Zarqa University
Faculty of science
Department: Service courses unit

First Semester 2019-2020

Course title: General biology 101

Course description:

This course introduces the principles and concepts of biology. Emphasis is on basic biological chemistry, cell structure and function, metabolism and energy transformation, genetics, evolution, classification, and other related topics. Upon completion, students should be able to demonstrate understanding of life at the molecular and cellular levels.

Aims of the course:

1. List the fundamental features of prokaryotic and eukaryotic cells and methods used to examine them.
2. Describe the structure, composition and role of eukaryotic cell membranes.
3. Recognize and give roles for the major cell organelles.
4. Identify and give roles for components of the extracellular matrix.
5. Recall types of cell-cell junctions.
6. Name specific processes and proteins involved in membrane transport.
7. State the major stages of the cell cycle.
8. Relate various parameters important in the control of membrane potential.

Intended Learning Outcomes: (ILOs)

A. Knowledge and Understanding

A1.ConceptsandTheories:

I. Recognize the forms and functions of different levels of biological organization, ranging from molecules, cells, tissues, organs, to organisms and populations in microbes, plants and animals.

II. Students should be able to demonstrate knowledge and understanding in relation to: 1. Biological phenomena, facts, laws, definitions, concepts, theories 2. Biological vocabulary, terminology, conventions (including symbols, quantities and units) 3. Scientific instruments and apparatus used in biology, including techniques of operation and aspects of safety 4. Scientific quantities and their determination 5. Biological and technological applications with their social, economic and environmental implications.

A2.Contemporary Trends, Problems and Research: Provide a broad introduction to biological science. Research, using a wide ranges of sources, including print materials, the Internet and digital technologies.

A3.Professional Responsibility: Encourage public discussion of biological issues.

B. Subject-specific skills

B1. Problem solving skills: Connecting students with different sources of information and encourage students to solve many tasks during each chapter.

B2.Modeling and Design: Using animation, video and film resources to capture/obtain information not available in other forms.

B3.Application of Methods and Tools: Laboratory exercises reinforce lecture topics and include microscope techniques.

C. Critical-Thinking Skills

C1.Analytic skills: Develop a research project or presentation, collect and analyze data and/or develop theoretical models.

C2.Strategic Thinking: Extracting and reorganizing information in the form of flow charts, tables, graphs, diagrams, prose and keys.

C3.Creative thinking and innovation: Improve logical thinking, precision, open-mindedness, and objectivity.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.Communication: Effectively communicate clearly and accurately about biological issues in both oral and written form.

D2.Teamwork and Leadership: Fostering an ability to collaborate effectively with others on scientific projects, leading to a productive outcome.

Course structures:

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1	3		**Water and the Fitness of the Environment** -Polarity of water molecules and its effects -Water is the solvent of life -Dissociation of water molecules and pH changes	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion
2 , 3, 4	3		**The Structure and Function of Macromolecules** -Polymers principles -Carbohydrates-fuel and building material -Lipids-triglycerides, phospholipids, and steroids -Protein-the molecular tools of the cell -Nucleic acid-informational polymers	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion
5, 6, 7	3		**A Tour of the Cell** -The Nucleus and Ribosome, ER, Golgi apparatus, Lysosomes, Vacuoles, Mitochondria , Chloroplast and Peroxisomes -The Cytoskeleton, Cell surface and junctions	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion
8, 9	3		**Membrane Structure and Function** -Membrane models evolution-fluid mosaic model -Traffic across membrane-membrane proteins -Exocytosis and endocytosis	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion
10, 11	3		**Cellular Respiration** -Catabolic pathways -Glycolysis, Krebs cycle and electron transport -ATP synthesis -Elated metabolic process-fermentation -Feedback mechanisms control	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion

			cellular respiration		
12,13	3		**The Cell Cycle** -The mitotic cell cycle-phases of the process - Regulation of the cell cycle **Meiosis and Sexual Life Cycle** -An introduction to heredity -The role of meiosis in sexual life cycles -Origins of genetic variation	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion
14	3		**Form Gene to Protein** -The connection between gene and proteins -Genes specify proteins -Transcription and translation -The genetic code nucleotide triplets specify amino acids -The synthesis and processing of DNA -The synthesis of proteins	Lecture, oral inquiry, model and chart	Class participation, homework, and discussion

References:

A. Main Textbook: Campbell Biology: Concepts & Connections (10th Edition)

Assessment Methods:

Methods	Grade	Date
First Exam	25%	17-28/11/2019
Second Exam	25 %	22/12/2019 - 2/1/2020
Final Exam	50 %	Determined by Registration office