University Of Jordan
Faculty Of Science

Department of Biological Sciences

GENERAL BIOLOGY I (304101) Syllabus
3 Credit Hours
First Semester 2019/2020

Lect. No.	Chap. No.	Topic	Pages
1	---	***Introduction***	
2-3	3	***The Chemistry of Water***	92-98
		3.1. Polar covalent bonds in water molecules result in hydrogen bonding	
		3.2. Four emergent properties of water contribute to Earth's suitability for life	
		- **Assignment**: Acidification: A threat to our oceans	101
4-8	5	***Biological Macromolecules and Lipids***	114-134
		5.1. Macromolecules are polymers, built from monomers	
		5.2. Carbohydrates serve as fuel and building material	
		5.3. Lipids are a diverse group of hydrophobic molecules	
		5.4. Proteins include a diversity of structures, resulting in a wide range of functions	
		5.5. Nucleic acids store, transmit, and help express hereditary information	
9-14	7	***Cell Structure and Function***	163-191
		7.1. Biologists use microscopes and the tools of biochemistry to study cells	
		Assignment: *Microscopes (focus on types and function) and cell fractionation.*	
		7.2. Eukaryotic cells have internal membranes that compartmentalize their functions	
		7.3. The eukaryotic cell's genetic instructions are housed in the nucleus and carried out by the ribosomes.	
		7.4. The endomembrane system regulates protein traffic and performs metabolic functions	
		7.5. Mitochondria and chloroplasts change energy from one form to another	
		7.6. The cytoskeleton is a network of fibers that organizes structures and activities in the cell ***(In brief)***	
		7.7. Extracellular components and connections between cells help coordinate cellular activities	
15-17	8	***Cell Membranes***	196-211
		8.1. Cellular membranes are fluid mosaics of lipids and proteins.	
		8.2. Membrane structure results in selective permeability	
		8.3. Passive transport is diffusion of a substance across a membrane with no energy investment	
		8.4. Active transport uses energy to move solutes against their gradients	
		8.5. Bulk transport across the plasma membrane occurs by exocytosis and endocytosis	
18-20	6	***Energy and Life***	141
		6.2. The free-energy change of a reaction tells us whether or not the reaction occurs spontaneously	145-159
		6.3. ATP powers cellular work by coupling exergonic reactions to endergonic reactions	
		6.4. Enzymes speed up metabolic reactions by lowering energy barriers	
		6.5. Regulation of enzyme activity helps control metabolism	
21-25	10	***Cell Respiration***	236-256
		10.1. Catabolic pathways yield energy by oxidizing organic fuels	
		10.2. Glycolysis harvests chemical energy by oxidizing glucose to pyruvate	
		10.3. After pyruvate is oxidized, the citric acid cycle completes the energy-yielding oxidation of organic molecules	
		10.4. During oxidative phosphorylation, chemiosmosis couples electron transport to ATP synthesis	
		10.5. Fermentation and anaerobic respiration enable cells to produce ATP without the use of oxygen	
		10.6. Glycolysis and the citric acid cycle connect to many other metabolic pathways	

Lect. No.	Chap. No.	Topic	Pages
26-28	11	***Photosynthetic Processes*** *11.1. Photosynthesis converts light energy to the chemical energy of food* *11.2. The light reactions convert solar energy to the chemical energy of ATP and NADPH* *11.3. The Calvin cycle uses the chemical energy of ATP and NADPH to reduce CO_2 to sugar*	**259-274**
29	12	***Mitosis*** *12.1. Most cell division results in genetically identical daughter cells.* *12.2. The mitotic phase alternates with interphase in the cell cycle.* *(The evolution of mitosis is not included)*	**284-293**
30-31	13	***Sexual Life cycles and Meiosis*** *13.1 Offspring acquire genes from parents by inheriting chromosomes.* *13.2. Fertilization and meiosis alternate in sexual life cycles.* *(The variety of sexual life cycles is not included)* *13.3. Meiosis reduces the number of chromosome sets from diploid to haploid.*	**304-314**
32-34	16 " "	***Nucleic Acids and Inheritance*** *16.1. DNA is the genetic material* *16.2. Many proteins work together in DNA replication and repair* *(Evolutionary significance of altered DNA nucleotides and replicating the ends of DNA molecules are not included).* *16.3 A chromosome consists of a DNA molecule packed together with proteins*	**364-382**
35-39	17	***Expression of Genes*** *17.1. Genes specify proteins via transcription and translation* -**Assignment**: Nutritional mutations in Neurospora: Scientific Inquiry *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*	**385-410**
40-42	26	***Introduction to Viruses*** *26.1. A virus consists of a nucleic acid surrounded by a protein coat* *(Table 19.1 is not included)* *26.2. Viruses replicate only in host cells* *(Evolution of viruses is not included)*	**608-617**

COURSE TEXT BOOK: **Campbell Biology 11th Ed. (2017). Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V. & Reece, J. B. Publisher: Pearson.**

Course Information website: www.bio101a.blogspot.com

Grading System **The grade is distributed over online multiple-choice exams as follows:**

Description	*Weight*
First exam	*30%*
Midterm exam	*30 %*
Final exam	*40 %*

ATTENDANCE POLICY

Absence from lectures should not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course.

HOW TO BE SUCCESSFUL IN THIS CLASS

1. Attend the classes. 2. Read your text before you come to lecture. 3. Take good, concise class notes. 4. Learn your vocabularies. 5. Use the textbook and highlight your text. 6. Review and rewrite your class notes within 24 hours of class. 7. Schedule your studying time and stick to it. You should spend at least 2 hours outside class for every hour you are in class. 8. If you are absent, it is your responsibility to get the notes and handouts from a classmate because you will still be held accountable for the material covered in class. 9. Always check the syllabus. It contains chapters, sections and assignments with their corresponding pages. These are the materials that you will be asked about in the class and you will be examined in.