



Al-Balqa Applied University
Faculty of Science
Department of Medical Laboratory Sciences
Course Syllabus
(General Biology 101)
Second Semester 2015/2016

Course Information	
Course Title	General Biology 101
Course Code	30203101
Prerequisites	-
Instructor	
Course Objectives	
<p>The course provides necessary basic information about biology for various topics to enable the students to understand the science of life or living matter. By the end of this course the student is expected to :</p> <ul style="list-style-type: none"> ▪ Know the basic structure and chemistry of cell ▪ Understand different biological topics such as cellular respiration, photosynthesis, cell communication, cell division..... 	

Textbook	
Title	Biology
Author (s)	Campbell, N.A., Reece, J.B.
Publisher	Benjamin Cummings Publishing Co.
Year	2008 (8 th edition)
Other references	-

Assessment		
Assessment	Expected Due Date	Percentage
First Exam	As assigned by course instructor	25%
Second Exam	As assigned by course instructor	25%
Final Exam	Assigned by university registration	50%

Teaching & Learning Methods
Direct Teaching (Lectures & Discussions). - Critical and creative thinking

Course content (Lectures)			
Lecture No.	Chapter No.	Topics	Pages
1-2	3	<p>Introduction</p> <p>Water and the fitness of the environment</p> <p>3.1: The polarity of water molecules results in hydrogen bonding</p> <p>3.2: Four emergent properties of water contribute to Earth's fitness for life</p>	<p>46-51</p> <p>46-47</p> <p>47-51</p>
3	4	<p>Carbon and the molecular basis of diversity</p> <p>A small number of chemical groups are key to the functioning of biological molecules (Figure 4.10)</p>	63-65
4-8	5	<p>The Structure and Function of Large Biological Molecules</p> <p>5.1. Macromolecules are polymers, built from monomers</p> <p>5.2: Carbohydrates serve as fuel and building material</p> <p>5.3: Lipids are a diverse group of hydrophobic molecules</p> <p>5.4: Proteins have many structures, resulting in a wide range of functions</p> <p>5.5: Nucleic acids store and transmit hereditary information</p>	68-88
9-13	6	<p>A Tour of the Cell</p> <p>6.1: To study cells, biologists use microscopes and the tools of biochemistry</p> <p>6.2: Eukaryotic cells have internal membranes that 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</p>	94-122

		<p>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 (in brief)</p> <p>6.7: Extracellular components and connections between cells help coordinate cellular activities</p>	
14-16	7	<p>Membrane structure and function</p> <p>7.1 cellular membrane are fluid mosaics of lipids and proteins</p> <p>7.2. Membrane structures 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>	125-139
17-20	8	<p>An introduction to metabolites</p> <p>8.2 The free energy change of a reaction tells whether or not a reaction occurs spontaneously.</p> <p>8.3 ATP powers cellular work by coupling exergonic reactions to endergonic reactions</p> <p>8.4 enzymes speed up metabolic reaction by lowering energy barriers</p> <p>8.5. Regulation of enzyme activity helps control metabolism</p>	142-159
20-22	9	<p>Cellular respiration : harvesting chemical energy</p> <p>9.1 Catabolic pathways yield energy by oxidizing glucose to pyruvate</p> <p>9.3 The citric acid cycle completes the energy- yielding oxidation of organic molecules</p>	162-182

		<p>9.4 During oxidation phosphorylation, chemiosmosis couples electron transport to ATP synthesis</p> <p>9.5 Fermentation enables some cells to produce ATP without the use of oxygen</p> <p>9.6 Glycolysis and citric acid cycle connect to many other metabolic pathways</p>	
23-25	10	<p>Photosynthesis</p> <p>10.1: Photosynthesis converts light energy to the chemical energy of food</p> <p>10.2: The light reactions convert solar energy to the chemical energy of ATP and NADPH</p> <p>10.3: The Calvin cycle uses ATP and NADPH to convert CO₂ to sugar</p>	185-199
26-29	12	<p>The Cell Cycle</p> <p>12.1: Cell division results in genetically identical daughter cells</p> <p>12.2: The mitotic phase alternates with interphase in the cell cycle</p>	228-238
30-31	13	<p>Meiosis and Sexual Life Cycles</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> <p>13.3: Meiosis reduces the number of chromosome sets from diploid to haploid</p> <p>13.4: Genetic variation produced in sexual life cycles</p>	248-260
32-34	16	<p>The Molecular Basis of Inheritance</p> <p>16.1: DNA is the genetic material</p> <p>16.2: Many proteins work together in DNA replication and repair</p>	305-323

35-38	17	<p>From Gene to Protein</p> <p>17.1: Genes specify proteins via transcription and translation</p> <p>17.2: Transcription is the DNA-directed synthesis of RNA: <i>a closer look</i></p> <p>17.3: Eukaryotic cells modify RNA after transcription</p> <p>17.4: Translation is the RNA-directed synthesis of a polypeptide: <i>a closer look</i> <i>Concept 17.5: Point mutations can affect protein structure and function</i></p> <p>17.6: Comparing gene expression in prokaryotes and eukaryotes reveals key differences</p>	325-348
39-41	18	<p>Plant Structure, Growth, and Development</p> <p>35.1: The plant body has a hierarchy of organs, tissues, and cells</p> <p>35.2: Meristems generate cells for new organs</p> <p>35.3: Primary growth lengthens roots and shoots</p> <p>35.4: Secondary growth adds girth to stems and roots in woody plants</p> <p>35.5: Growth, morphogenesis, and differentiation produce the plant body</p>	

Additional Notes

**** Attendance policy:** Excuses for absence must be first discussed with the instructor, and approved by the deanship.

**** Expected workload:** The student is expected to attend all the classes, attend and pass the exams.