كلية الطب البشري
Faculty of Medicine

The Hashemite University

Course Syllabus

Histology and Molecular Biology

1	Course title	Histology and Molecular Biology
2	Course number	111501105
3	Credit hours (theory)	3
	Contact hours (theory)	3 hours (2 Lectures + 1 (3 Hours) Histology Lab/Week)
4	Course meeting time Course location	Variable
5	Program title	Doctor of Medicine
7	Awarding institution	The Hashemite University
8	Faculty	Faculty of Medicine
9	Department	Basic medical sciences
10	Level of course	First year medical students
11	Year of study and semester (s)	2018/2019 Second semester Course
12	Final Qualification	MD degree
13	Other department (s) involved	None
14	Language of Instruction	English
15	Date of production/revision	01/2019

Course Coordinator:

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Course Description:

Histology is one of the basic medical courses. Histology is the science for researching normal microscopic structures, ultra structures and their related function. Through patterns of class lecture, the students will be made to master the basic knowledge and theory of histology and the human histological structures. Students also should train themselves to use the microscope correctly and cultivate their abilities in analysis, description of histological structures. In addition, the attention should be paid to cultivate the students' abilities to use the syllabus, textbook, laboratory guide and to study by themselves, for elevating the students' foreign language level. This course demands the student to master main English technical terms which are also included in the examination. Through studying this course the students will be given the basis for studying other basic courses and medical clinical course. In the following paragraphs, brief objectives of subjects taught in the syllabus will be listed as follow.

This course also contain an introduction to Biochemistry for Medical students to make them familiar with the major aspects of the cell at the molecular level.

This course consists of topics flow from cell basics to structure and functions of certain macromolecules such as amino acids and proteins. This course also introduce various laboratory techniques especially protein purification techniques. Knowledge of organic chemistry is a prerequisite for this course.

Intended Learning Outcomes (ILOs):

1- To describe the methods of tissue preparation for microscopy examination.
2- To list and understand the different types of light and electron microscopes.
3- To describe different histological techniques used in the study of tissues.
4- To recognize the structure types & function of the four basic types of tissues (epithelium, connective tissue, muscular and nervous tissues).
5- To describe the basic structure and function of the cell.
6- To explore basic molecular aspects of certain cellular components (membrane, cytoskeleton, matrix).

Topic Outline and Schedule:

Histology

Weeks	Specific Objectives

WK 1: Introduction	1) To understand methods of tissue preparation for histological examination 2) To be familiar with the types & applications of light and electron microscopes 3) To know briefly about histological techniques used for tissue & cell study (e.g. Histochemistry)
WK 2: Epithelium 1	1) To describe the general features & characteristics epithelium 2) To understand the basic structure & functions of Basal Lamina or Basement Membrane 3) To understand the structure & function of intercellular junctions (tight, adherent, gap & desmosome)
WK 3: Epithelium 2	1) To describe cell surface specialization (Villi, Stereocilia, Cilia & Flagella) 2) To classify the epithelium into covering & lining, glandular, simple and stratified 3) To be familiar with types, location, functions of covering & lining Epithelia
WK 4: Epithelium 3	1) To understand the structural & functional types of exocrine glands 2) To describe basic histological structure of endocrine glands 3) To understand the different types of epithelial cells (Ion-transporting, pinocytotic, mucous, serous, steroid-secreting, diffuse neuroendocrine)
WK 5: Connective Tissue 1	1) To understand the basic features & characteristics of connective tissue 2) To recognize the different cells of connective tissue, proper (fibroblast, macrophage, plasma, mast) 3) To describe the main types of collagen fibers, and the features of collagen type I
WK 6: Connective Tissue II	1) To describe the structure, features of reticular & elastic fibers 2) To explore the basic structures of ground substance 3) To describe the structure, location and functions of connective tissue proper (loose, dense) 4) To describe connective tissue with special features (elastic tissue, reticular tissue, mucous tissue)
WK 7: Connective Tissue III	1) To describe the types & features of adipose tissue 2) To explore the structure, location & growth of hyaline cartilage 3) To describe the structure & features of elastic fibrocartilage
WK 8: Connective Tissue IV	1) To describe the basic features of bone, bone cells & matrix 2) To describe the structure of periosteum & endosteum 3) To know the histological types of bones 4) To differentiate between primary and secondary bone tissue
WK 9: Connective Tissue V	1) To understand bone histogenesis (intramembranous, endochondral) 2) To describe bones classification, growth & remodeling 3) To understand metabolic role of bone tissue 4) To understand the structure of joints
WK 10:	Midterm Exam

WK 11: **Nerve Tissue & Nervous System 1**	1) To describe the organization of nervous system 2) To describe the structure of nerve tissue (neural cell body, dendrites, axon) 3) To understand the types & functions of glial cells
WK 12: **Nerve Tissue & Nervous System II**	1) To describe the layers & structure of meninges (dura, arachnoid, pia) 2) To describe the structure & function of blood brain barrier 3) To describe the structure & function of choroid plexus & cerebrospinal fluid 4) To describe the components of peripheral nervous system, the structure of myelinated, unmyelinated nerve fibers and nerves
WK 13: **Nerve Tissue & Nervous System III**	1) To describe the structure of sensory & autonomic ganglion 2) To understand autonomic nervous system (sympathetic & parasympathetic) 3) To describe the features degeneration, regeneration of nerve tissue & the role of neural stem cells.
WK 14: Muscle Tissue	1) To describe skeletal muscle tissue; organization, structure & nerve supply 2) To describe the features of cardiac muscle tissue 3) To describe the features of smooth muscle
WK 15:	Revision
WK 16:	Final Exams

Histology Labs

Weeks	**Specific Objectives**
WK 1 & 2	Microscopy
WK 3 & 4	Epithelium 1
WK 5 & 6	Epithelium 2 Connective tissue proper
WK 7 & 8	Connective tissue special features Cartilages
WK 9 & 10	Bone
WK 11 & 12	Muscular tissue
WK 13 & 14	Nervous tissue
WK 15	Revision
WK 16	Exam

Molecular Biology

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Molecular Biology	
Topic	No. Of Lect.
- Introduction	1
- Biochemistry and organization of cells	1
- Water, the solvent for biochemical reactions	2
- Amino acids and peptides:- - structure, function and properties - some small peptides of physiological importance - structural levels of proteins: 1ry,2ry,3ry and quaternary - relation of protein structure and function, muscle contraction	3
- Protein Purification & characterization techniques	2
- Lipids & Membranes:- - Types of lipids & their chemical nature - The nature of biological membrane - Some functions of membranes	2
- Structure of monosaccharides & their reactions	2
- Some important oligosaccharides	
- Structure & functions of polysaccarides	
- Glycoproteins	2

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

1. Textbook & references
2. Lecture notes

Grading Policy:

Grades can be based on the following:

First in-course exam (MCQ): 25 %
Second in-course exam (MCQ): 25 %
Practical Exam: 10%
Final exam at end of the semester (MCQ): 40 %
Total Points 100

Course Policies:

Attendance policies:

If a student is absent for a teaching session then they must discuss this with the course instructor. If a student is absent for more than 25% of the course then he may be liable to fail the course

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

If a student misses an examination then they will have the opportunity for a make-up examination, according to the university regulations.

C- Health and safety procedures:

College Members and students must at all times, conform to Health and Safety rules and procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom. Students violate this policy would be subjected to disciplinary action according to the Hashemite University disciplinary policies

References:

- Harper's Biochemistry. By Robert K. Murray and Co., latest edition.
- Basic Histology, text & atlas; L C Junqueria & J Carneiro, McGraw-Hill Medical Publishing Division. latest edition.
- Biochemistry by Mary Campbell & Shawn Farrell, Thomson Books/Cole ISBN 0-534-39499-X. latest edition.