Electrocardiographic Interpretation of Cardiac Muscle and Coronary Blood Flow Abnormalities: Vectorial Analysis

Week 7&8: **Blood circulation**

1. Pressure, Flow, and Resistance
2. Vascular Distensibility and Functions of the Arterial and Venous Systems
3. The Microcirculation and Lymphatic System: Capillary Fluid Exchange, Interstitial Fluid, and Lymph Flow
4. Local and Humoral Control of Tissue Blood Flow
5. Nervous Regulation of the Circulation and Rapid Control of Arterial Pressure
6. Role of the Kidneys in Long-Term Control of Arterial Pressure and in Hypertension: The Integrated System for Arterial Pressure Regulation
7. Cardiac Output, Venous Return, and Their Regulation

Week 9: Assessment

Week 10 & 11: **Kidneys**

1. The Urinary System: Functional Anatomy and Urine Formation by the Kidneys
2. Glomerular Filtration, Renal Blood Flow, and Their Control
3. Renal Tubular Reabsorption and Secretion
4. Urine Concentration and Dilution; Regulation of Extracellular Fluid Osmolarity and Sodium Concentration
5. Renal Regulation of Potassium, Calcium, Phosphate, and Magnesium; Integration of Renal Mechanisms for Control of Blood Volume and Extracellular Fluid Volume
6. Acid–Base Regulation

Week 12: **Blood**

1. Red Blood Cells, Anemia, and Polycythemia
2. Resistance of the Body to Infection: I. Leukocytes, Granulocytes, the Monocyte Macrophage System, and Inflammation
3. Resistance of the Body to Infection: Immunity and Allergy
4. Blood Types; Transfusion; and Tissue and Organ Transplantation
5. Hemostasis and Blood Coagulation

Week 13: **Respiratory system**

1. Pulmonary Ventilation
2. Pulmonary Circulation, Pulmonary Edema, and Pleural Fluid
3. Principles of Gas Exchange; Diffusion of Oxygen and Carbon Dioxide Through the Respiratory Membrane
4. Transport of Oxygen and Carbon Dioxide in Blood and Tissue Fluids

5. Regulation of Respiration
- 6.

Week 13: Nervous system

1. Spinal Cord Motor Functions; the Cord Reflexes
2. Cortical and Brain Stem Control of Motor Function
3. Cerebellum and Basal Ganglia Contributions to Overall Motor Control

Week 14: Gastrointestinal system

1. General Principles of Gastrointestinal Function—Motility, Nervous Control, and Blood Circulation
2. Propulsion and Mixing of Food in the Alimentary Tract
3. Secretory Functions of the Alimentary Tract
4. Digestion and Absorption in the Gastrointestinal Tract

Week 15: Body temperature

1. Body Temperature Regulation

Week 16: Endocrinology

1. Introduction to Endocrinology

Week 17: Final Exam

Note: Compensatory sessions will be held virtually by prior appointment.

Teaching and Learning Methods: Lectures, community based learning, practical classes (role play)

Assessment Details

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Presentation	Role Play		15%	TBC
Fieldwork	Laboratory works, Journal Search		5%	7, each week
Final Exam			80%	17

Note: To pass this module overall-a pass must be obtained in both the service learning component and the end of semester exam.

Reference:

1. Guyton and Hall (2020): Textbook of Medical Physiology (14th Edition). Elyse O’Grady

Recommended articles List:

