



كلية الصيدلة جامعة الزيتونة الأردنية  
Faculty of Pharmacy  
Al-Zaytoonah University of Jordan

" نحو تعليم صيدلاني متميز "  
Toward Excellence in Pharmaceutical  
Education

جامعة الزيتونة الأردنية  
Al-Zaytoonah University of Jordan  
كلية الصيدلة  
Faculty of Pharmacy



"Tradition and Quality"

<b>Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department</b>	<b>QF02/0408-3.0E</b>
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Faculty	Pharmacy	Department	Pharmacy
Course number	0120151	Course title	Biology
Number of credit hours	3	Pre-requisite/co-requisite	

### Brief course description

knowledge in Biological Hierarchy and molecular aspects of life, water and its properties and biological macromolecules (structure and function), Cellular organization (structure and function), Cellular Membrane and the traffic in and out of the cell, Cellular divisions and their role in organisms growth and reproduction, Molecular aspects of DNA and its duplication, Gene expression, protein synthesis and Animal tissues.

Course goals and learning outcomes	
<b>Goal 1</b>	Knowledge of the characteristics of life.
Learning outcomes	1.1 Understanding level of organization 1.2 Understanding the diversity of species 1.3 Understanding Taxonomic classification of species
<b>Goal 2</b>	Knowledge of the various types of microscopes, cell structure and their function.
Learning outcomes	2.1 Understanding of the type of microscope and their uses 2.2 Understanding Detailed study of cell structure and function 2.3 Understanding the organelles and their activities for both prokaryotic and eukaryotic cells
<b>Goal 3</b>	Knowledge of the complex structure and function of the plasma membrane and mechanisms.
Learning outcomes	3.1 Understanding of structure and function of the plasma membrane 3.2 Understanding The mechanisms by which substances move in and out of cells 3.3 Understanding Important cell surface modifications and their significance
<b>Goal 4</b>	Knowledge of Animal tissues and the principles of Homeostasis.
Learning outcomes	4.1 Understanding of animal tissues types and function 4.2 Understanding Principles of Homeostasis in animal tissues
<b>Goal 5</b>	Knowledge of The history of the research recognizing and elaborating gene action, processes of transcription, translation and roles in gene expression.
	5.1 Understanding of history of the research recognizing and elaborating gene action 5.2 Understanding the processes of transcription and translation of gene expression 5.3 Understanding the construction and interpretation of a chromosome map 5.4 Understanding the abnormal situations of chromosome number change 5.4 Understanding the types of cell division and the mechanism of cell division.
<b>Textbook</b>	Sylvia Mader, Biology, 11 <sup>th</sup> Edition, McGraw-Hill, Jan 3, 2012
<b>Supplementary</b>	1.- Sylvia S. Mader, Michael Windelspecht, Human Biology, 15th Edition,



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<b>references</b>	<p>McGraw-Hill, Jan 27, 2017</p> <p>2. - Sylvia S. Mader, Connect 2 semester access card for biology, MCgRaw-Hill, Mar 24, 2015.</p> <p>3- Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Jane B. Reece, Campbell Biology, 11<sup>th</sup> Edition, San Francisco, Calif ; London : Pearson Benjamin Cummings, Oct 29, 2016</p> <p>4- Jane B. Reece, Martha R. Taylor, Eric J. Simon, Jean L. Dickey, Campbell Biology: Concepts &amp; Connections, 8<sup>th</sup> Edition, San Francisco, Calif ; London : Pearson Benjamin Cummings, Jan 6,2014.</p>
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**Course timeline**

Week	Number of hours	Course topics	Pages (textbook)	Notes
2-1	1	<b>Introduction</b>	44-50	
	1	<b>Water and Life</b>		
	1	<ul style="list-style-type: none"> <li>) The polarity covalent bonds in water molecules result in hydrogen bonding</li> <li>) Four emergent properties of water contribute to Earth's suitability for life</li> </ul>		
2	1	<b>Carbon and the Molecular Diversity of Life</b>	56	
	1	Carbon: The backbone of Life	62-64	
	1	<ul style="list-style-type: none"> <li>) A few chemical groups are key to molecular function</li> <li>) The Chemical Groups Most Important in the Processes of Life</li> <li>) ATP: An Important Source of Energy for Cellular Processes</li> </ul>		
4-2	1	<b>The Structure and Function of Large Biological Molecules</b>	66-87	
	1	<ul style="list-style-type: none"> <li>) Macromolecules are polymers, built from monomers</li> <li>) Carbohydrates serve as fuel and building material</li> </ul>		
	1	<ul style="list-style-type: none"> <li>) Lipids are a diverse group of hydrophobic molecules</li> <li>) Proteins include a diversity of structures, resulting in a wide range of functions</li> <li>) Nucleic acids store, transmit, and help express hereditary information</li> </ul>		
6-4	1	<b>A Tour of the Cell</b>	93-122	
	1	6.1. Biologists use microscopes and the tools of biochemistry to study cells ( <i>Figure 6.3 is not included</i> ).		
	1	6.2. Eukaryotic cells have internal membranes that		



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		<p>compartmentalize their functions</p> <p>6.3. The eukaryotic cell's genetic instructions are housed in the nucleus and carried out by the ribosomes.</p> <p>6.4. The endomembrane system regulates protein traffic and performs metabolic Functions in the cell</p> <p>6.5. Mitochondria and chloroplasts change energy from one form to another</p> <p>6.6. The cytoskeleton is a network of fibers that organizes structures and activities in the cell</p> <p>6.7. Extracellular components and connections between cells help coordinate cellular activities.</p>		
8-7	1 1 1	<p><b>Membrane Structure and Function</b></p> <p>7.1. Cellular membranes are fluid mosaics of lipids and proteins. (Membrane models are not included).</p> <p>7.2. Membrane structure results in selective permeability</p> <p>7.3. Passive transport is diffusion of a substance across a membrane with no energy investment</p> <p>7.4. Active transport uses energy to move solutes against their gradients</p> <p>7.5. Bulk transport across the plasma membrane occurs by exocytosis and endocytosis</p>	124-138	
8	1 1 1	<p><b>Basic Principles of Animal Form and Function</b></p> <p>Hierarchical Organization of Body Plans</p> <p><i>Figure 40.5: Structure and Function in Animal Tissues</i></p> <p>40.2 Feedback control maintains the internal environment in many animals</p>	870-877	
10-9	1 1 1	<p><b>The Cell Cycle</b></p> <p>12.1. Most cell division results in genetically identical daughter cells.</p> <p>12.2. The mitotic phase alternates with interphase in the cell cycle. (The evolution of mitosis is not included)</p> <p>12.3 The eukaryotic cell cycle is regulated by a molecular control system (<b>In brief</b>) (<i>The Cell Cycle Clock and The Loss of Cell Cycle Controls in Cancer Cells are not included</i>).</p>	232-243	
11-10	1 1 1	<p><b>Meiosis and Sexual Life cycles</b></p> <p>13.1 Offspring acquire genes from parents by inheriting chromosomes.</p> <p>13.2. Fertilization and meiosis alternate in sexual life cycles.</p>	252-262	



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		(The variety of sexual life cycles is not included). 13.3. Meiosis reduces the number of chromosome sets from diploid to haploid.		
<b>12-11</b>	<b>1 1 1</b>	<b>The Molecular Basis of Inheritance</b> 16.1. DNA is the genetic material 16.2. Many proteins work together in DNA replication and repair ( <i>Evolutionary significance of altered DNA nucleotides are not included</i> ). 16.3 A chromosome consists of a DNA molecule packed together with proteins  15.4 Alterations of chromosome number or structure cause some genetic disorders	<b>312-330</b>          <b>306-307</b>	
<b>14-12</b>	<b>1 1 1</b>	<b>Gene Expression: From Gene to Protein</b>  17.1. Genes specify proteins via transcription and translation 17.2. Transcription is the DNA-directed synthesis of RNA: a closer look 17.3. Eukaryotic cells modify RNA after transcription (The functional and evolutionary importance of introns is not included) 17.4. Translation is the RNA-directed synthesis of a polypeptide: a closer look 17.5. Mutations of one or a few nucleotides can affect protein structure and function	<b>333-348</b>          <b>350-354</b>	
		Final Examination		

<b>Theoretical course evaluation methods and weight</b>	First exam 25% Second exam 25% Final exam 50%	<b>Practical (clinical) course evaluation methods</b>	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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<b>Approved by head of department</b>		<b>Date of approval</b>	
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Extra information (to be updated every semester by corresponding faculty member)

<b>Name of teacher</b>	Ameen Al-Assi	<b>Office Number</b>	<b>219</b>
<b>Phone number (extension)</b>	313	<b>Email</b>	<a href="mailto:ameen.lassi@zug.edu.jo">ameen.lassi@zug.edu.jo</a>
<b>Office hours</b>	10 – 11 all the weak		