

Course E-Syllabus

1	Course title	General Biology I
2	Course number	0304101
3	Credit hours	3
	Contact hours (theory, practical)	(3,0)
4	Prerequisites/corequisites	-
5	Program title	B.Sc. Biological Sciences
6	Program code	04
7	Awarding institution	The University of Jordan
8	School	Science
9	Department	Biological Sciences
10	Level of course	1 st year
11	Year of study and semester (s)	2019/2020 Summer
12	Final Qualification	School Requirement
13	Other department (s) involved in teaching the course	N/A
14	Language of Instruction	English
15	Teaching methodology	<input type="checkbox"/> Blended <input type="checkbox"/> Online
16	Electronic platform(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....
17	Date of production/revision	10 Oct. 2020

18 Course Coordinator:

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20 Course Description:

As stated in the approved study plan.

General biology I covers the internal structure of the cell, molecules of the cell, traffic across biological membranes, metabolism, respiration and photosynthesis, cell-cell signaling, cell division, molecular biology of the gene, DNA technology, chemical signals in plants and animals.

21 Course aims and outcomes:

A- Aims:

This course has two major aims: i) to provide an introduction to biological molecules and cell structure and functions and ii) to give a closer look to major functions in biology such as energy transformation, transport across membranes, protein synthesis, cell division, and inheritance.

B- Intended Learning Outcomes (ILOs):

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

1. Recognize the components of biological molecules.
2. Understand cell structure, and function and describe the generalized structure of prokaryotic and eukaryotic cells.
3. Describe how substances cross biological membranes
4. Understand the importance of energy flow as in respiration and photosynthesis.
5. Describe mitosis and meiosis, as well as the cell cycle, and explain the importance of each process in reproduction and growth.
6. Describe the structure and function of DNA and RNA.
7. Practice the application of biological information in life
8. Recognize and use scientific language, including vocabulary and images, particularly in the context of understanding science daily life and popular culture.

22. Topic Outline and Schedule:

Week	Lecture	Topic	Teaching Methods*/ platform*	Evaluation Methods**	References
1	1	Introduction Adapting to live meeting platform	*	**	-
	2	The Chemistry of Water 3.1. The polar covalent bonds in water molecules result in hydrogen bonding	*	**	Chapter 3 pp 92-98
	3	3.2. Four emergent properties of water contribute to Earth's suitability for life <i>Assignment: Acidification: A threat to water quality</i>	*	**	Chapter 3 P 101
2	1	Biological Macromolecules and Lipids 5.1. Macromolecules are polymers, built from monomers	*	**	Chapter 5 P 114 - 134
	2	5.2. Carbohydrates serve as fuel and building material	*	**	-
	3	5.3. Lipids are a diverse group of hydrophobic molecules	*	**	-
3	1	5.4. Proteins include a diversity of structures, resulting in a wide range of functions	*	**	-
	2	5.5. Nucleic acids store, transmit, and help express hereditary information	*	**	-
	3	5.4. Proteins include a diversity of structures, resulting in a wide range of functions	*	**	-

4	1	<p>Cell Structure and Function</p> <p>7.1. Biologists use microscopes and the tools of biochemistry to study cells <i>Assignment: Microscopes (focus on types and function) and cell fractionation.</i></p> <p>7.2. Eukaryotic cells have internal membranes that compartmentalize their functions</p>	*	**	Chapter 7 P 163-191
	2	7.3. The eukaryotic cell's genetic instructions are housed in the nucleus and carried out by the ribosomes.	*	**	-
	3	7.4. The endomembrane system regulates protein traffic and performs metabolic functions in the cell	*	**	-
5	1	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)	*	**	-
	2	7.7. Extracellular components and connections between cells help coordinate cellular activities	*	**	-
	3	First Exam	*	**	
6	1	<p>Cell Membranes</p> <p>8.1. Cellular membranes are fluid mosaics of lipids and proteins. <i>* (Membrane models are not included).</i></p> <p>8.2. Membrane structure results in selective permeability</p>	*	**	Chapter 8 P 196-211
	2	8.3. Passive transport is diffusion of a substance across a membrane with no energy investment	*	**	-
	3	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	*	**	-
7	1	<p>Energy and Life</p> <p>6.2. The free-energy change of a reaction tells us whether or not the reaction occurs spontaneously</p> <p>6.3. ATP powers cellular work by coupling exergonic reactions to endergonic reactions</p>	*	**	Chapter 6 P 141 pp 145-159
	2	6.4. Enzymes speed up metabolic reactions by lowering energy barriers 6.5. Regulation of enzyme activity helps control metabolism	*	**	-
	3	<p>Cell Respiration</p> <p>10.1. Catabolic pathways yield energy by oxidizing organic fuels</p> <p>10.2. Glycolysis harvests chemical energy by oxidizing glucose to pyruvate</p>	*	**	Chapter 10 P 236-256
8	1	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	*	**	-
	2	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	*	**	-

	3	Midterm Exam	*	**	
9	1	Photosynthetic Processes 11.1. Photosynthesis converts light energy to the chemical energy of food	*	**	Chapter 11 P 259-274
	2	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	*	**	-
	3	Nucleic Acids and Inheritance 16.1. DNA is the genetic material	*	**	Chapter 16 P 364-382
10	1	16.2. Many proteins work together in DNA replication and repair <i>(Evolutionary significance of altered DNA nucleotides and replicating the ends of DNA molecules are not included).</i>	*	**	-
	2	16.3 A chromosome consists of a DNA molecule packed together with proteins	*	**	-
	3	Expression of Genes 17.1. Genes specify proteins via transcription and translation <i>Assignment: Nutritional mutations in Neurospora: Scientific Inquiry</i>	*	**	Chapter 17 P 385-410
11	1	17.2. Transcription is the DNA-directed synthesis of RNA: a closer look	*	**	-
	2	17.3. Eukaryotic cells modify RNA after transcription <i>(The functional and evolutionary importance of introns is not included)</i>	*	**	-
	3	17.4. Translation is the RNA-directed synthesis of a polypeptide: a closer look	*	**	-
12	1	17.5. Mutations of one or a few nucleotides can affect protein structure and function	*	**	
	2	Introduction to Viruses 26.1. A virus consists of a nucleic acid surrounded by a protein coat <i>(Table 26.1 is not included)</i> 26.2. Viruses replicate only in host cells <i>(Evolution of viruses is not included)</i>	*	**	Chapter 26 P 608-617
	3	Review	*	**	

* Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting

* Platform is Microsoft Teams; unless otherwise indicated by your instructor

** Evaluation methods include: First exam, Midterm exam, and Final exam

23 Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
First Exam	20	Chapters 3, 5, and 7	TBD	On campus
Midterm Exam	30	Chapters 8, 6, and 10	TBD	On campus
Final Exam	50	All material	TBD	On campus

24 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

Students are **required** to have access to the following:

- A computer (with webcam & microphone)
- Active and dependable internet connection
- E-Learning website (not the mobile application) works smoothly on their computer.
- Make sure to install the application (platform) which will be used by your instructor to conduct the live meetings (Microsoft Teams).

25 Course Policies:

A- Attendance policies:

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.

B- Absences from exams and submitting assignments on time:

You should contact **your instructor** as soon as possible if you miss an exam. All such cases will be dealt with according to the rules outlined in your student handbook.

C- Health and safety procedures:

N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All violations pertaining to cheating, plagiarism, misbehavior will be dealt with in accordance to the rules outlined in your student handbook.

E- Grading policy:

All exams are made up of MCQ' and will be graded automatically.

F- Available university services that support achievement in the course:

- Microsoft Teams → live meeting → <https://teams.microsoft.com>
- University of Jordan's E-Learning online educational portal → <http://www.elearning.ju.edu.jo>
- Mobile application to access E-Learning platform (Moodle)

26 References:

A- Required book(s), assigned reading and audio-visuals:

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

B- Recommended books, materials and media:

If you purchase a new copy of the textbook, you can enroll in the (Biology: A Global Approach, Global Edition, 11e) website. At <http://www.masteringbiology.com>

27 Additional information:

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Head of Curriculum Committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of Curriculum Committee/Faculty: ----- Signature: -----

Dean: ----- Signature: -----