Syllabus: Histology (#.....)

First/Second Semester: Second Semester 2023 /2024

COURSE INFORMATION	
Course Name: Histology (face-to-face education) Semester: Second Semester Department: biology Faculty: faculty of Science	**Course** Code: Section: Depending on the class schedule Core Curriculum: 2021 Study Plan
Day(s) and Time(s): Depending on the class schedule **Classroom: Biology dept.**	**Credit Hours: 3** **Prerequisites: .....**

COURSE DESCRIPTION

Lecture topics and laboratory experiences incorporate the basic topics in microscopic anatomy of the human body. The course deals with basic tissues (epithelium, connective tissue (including: adipose tissue, bone and cartilage), muscles and nerves) and body systems (respiratory, circulatory, urinary, digestive, lymphatic). In the lectures (2hour/week), the normal microscopic and submicroscopic structure of cells and tissues of the body are described and to relate these to functions of organs and systems. In Laboratory sessions (3hour/week), you will examine and analyze the materials being studied using both light and electron microscopy micrographs. Sets of specimens for each module are available to be examined under the compound microscope. Students should be able to differentiate the various histological structures from each other. Functional correlations often with some elements of clinical significance are presented throughout the course.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion.
  Students will be encouraged to participate and be actively involved in the learning process. Lectures will start with questions to inquire about the students' prior knowledge of the topic and/or about the previous lecture. Other questions will also be 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, connect the topic's main ideas during a lecture between this course and followed next courses, and this will help students to understand why they are taking these courses according to the core curriculum in a specific order.
- Video lectures on YouTube or animation shows
- Sound recordings of lectures and labs; thus, allow students to return and listen to them as much as they need.
- Allowing students to be teachers and communicate verbally with their colleagues. This will enhance their confidence; by giving the students a chance to present background topics in front of their colleagues.

FACULTY INFORMATION

Names	**Dr. Esam Qnais**
Academic Title:	**Professor**
Office Location:	Second Floor
Telephone Number:	
Email Address:	Esamqn@hu.edu.jo
Office Hours:	**Will be announced.** ***Please send an e-mail (as mentioned above) to meet at any other time on***

REFERENCES AND LEARNING RESOURCES

A- Required book (s), assigned reading and audio-visuals: Junqueira's Basic Histology, Text and Atlas, 14th edition, By Anthony L. Mescher B- Recommended books, materials, and media: Color Textbook of Histology, 4th edition, by Leslie P. Gartner and James L. Hiatt. Web based resources: http://www.histologyguide.org/index.html

INTENDED LEARNING OUTCOMES AND STUDENT LEARNING OUTCOMES

A- Aims: This Course aims to introduce undergraduate student to basic concepts of Human Histology, in addition to acquainting them with histological implications in medicine. The theoretical part of course will cover the epithelial, connective muscular and nervous tissues, and the histology of various systems with emphasis on their structure and function. The practical part of this course aims to allow students identify components of different tissues with concentration on how structures are adapted to perform the specific function.

B- Intended Learning Outcomes (ILOs): During learning of this course, students are expected to ……

A Knowledge and Understanding Skills: Student is expected to

A1. Distinguish the organization and structure of cells, tissues, and organs

A2. Identify the major epithelia (simple squamous, simple cuboidal, simple columnar, and stratified squamous), and know their locations and functions .within the body

A3- Describe and identify the major forms of the connective tissue.

A4 Describe the microscopic anatomy of compact and cancellous bone and the development stages from cartilage to bone tissue.

A5 Describe and identify the typical nerve cell body (nucleus, nissl bodies and axon hillock.(

A6 Describe the organization and structure of PNS & CNS

A7 Describe and differentiate the three major muscle tissue types (skeletal, smooth and cardiac) and identify the locations for each type of the muscular tissue within the body.

A8 Describe and differentiate the microscopic structures between the arteries, veins and capillaries, and their relation to the heart. Describe the microscopic anatomy of the heart walls and valves.

A9 Describe the structure of blood and differentiate the plasma, red blood cells, platelets, and lymph. Differentiate between the leukocytes by staining, nucleus, size, and relative abundance.

A10 Describe the microscopic structure of the lymphoid tissue

A11 Describe the microscopic structure and organization of the digestive tract.

 Describe the structure and functions of the pancreas and the liver as digestive Glands

A11 Describe the microscopic structure and organization of the urinary system.

A12 Describe the respiratory tract microscopic structures

A13. Describe the microscopic anatomy and functions of the endocrine system)Pituitary, Pancreas, Thyroid, Parathyroid, and Adrenal glands.(

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1 Explain the relationships of structure and function

B2. Identify components of different tissues with concentration on how structures are adapted to perform the specific function

C. Creativity /Transferable Key Skills/Evaluation: Student is expected to

C1 demonstrate critical thinking skills to describe possible pathologic outcomes of dysfunctional cells and
tissues
C2 develop communication skills by effective interaction with peers and academic staff
C3 deal with colleagues in an honorable and generous way

STUDENT LEARNING OUTCOMES MATRIX*

Core Curriculum Learning Outcomes	Program Learning Outcomes	Course Objectives	Course Student Learning Outcomes	Assessment Method
CC-LO-1 Foundational Knowledge	Biology -LO-1: Develop, integrate, and apply knowledge from the course foundational science to build upon it	1-Demonstrate knowledge of organ systems function and cellular function.	1.1 Understand the role of the plasma membrane in excitable tissues and changes in ion currents according to membrane potentials.	• Exams. • Oral questions by choosing students to answer

	thereafter more detailed specialist knowledge.		1.2 Analyze potential alterations in transport mechanisms. 1.3 Demonstrate the ability to integrate physiology from the cellular and molecular level to the organ system.	randomly (with no mark).
		2-Understand the contractile mechanisms of skeletal and smooth muscle cells.	2- Analyze possible alterations in the functional structures of the skeletal muscle and impact on skeletal muscle function.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).
		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 ANS.	3.1 Analyze potential changes in the activity of ANS and its receptors and the impact over body systems innervated by ANS. 3.2 Analyze sensory input to the brain and motor output from the brain to the periphery. 3.3 Evaluate the normal functions of different components of the central nervous system and the effect of their disturbances.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).
		4-Understand blood cells and body fluids' composition and functions of all these elements.	4-Analyze alterations of cellular elements of blood and composition of body fluids and plasma proteins and potential functional changes resulting from these alterations.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).

		5-Understand the mechanisms of heart functions including heart muscle and conductive tissue and vessels and their hemodynamics.	5.1 Analyze alterations in cardiac muscle and conductive tissue functions and understand underlying mechanisms for the generation of cardiac diseases. 5.2 Analyze functional changes in vessels and mechanisms that could be involved in generating vascular diseases.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).
		6-Demonstrate Pulmonary mechanics, Pulmonary gas transport and exchange, and regulation of ventilation.	6-Analyze functional changes in the respiratory system and impact the homeostasis of O_2, pH, and CO_2 in the blood.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).
		7-Explain the physiological basis and regulation of gastrointestinal secretion, motility, and absorption.	7- Analyze the digestive mechanism in various organs.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).
	PHARM-LO-3: Articulate how knowledge in foundational sciences is integral to clinical reasoning.	8- Demonstrate hormones, types, secretion, mechanisms of action , major functions, and their regulation.	8.1 Analyze functional changes in the endocrine system and physiologic responses to various hormones. 8.2 Analyze 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). 8.3 Analyze functional changes in the reproductive system	• Exams. • Oral questions by choosing students to answer randomly (with no mark).

			and fertility (in addition to how we can solve fertility issues).	
	PHARM-LO-4: Integrate knowledge from pharmaceutical sciences to explain how specific drugs or drug classes are discovered and developed.	9- The main goal of this course is to provide a presentation of the function of the major organs and organ systems of the human body (the unique role of each organ and organ system in maintaining health).	9.1 describe the functions of each major organ and when appropriate define the role of physiological functional units. 9.2 Develop a vocabulary of terminology to communicate information effectively for topics related to human physiology, and to the followed courses according to the core curriculum including pathophysiology and pharmacology. 9.3 Recognize and explain the principle of homeostasis and how feedback systems control the physiological processes in the human body. 9.4 Understand and explain the physiological connections within and between the systems of the human body. 9.5 Recognize and explain the principle of homeostasis applied to all eleven systems of the human body. 9.6 Use anatomical knowledge to predict physiological responses and use knowledge of physiology to predict the variations of anatomical structures. 9.7 Effectively read and communicate scientific information.	• Exams. • Oral questions by choosing students to answer randomly (with no mark).

			9.8 Synthesize ideas and understand how changes to anatomy and physiology could result in situations of homeostatic imbalance and therefore, developing of diseases “pathophysiology” and how we can use topics covered in physiology course for understanding the development of drugs that happened over time “pharmacology”.	

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 their ability to participate in course activities or meet course requirements. Students with disabilities are

encouraged 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 monitor the 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 by the 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 or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**

- **Misrepresentation of the sources that were used.**

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

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 may refer to the students' handbook.

Others

- At the beginning of the lectures, be on time and don't leave before the end of the lecture without an acceptable excuse.
- If you missed a class, it is your responsibility to find out about any announcements or assignments you have missed.
- For any clarification, please communicate with your instructor at his posted office hours or by appointment.
- 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 instructor and 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 and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account. The criteria for grading are listed at the end of the syllabus

Assessment	Grade Weighting	Deadline Assessment
First exam	17%	~ 6th week
Second exam	18%	~ 10th week
Lab Final Exam	15%	8th week
Reports, quizzes, and evaluation	10%	
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 a combination 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), one lecture period covers 2 lecture hours (120 minutes). The course content specifies chapters of the textbook that will be included in exams.

Introduction	**Introduction to Physiology**	**Week 1**	**1 lecture**
1. Cellular membranes and, cellular organelles. 2. Transport of solutes and water. 3. Determinants of membrane potential. 4. Homeostasis**.**			
Topic 1	**Nerve and Muscle Physiology**	**Week 1, 2**	**3 lectures**
1. Ultrastructure of nerve cells. 2. Generation and conduction of action potential. 3. Ultrastructure of muscle cells. 4. Molecular mechanism of contraction.			
Topic 2	**Autonomic Nervous System**	**Week 3**	**1 lecture**
1. Sympathetic - function, origin, and transmitters. 2. Parasympathetic - function, origin, and transmitters. 3. Adrenal medulla.			
Topic 3	**Central Nervous System**	**Week 3,4**	**3 lectures**
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.			
Topic 4	**Special Senses**	**Week 5**	**2 lectures**
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. 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.			
Topic 5	**Cardiovascular System**	**Week 6,7**	**4 lectures**
1. Ultrastructure of cardiac muscle and, its physiology. 2. conduction system of the heart and, electrocardiography. 3. Heart as a pump and, cardiac 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.			

Topic 6 **Blood and Body Fluids** 1. Extracellular fluid composition. 2. Intracellular fluid composition. 3. Intravascular fluid -blood volume and, composition. 4. Function of formed elements of blood. 5. formation of formed elements of blood and, its regulation. 6. Homeostasis. 7. Plasma proteins.	**Week 8**	**2 lectures**
Topic 7 **Renal System** 1. Nephron ultrastructure. 2. Glomerular function. 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.	**Week 9**	**2 lectures**
Topic 8 **Respiratory System** 1. Ventilation. 2. Mechanics of respiration. 3. Diffusion. 4. Pulmonary circulation. 5. Ventilation -perfusion relationship. 6. Gas transport. 7. Control of respiration.	**Week 10**	**2 lectures**
Topic 9 **Gastrointestinal System** 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.	**Week 11**	**2 lectures**
Topic 10 ***Endocrine System*** 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. 7. Endocrine pancreas and insulin disorders.	**Week 12**	**2 lectures**
Topic 11 ***Reproductive System*** 1. Male gonads hormones and, spermatogenesis. 2. Female gonads hormones, oogenesis, and, menstrual cycle. 3. Fertilization, implantation, and physiology of pregnancy and infertility.	**Week 13**	**2 lectures**
University Final Exams	**Week 14**	