

Course E-Syllabus

1	Course title	Physiology
2	Course number	0344363
3	Credit hours	4
	Contact hours (theory, practical)	3+3
4	Prerequisites/corequisites	Biology 102
5	Program title	Bachelor of Biological Sciences
6	Program code	0304
7	Awarding institution	The University of Jordan
8	School	Science
9	Department	Dept of Biological Sciences
10	Level of course	3 rd year
11	Year of study and semester (s)	3 rd year, Fall and Spring
12	Final Qualification	Biological sciences
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Teaching methodology	<input type="checkbox"/> Blended <input checked="" type="checkbox"/> Online
16	Electronic platform(s)	<input checked="" type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input checked="" type="checkbox"/> Zoom <input type="checkbox"/> Others.....
17	Date of production/revision	October, 2020

18 Course Coordinator:

Prof. Shtaywy S. Abdalla Office No.: 309 Office Hour: Sunday and Tuesday 11:00 - 12:00 Email address: shtaywy@ju.edu.jo
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19 Other instructors:

<i>Name:</i> <i>Office number:</i> <i>Phone number:</i> <i>Email:</i> <i>Name:</i> <i>Office number:</i> <i>Phone number:</i> <i>Email:</i>
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20 Course Description:

Basic mechanisms of human physiology: Homeostasis, signal transduction, nervous system, sensory systems, muscle, endocrine physiology, cardiovascular physiology, respiration, renal physiology and body fluid regulation.

21 Course aims and outcomes:

A- Aims:

- Explain the principles of homeostasis and negative feedback control, and provide specific examples.
- Understand the physiological functions of the major classes of biomolecules.
- Relate biological structure to function at different levels of biological organization.
- Describe the mechanisms of action of nerve and muscle cells.
- Explain mechanisms of cell signaling in the nervous, sensory, and endocrine systems.
- Outline the functions of the major organ systems of the body and provide examples of coordinated interactions among these systems.

B- Intended Learning Outcomes (ILOs):

Upon successful completion of this course, students will be able to:

<p>A. Knowledge and Understanding Skills: Student is expected to</p> <p>A1- Describe some biophysical laws and their relation to human physiology.</p> <p>A2- Describe the cellular functions at the organelle and molecular level.</p> <p>A3- Discuss regulation of extracellular fluid composition and volume</p> <p>A4- Point out the basis of excitability (membrane potentials) in all living cells especially in nerve and muscle cells.</p> <p>A5- Explain the functions of the nerve cell and muscle fiber grossly and at the molecular level.</p> <p>A6- Classify the functional organization of sympathetic and parasympathetic nervous systems</p> <p>A7- Describe the organization and function of the endocrine system and explain its role in regulating homeostasis of the human body</p> <p>A8- describe the structure, properties and functions of muscles grossly and at the molecular level.</p> <p>A9- Describe the organization and function of the cardiovascular system</p> <p>A10 - Point out the functional anatomy of the kidney, physiology of glomerular filtration, renal tubular function and micturition.</p> <p>A11 - describe the physiology of pulmonary ventilation, exchange of gases in the lung, and blood gas transport.</p> <p>A12- Describe the organization and function of the digestive system</p>
<p>B. Intellectual Analytical and Cognitive Skills: Student is expected to</p> <p>B1- Evaluate the normal functions of different components of mentioned systems, and the effect of their disturbances.</p>
<p>C. Subject- Specific Skills: Student is expected to</p> <p>C1- Suggest the basic physiological measurements used to test different system functions.</p> <p>C2- Interpret the most important physiological laboratory results, and distinguishes between physiological and pathological performance of different body systems.</p>
<p>D. Creativity /Transferable Key Skills/Evaluation: Student is expected to</p> <p>D1- Work effectively within a team</p> <p>D2- Participate effectively in group discussion or debates and Report practical procedures in a clear and concise manner.</p>

22. Topic Outline and Schedule:

Week	Lecture	Topic	Teaching Methods*/platform	Evaluation Methods**	References
1	1.1	Introduction Homeostasis: A Framework for Human Physiology 1.1 The Scope of Physiology 1.2 How is the Body Organized?	Asynchronous Lecturing using Audio and Video and Powerpoint/Zoom/ Moodle	Exams, Homework, and laboratory reports	Vander's Human physiology 2019 Chapter 1
	1.2				
	1.3				
2	2.1				

		1.3 Body Fluid compartments 1.4 Homeostasis: A Defining Feature of Physiology 1.5 General Characteristics of Homeostatic Control Systems 1.6 Components of Homeostatic Control 1.7 The Role of Intercellular Chemical Messengers in Homeostasis 1.8 Processes Related To Homeostasis 1.9 General Principles of Physiology			
	2.2	Control of Cells by Chemical Messengers 5.1 Receptors 5.2 Signal Transduction Pathways	Lecturing using Audio and Video and Powerpoint/Zoom/Moodle		Chapter 5
	2.3			Exams, Homework, and laboratory reports	
3	3.1	Neuronal Signaling and the Structure of the Nervous System	Lecturing using Audio and Video and Powerpoint/Zoom/Moodle	Exams, Homework, and laboratory reports	Chapters 6 and 7
	3.2				
	3.3				
4	4.1	Neural Tissue 6.1 Structure and Maintenance of Neurons 6.2 Functional Classes of Neurons 6.3 Glial Cells 6.4 Neural Growth & Regeneration	Lecturing using Audio and Video and Powerpoint/Zoom/Moodle	Exams, Homework, and laboratory reports	Chapters 6 and 7
	4.2				
	4.3				
5	5.1	Membrane Potentials 6.5 Basic Principles of Electricity 6.6 The Resting	Lecturing using Audio and Video and Powerpoint/Zoom/Moodle	Exams, Homework, and laboratory reports	Chapters 6 and 7
	5.2				

		Membrane Potential 6.7 Graded Potentials and Action Potentials <u>Synapses</u> 6.8 Functional Anatomy of Synapses 6.9 Mechanisms of Neurotransmitter Release 6.10 Activation of the Postsynaptic Cell 6.11 Synaptic Integration 6.12 Synaptic Strength 6.13 Neurotransmitters and Neuromodulators 6.14 Neuroeffector Communication <u>Sensory Systems</u> 7.1 Receptor potential and general characteristics 7.3 Vision			
	5.3	Muscle 9.1 Structure 9.2 Molecular Mechanisms of Skeletal Muscle Contraction 9.3 Mechanics of Single-Fiber Contraction 9.4 Skeletal Muscle Energy Metabolism 9.6 Whole-Muscle Contraction		Exams, Homework, and laboratory reports	Chapter 9
6	6.1				
	6.2	The Endocrine System <u>Principles of Hormonal Control Systems</u> 11.1 Hormones and Endocrine Glands		Exams, Homework, and laboratory reports	Chapter 11
	6.3				
	7.1				
7	7.2				

		11.2 Hormones Structures and Synthesis 11.3 Hormone Transport in the Blood 11.4 Hormone Metabolism and Excretion 11.5 Mechanism of Hormone Action 11.6 Inputs that Control Hormone Secretion 11.7 Types of Endocrine Disorders <u>The Hypothalamus and Pituitary Gland</u> 11.8 Control Systems Involving the Hypothalamus and Pituitary <u>The Thyroid Gland</u> 11.9 Synthesis of Thyroid Hormone 11.10 Control of Thyroid Function 11.11 Actions of Thyroid Hormone <u>The Endocrine Response to Stress</u> 11.13 Physiological Functions of Cortisol 11.14 Functions of Cortisol in Stress 11.15 Adrenal Insufficiency and Cushing's Syndrome 11.16 Other Hormones Released During Stress		
	7.3			
8	8.1	Cardiovascular Physiology Overview of the Circulatory	Exams, Homework, and laboratory reports	Chapter 12
	8.2			Chapter 12
	8.3			

9	9.1	System			
	9.2	12.1 Components of the Circulatory System			
	9.3	12.2 Pressure, Flow, and Resistance The Heart 12.3 Anatomy 12.4 Heartbeat Coordination 12.5 Mechanical Events of the Cardiac Cycle 12.6 The Cardiac Output 12.7 Measurement of Cardiac Function Integrative Cardiovascular Function: Regulation of Systemic Arterial Pressure 12.13 Baroreceptor Reflexes			
10	10.1	13.1 Organization of the Respiratory System		Exams, Homework, and laboratory reports	Chapter 13
	10.2	13.2 Ventilation and Lung Mechanics			
	10.3	13.3 Exchange of Gases in Alveoli and Tissues 13.4 Transport of Oxygen in Blood 13.5 Transport of Carbon Dioxide in Blood 13.6 Transport of Hydrogen Ions Between Tissues and Lungs 13.7 Control of Respiration			
11	11.1	The Kidneys and Regulation of Water and Inorganic Ions		Exams, Homework, and laboratory reports	Chapter 14
	11.2				
	11.3				
12	12.1	Basic Principles of Renal Physiology			
	12.2				
	12.3				

		14.1 Renal Functions 14.2 Structure of the Kidneys and Urinary System 14.3 Basic Renal Processes 14.4 The Concept of Renal Clearance 14.5 Micturition <u>Regulation of Ion and Water Balance</u> 14.6 Total-Body Balance of Sodium and Water 14.7 Basic Renal Processes for Sodium and Water 14.8 Renal Sodium Regulation 14.9 Renal Water Regulation 14.12 Potassium Regulation 14.13 Renal Regulation of Calcium and Phosphate Ion			
13	13.1 13.2 13.3	The Digestion and Absorption of Food		Exams, Homework, and laboratory reports	Chapter 15
14	14.1 14.2 14.3	15.1 Overview of the Digestive System 15.2 Structure of the Gastrointestinal Tract Wall 15.3 General Functions of the Gastrointestinal and Accessory Organs 15.4 Digestion and Absorption 15.5 How Are Gastrointestinal Processes Regulated?			

- Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
- Evaluation methods include: Homework, Quiz, Exam, pre-lab quiz...etc

23 Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Written exams, homework and laboratory reports, pre-lab quiz.

24 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

25 Course Policies:

A- Attendance policies:

Students are allowed to not attend seven lectures (15%) in the whole semester. In this case, students must attend every lab weekly. If a student does not attend a lab, then he/she has a maximum number of four lectures to skip.

B- Absences from exams and handing in assignments on time:

If a student does not attend an exam, he/she will get zero grade in that exam, unless, he/she shows a medical report that proves he/she could not attend the exam. In this case, a makeup exam will be offered to the student as soon as possible.

C- Health and safety procedures:

Students need to be aware of the basic procedure of laboratory safety. Part of the first lab in the first week of the semester is assigned to teach students these basic laboratory procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

University regulations will be implemented for any cheating attempt, plagiarism and misbehavior.

E- Grading policy: As Dictated by University rules

F- Available university services that support achievement in the course: Library, Laboratory, Internet, E-learning University website

26 References:

A- Required book(s), assigned reading and audio-visuals:

Widmaier, E.P., Raff, H. and Strang, K. T. Vander's Human Physiology The Mechanisms of Body Function, 15th Ed. New York, McGraw-Hill, 2019.

Laboratory Manual

B- Recommended books, materials and media:

27 Additional information:

Name of Course Coordinator: Professor Shtaywy Abdalla -Signature: ---(signed)-- Date: 27.10.2020

Head of Curriculum Committee/Department: -?-- Signature: -----

Head of Department: -Dr. Hanaa Elabous---- Signature: -----

Head of Curriculum Committee/Faculty: -----?----- Signature: -----

Dean: -----Professor Fuad Kettaneh----- Signature: -----