

# Al al-Bayt University

## Faculty of Science

### Department of Biological Sciences

Title & Instructor	
Course Title	Practical General Biology
Course Number	404103
Instructor	DR. Abdulrahim Aljamal
Office Location	Biological Sciences
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Text book	<ol style="list-style-type: none"><li>1- Manual of General Biology.</li><li>2- Biology, 11<sup>th</sup> Edition 2018 by Campell NA, Urry LA, Cain ML, Wasserman SA, Minorsky PV and Reece JB</li></ol>

Course Description
General Biology (404103) reinforces the understanding of cellular, molecular and genetic processes learned in General Biology lectures. Exercises include the use of microscope in examination of cells and tissues, biochemical analysis of enzyme activity, osmosis, cellular respiration, genetic investigation as well as examining plant and animal tissues and human systems.

**Student Learning Outcomes(SLOs)  
(4-8 Maximum)**

Upon successful completion of this course, students should be able to:

SLOs	Related ILO(s)* (numbers only)	Evaluation Criteria (MCQ, OSCE, Homework...)	
		Type of Criteria (MCQ, OSCE, Homework...)	Weight (%)
1. Use instruments such as microscopes to study cell structure and function and various laboratory techniques to study molecules of living things such as enzymes, carbohydrates, lipids and nucleic acids.	1 , 2	MCQ	30
2. Explain the basic concepts in biology, including the chemical basis of life, structure of cells and how they produce and use energy, how they reproduce, and how inheritance works.	1 , 2	MCQ	25
3. Understand plant tissue structure and function.	2	MCQ	15
4. Understand animal structure and function with comparison to human body and emphasis on major physiological systems such as digestive, respiratory, circulatory, and reproductive and nervous systems.	1 , 2	MCQ	30
			<b>100</b>

\* From the list of Program Student Outcomes (see the end of this sheet)

## Course Contents

Week	Title of Activity	Type of Activity (Lecture, Lab, Round rotation, etc...)	Outline
<b>1</b>	Lab Safety, Scientific Writing, and Microscopy	Laboratory	1- To eliminate or reduce the risk that laboratory work poses to worker, student exposed to the hazards laboratory work. 2- To be able to write scientific reports including analysis of data and graphing. 3- To obtain basic microscopy skills and concepts such as magnification, working distance, resolution, etc. .... 4- To be able to differentiate between different types of microscopes
<b>2</b>	Cell Structure and Function	Laboratory	1- To understand the basic structures of the prokaryotic and eukaryotic cell and their functions. 2- To differentiate between prokaryotic and eukaryotic cells, plant and animal cells, unicellular and multicellular organisms.
<b>3</b>	Macromolecules and Living Things	Laboratory	1- To understand the cellular functions of carbohydrate, protein, lipids and vitamins. 2- To be able to reveal the presence of different type of macromolecule in solutions such as carbohydrate, protein, lipids and vitamins.
<b>4</b>	Enzyme Activity	Laboratory	1- To study the effect of different factors on enzyme activity such as pH, temperature, enzyme and substrate concentration. 2- To reveal the presence of enzymes in different type of vegetables and fruits.
<b>5</b>	Cellular Respiration and Fermentation	Laboratory	1- To be able to describe energy flow at the cellular level. 2- To differentiate between aerobic and anaerobic respiration as well as fermentation. 3- To study the end products of aerobic respiration, anaerobic respiration, and fermentation.
<b>6</b>	Diffusion and Osmosis	Laboratory	1- To connect the concepts of diffusion and osmosis to the cell structure and function 2- To study the effect of osmotic pressure on different types of cell. 3- To design experiments to study the factor that affect the diffusion of gases and dialysis. 4- To define selective permeability of cell membrane, simple diffusion, facilitated diffusion, osmosis, active transport,

			passive transport, exocytosis, endocytosis, phagocytosis, pinocytosis, hypertonic, isotonic, and hypotonic solutions.
<b>7</b>	Human Genetics	Laboratory	<ol style="list-style-type: none"> <li>1- To be able to describe the mechanisms of inheritance at both the cellular and organismal level.</li> <li>2- To understand the cellular functions of DNA and RNA.</li> <li>3-To Define the gene and genotype and differentiate genotype from phenotype.</li> </ol>
<b>8</b>	Mitosis and Meiosis	Laboratory	<ol style="list-style-type: none"> <li>1-Describe the chromosome structure and packaging.</li> <li>2- To study the events that takes place on different stages of mitosis and meiosis.</li> <li>3- To study the differences between mitosis and meiosis.</li> <li>4- To study the events that occurs on different stages of cell cycle.</li> <li>5-To describe the process of DNA replication and mitosis and explain the importance of mitotic cell division.</li> </ol>
<b>9</b>	Plant Tissues and Organs	Laboratory	<ol style="list-style-type: none"> <li>1-To differentiate between different plant tissues and the distribution of these tissue in plant cell.</li> <li>2- To differentiate between monocot and dicot plant by studying cross and longitudinal sections of plant organs.</li> <li>3- To study the structures of vegetative and reproductive organs of plant.</li> </ol>
<b>10</b>	Animal Tissues	Laboratory	<ol style="list-style-type: none"> <li>1- To identify the four major tissue types and their chief subcategories and explain their structural and functional differences.</li> <li>2-To identify the primary locations of the various tissue types in the body.</li> </ol>
<b>11</b>	Histology of Human organs	Laboratory	<ol style="list-style-type: none"> <li>1- To identify the four major tissue types and their chief subcategories and explain their structural and functional differences in each organ.</li> <li>2-To identify the specific locations and arrangement of the various tissue types in different organs.</li> <li>3- To study the structure and function of different human organs.</li> </ol>
<b>12</b>	Human Systems	Laboratory	<ol style="list-style-type: none"> <li>1- To Identify features of the human body.</li> <li>2- To study the structure and function of human systems</li> </ol>

<b>Assessment</b>		
<b>Assessment Type</b>	<b>Expected Due Date</b>	<b>Weight</b>
<b>Quizzes</b>		--
<b>Midterm Exam</b>		--
<b>Evaluation</b>		--
<b>Research activity</b>		--
<b>Final Exam (Theory)</b>		--
<b>Final Exam(Oral)</b>		--
<b>Total</b>		<b>100</b>

**List of Intended Learning Outcomes:**

- 1) Demonstrate a sufficient understanding of the structural organization and functions of the following systems of the human body: circulatory, respiratory, gastrointestinal, endocrine, hematopoietic & lymphatic, musculoskeletal, nervous, and genitourinary systems.
- 2) Conceptualize the cellular, molecular, genetic, and biochemical mechanisms that maintain body's homeostasis and their derangements in disease states.
- 3) Apply their knowledge of human anatomy and function to solve questions regarding major clinical cases and diseases.
- 4) Attain appropriate and systematic clinical history of different medical conditions and settings.
- 5) Demonstrate proficiency in performing clinical skills and procedures.
- 6) Perform relevant physical examination on patients professionally and ethically.
- 7) Identify the major signs and symptoms of disease states, recognizing risk factors and etiologies, in an interdisciplinary approach to differentially diagnose patients.
- 8) Order and interpret results of relevant basic diagnostic procedures, such as laboratory investigations and conventional imaging procedures.
- 9) Apply safe and accurate methods of pharmacotherapy of major disease states.
- 10) Critically appraise research studies guided by evidence-based medicine.
- 11) Demonstrate ability to work in diverse settings and communities.