Syllabus: Physiology (#131702252)
First Semester 202../202..

COURSE INFORMATION	
Course Name: Physiology (blended education) **Semester:** First/Second **Department:** Clinical Pharmacy & Pharmacy Practice **Faculty:** Pharmaceutical Sciences	**Course Code:** 131702252 **Section:** As per semester **Core Curriculum**: 2013 Study Plan **JNQF Level**: 7
Day(s) and Time(s): According to HU courses timetable/semester **Classroom:** As per semester	**Credit Hours:** 4 **Prerequisites**: 131702251 (Anatomy)

COURSE DESCRIPTION

The course is lecture-based. Physiology is discussed using a systemic approach. Each human body unit will be addressed from a structural and functional basis.

This course is designed to provide students with an understanding of the human body's function and regulation and the physiological integration of the organ systems to maintain homeostasis. Course content will include neural and hormonal homeostatic control mechanisms and a study of the musculoskeletal, circulatory, respiratory, digestive, urinary, immune, reproductive, and endocrine organ systems.

DELIVERY METHODS

The course will be delivered using a combination of active learning strategies, and students will be encouraged to participate actively in the learning process.

These include:

- PowerPoint lectures and active classroom-based discussion.

- Students are encouraged to participate actively in the learning process. Lectures start with questions about the student's prior knowledge of the topic and/or the previous lecture. Other questions are asked at the end of the lecture to gain insight into the students' competencies (to verify whether students have completely understood the topic). In addition, the topic's main ideas during a lecture should be connected between this course and subsequent courses. This will help students understand why they are taking these courses according to the core curriculum in a specific order.
- Video lectures on YouTube or animation shows to have a complete picture of the pathogenesis stages of certain diseases.
- Sound recordings of lectures; thus, students can return and listen to them as much as they need.

FACULTY INFORMATION

Names	**1- Dr. Amjad Zuhier Salem Alrosan** **2- Dr. Abdelrahim Mohammed Abdelrahim Alqudah**
Academic Title:	**Assistant Professors**
Office Location:	**Third Floor**
Telephone Number:	**Extensions:**
Email Address:	**1- amjadz@hu.edu.jo** **2- abdelrahim@hu.edu.jo**
Office Hours:	**As announced per semester** ***Please send an e-mail (as mentioned above) to meet at any other time.***

REFERENCES AND LEARNING RESOURCES

Required Textbook: **Principles of Anatomy and Physiology**

Gerard J. Tortora, Bryan H. Derrickson, Principles of Anatomy and Physiology, 16th Edition, 2020, ISBN: 9781119662686

COURSE OBJECTIVES

After course completion, students will be able to:

1. The main goal of this course is to present the function of the human body's major organs and organ systems (the unique role of each organ and organ system in maintaining health). Demonstrate knowledge of organ systems function and cellular function.
2. Understand the contractile mechanisms of skeletal and smooth muscle cells.
3. Classify the functional organization of the autonomic nervous system (ANS) and its general effects on the body systems, besides studying the neurotransmitters and functional receptors of the system.
4. Understand blood cells and body fluids' composition and functions of all these elements.
5. Understand the mechanisms of heart functions, including heart muscle, conductive tissues, and vessels and their hemodynamics.
6. Demonstrate pulmonary mechanics, gas transport and exchange, and ventilation regulation.
7. Explain the physiological basis and regulation of gastrointestinal secretion, motility, and absorption. Demonstrate endocrine hormones, types, secretion, mechanisms of action, significant functions, and their regulation.
8. Define the functionality of the urinary and reproductive systems.

COURSE INTENDED LEARNING OUTCOMES (CILOs)

A. Foundational Knowledge

A.1 Define the role of the plasma membrane in excitable tissues, changes in ion currents according to membrane potentials, and potential alterations in transport mechanisms. Students can integrate physiology from the cellular and molecular levels into the organ system.

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A.2 Describe the functions of each primary organ and, when appropriate, include the role of physiological functional units. Thus, students will be able to develop a vocabulary of terminology to communicate information effectively for topics related to human physiology and the following courses according to the core curriculum, including pathophysiology and pharmacology.

A.3 Recognize the principle of homeostasis and how feedback systems (central nervous system and endocrine systems as controlling centers) control the physiological processes in the human body. Students will be able to recognize the physiological connections within and between the systems of the human body, using anatomical knowledge to predict physiological responses and knowledge of physiology to predict the variations of anatomical structures.

A.4 Define the contractile mechanics of skeletal and smooth muscle fibers. Additionally, students

can define the cardiovascular system, explicitly emphasizing the physiology of the heart ("cardio") and the blood vessels ("vascular"). Thus, students will be able to know how the cardiovascular system reacts to various stimuli to modulate the speed and amount of blood flow through the arteries. Additionally, students can define the principal processes of the gastrointestinal system, including the ingestion and digestion of food, absorption of nutrients, secretion of fluids and enzymes, and excretion of waste items. Students can also define all the methods and components of gas exchange inside the respiratory system and the transfer between the atmosphere and physiological tissues.

A.5 Recognize functional changes in the endocrine system and physiologic responses to various hormones. Moreover, students can recognize functional changes in the urinary system by studying glomerular filtration, nephron function, and endocrine regulation of the kidney (how we can recognize patients having problems with the functionality of kidneys or urinary system through blood tests) and urine analysis). Also, students can recognize functional changes in the reproductive system and fertility (in addition to how we can solve fertility issues).

A.6 Describe scientific information and understand how changes to anatomy and physiology could result in homeostatic imbalance.

B. Essentials for Practice and Care

B.1 Analyze the connection of physiology with pharmacology.

B.2 Discuss with students their future roles as pharmacists and healthcare providers (influencing medicine optimization, safety, efficacy, and cost-effectiveness of medication use, etc.).

C. Approach to Practice and Care

C.2 Demonstrate students in enduring ways (i.e., medical databases) about imparting the most accurate information.

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect theirability to participate in course activities or meet course requirements. Students with disabilities areencouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

Special Needs Section:

Tel: 00962-5-3903333 Extension: 4209

Location: Students Affairs Deanship/ Department of Student

Welfare Services Email: amalomoush@hu.edu.jo
amalomoush@staff.hu.edu.jo

COURSE REGULATIONS

Participation

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance*. It is a student's responsibility to monitorthe frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed bythe University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

Sharing of course materials is forbidden. No course material including, but not limited to, course outline, lecture hand-outs, videos, exams, and assignments may be shared online or with anyone outside the class. Any suspected unauthorized sharing of materials will be reported to the university's Legal Affairs Office. If a student violates this restriction, it could lead to student misconduct procedures.

Plagiarism

Plagiarism is considered a serious academic offense and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviours that compromise his/her own integrity as well as that of the Hashemite University.

Plagiarism includes the following examples, and it applies to all student assignments orsubmitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission orreference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without usingquotation marks.**
- **Misrepresentation of the sources that were used.**

The instructor has the right to fail the coursework or deduct marks where plagiarism isdetected

Student Complaints Policy

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you mayrefer to the students' handbook.

Others

- At the beginning of the lectures, be on time and don't leave before the end of the lecture withoutan acceptable excuse.
- If you missed a class, it is your responsibility to find out about any announcements orassignments you have missed.
- For any clarification, please communicate with your instructor at his posted office hours or byappointment.
- Switch off your mobile or keep it silent throughout the lecture.
- Listen well to the lecture and avoid side discussions, if you have a question, ask your instructorand not your colleague.
- Exams are scheduled to be given three times throughout the semester; you are expected to attend all. If not, make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.
- Cheating, academic misconduct, fabrication, and plagiarism will not be tolerated, and the university policy will be applied.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment:

Assessment	Grade Weighting	Deadline Assessment
First Exam	30%	~ 6th week
Second Exam	30%	~ 10th week
Final Exam	40%	~ 15th /16th week

Description of Exams

Test questions will predominately come from the material presented in the lectures. Semester exams will be conducted during the regularly scheduled

lecture period. The exam will consist of acombination of multiple-choice, true and false, and/or short answers.

No make-up exams will be given. Only documented absences will be considered as per HU guidelines. Make-up exams may be different from regular exams in content and format.

Grades are not negotiable and are awarded according to the following criteria*:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

"Lecture hours and weeks are approximate and may change as needed"
Note: For the 2 lecture periods per week (S/T, M/W), one lecture period covers 2 hours (120 minutes). The course contentspecifies chapters of the textbook that will be included in exams.

70% of the lectures are delivered by face-to-face learning.

Week number	No. of Hours	CILOs	Subject	Delivery methods	Assessment methods
1	**2**	**A C**	**<u>Introduction to Physiology</u>** 1. Cellular membranes and cellular organelles. 2. Transport of solutes and water. 3. Determinants of membrane potential. 4. Homeostasis.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant	-Exams. -Oral questions by choosing students to answer randomly (with no mark).

				Videos.	
2, 3	**8**	**A** **B**	**Nerve and Muscle Physiology** 1. Ultrastructure of nerve cells 2. Generation and conduction of action potential. 3. Ultrastructure of muscle cells. 4. Molecular mechanism of contraction.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
4	**2**	**A** **B**	**Autonomic Nervous System** 1. Sympathetic - function, origin, and transmitters. 2. Parasympathetic - function, origin, and transmitters. 3. Adrenal medulla.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
4, 5	**6**	**A** **B**	**Central Nervous System** 1. Organization of central nervous system. 2. Synaptic function. 3. Somatic sensation. 4. Motor system, (spinal cord, Brain stem, Basal ganglia, cerebellum, and motor cortex). 5. Higher cerebral cortical functions. 6. Reticular activity system, sleep, and wakefulness.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
6	**4**	**A** **B**	**Special Senses** 1. Vision – the structure of the eye. 2. Physics of Image Formation and its molecular consequences. 3. impulse conduction through optic nerve up to the cerebral cortex.	-Active Classroom-Based Discussions. -PowerPoint Lectures.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).

			4. Physiology of visual abnormalities. 5. Structure of the ear, and ultrastructure of the cochlea. 6. Sound waves transmission. 7. Conduction of impulse through auditory pathway up to the cerebral cortex. 8. Smell. 9. Taste.	-Relevant Videos.	
7, 8	**8**	**A** **B**	**<u>Cardiovascular System</u>** 1. Ultrastructure of cardiac muscle and, its physiology. 2. conduction system of the heart and, electrocardiography. 3. Heart as a pump and, cardia cycle. 4. Cardiac output, venous return, and its regulation. 5. Systemic circulation and, Hemodynamics. 6. Blood pressure, arterial, venous, and its control. 7. Tissue blood flow. 8. Cardiovascular control by the CNS.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
9	**4**	**A** **B**	**<u>Blood and Body Fluids</u>** 1. Extracellular fluid composition. 2. Intracellular fluid composition. 3. Intravascular fluid -blood volume and, composition. 4. Function of formed element of blood. 5. formation of formed elements of blood and, its regulation. 6. Homeostasis. 7. Plasma proteins.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
10	**4**	**A** **B**	**<u>Renal System</u>** 1. Nephron ultrastructure. 2. Glomerular function.	-Active Classroom-Based Discussions.	-Exams. -Oral questions

			3. Tubular mechanisms. 4. Renal regulation of extracellular fluid volume and, composition. 5. Concentration and dilution of urine - counter current mechanisms. 6. Renal regulation of acid-base balance.	-PowerPoint Lectures. -Relevant Videos.	by choosing students to answer randomly (with no mark).
11	**4**	**A** **B**	**<u>Respiratory System</u>** 1. Ventilation. 2. Mechanics of respiration. 3. Diffusion. 4. Pulmonary circulation. 5. Ventilation -perfusion relationship. 6. Gas transport. 7. Control of respiration.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
12	**4**	**A** **B**	**<u>Gastrointestinal System</u>** 1. Smooth muscle physiology. 2. Gastrointestinal motility, chewing, and swallowing. 3. Gastrointestinal secretions, including salivary, gastric, liver, and pancreatic. 4. Gastrointestinal digestion and, absorption. 5. Energy metabolism and, metabolic rate.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
13	**4**	**A** **B**	**<u>Endocrine System</u>** 1. General concepts of Endocrinology 2. Hypothalamic - pituitary axis - (Neuroendocrinology) 3. Pituitary gland - anterior and posterior. 4. Thyroid gland. 5. Adrenal cortex and, medulla. 6. Parathyroid and, calcium homeostasis.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).

			7. Endocrine pancreas and insulin disorders.		
14	**4**	**A** **B**	**<u>Reproductive System</u>** 1. Male gonads hormones and spermatogenesis. 2. Female gonads hormones, oogenesis, and, menstrual cycle. 3. Fertilization, implantation, and physiology of pregnancy and infertility.	-Active Classroom-Based Discussions. -PowerPoint Lectures. -Relevant Videos.	-Exams. -Oral questions by choosing students to answer randomly (with no mark).
15			University Final Exams		