

Course 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	Course level	1 st year	
11	Year of study and semester (s)	2022/2023 First Semester	
12	Other department (s) involved in teaching the course	N/A	
13	Main teaching language	English	
14	Delivery method	<input type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
016	Issuing/Revision Date	Oct.9.2022	

17 Course Coordinator:

Name: Dr. Khaldoun Al-Hadid	Contact hours: Sun: 9:30-10:30, Mon: 10:30 – 11:30
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**18 Other instructors:**

Name:

Office number:

Phone number:

Email:

Contact hours:

Name:

Office number:

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19 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.



20 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 o closer look to major functions in biology such as energy transformation, transport across membranes, protein synthesis, cell division, and inheritance.

B- Students Learning Outcomes (SLOs):

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

SLOs SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)
1 Recognize the importance of water to life, and the components of biological molecules and				
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 nucleic acid and viruses.				

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction	-	Face to Face	-	-	-	-
	1.2	The Chemistry of Water 3.1. Polar covalent bonds in water molecules result in hydrogen bonding	1	Face to Face	-	-	Exam	Chapter 3 pp 93-98
	1.3	3.2. Four emergent properties of water contribute to Earth's suitability for life	1					Assignment P 101

		Assignment: <i>Acidification: A threat to water quality</i>						
2	2.1	Biological Macromolecules and Lipids 5.1. Macromolecules are polymers, built from monomers	1	Face to Face	-	-	Exam	Chapter 5 P 114 - 134
	2.2	5.2. Carbohydrates serve as fuel and building material	1	Face to Face	-	-	Exam	
	2.3	5.3. Lipids are a diverse group of hydrophobic molecules	1	Face to Face	-	-	Exam	
3	3.1	5.4. Proteins include a diversity of structures, resulting in a wide range of functions	1	Face to Face	-	-	Exam	
	3.2	5.4. Proteins include a diversity of structures, resulting in a wide range of functions	1	Face to Face	-	-	Exam	
	3.3	5.5. Nucleic acids store, transmit, and help express hereditary information	1	Face to Face	-	-	Exam	
4	4.1	Cell Structure and Function 7.1. Biologists use microscopes and biochemistry to study cells Assignment: <i>Microscopes (focus on types and function) and cell fractionation)</i> 7.2. Eukaryotic cells have internal membranes that compartmentalize their functions	2	Face to Face	-	-	Exam	Chapter 7 P 163-191

	4.2	7.3. The eukaryotic cell's genetic instructions are housed in the nucleus and carried out by the ribosomes.	2	Face to Face	-	-	Exam	
	4.3	7.4. The endomembrane system regulates protein traffic and performs metabolic functions	2	Face to Face	-	-	Exam	
5	5.1	7.5. Mitochondria and chloroplasts change energy from one form to another	2	Face to Face	-	-	Exam	
	5.2	7.6. The cytoskeleton is a network of fibers that organizes structures and activities in the cell (Only Table 7.1, page 183)	2	Face to Face	-	-	Exam	
	5.3	7.7. Extracellular components and connections between cells help coordinate cellular activities 7.8 A cell is greater than the sum of its parts	2	Face to Face	-	-	Exam	
6	6.1	Cell Membranes 8.1. Cellular membranes are fluid mosaics of lipids and proteins.	3	Face to Face	-	-	Exam	Chapter 8 P 196-211
	6.2	8.2. Membrane structure results in selective permeability	3	Face to Face	-	-	Exam	
	6.3	8.3. Passive transport is diffusion of a	3	Face to Face	-	-	Exam	

		substance across a membrane with no energy investment						
7	7.1	8.4. Active transport uses energy to move solutes against their gradients	3	Face to Face	-	-	Exam	
	7.2	8.5. Bulk transport across the plasma membrane occurs by exocytosis and endocytosis	3	Face to Face	-	-	Exam	
	7.3	Energy and Life 6.2. The free-energy change of a reaction tells us whether or not the reaction occurs spontaneously	4	Face to Face	-	-	Exam	Chapter 6 pp 145-159
8	8.1	6.3. ATP powers cellular work by coupling exergonic reactions to endergonic reactions	4	Face to Face	-	-	Exam	
	8.2	6.4. Enzymes speed up metabolic reactions by lowering energy barriers	4	Face to Face	-	-	Exam	
	8.3	6.5. Regulation of enzyme activity helps control metabolism	4	Face to Face	-	-	Exam	
9	9.1	Cell Respiration 10.1. Catabolic pathways yield energy by oxidizing organic fuels 10.2. Glycolysis harvests chemical	4					Chapter 10 P 236-256

		energy by oxidizing glucose to pyruvate						
	9.2	10.3. After pyruvate is oxidized, the citric acid cycle completes the energy-yielding oxidation of organic molecules	4	Face to Face	-	-	Exam	
	9.3	10.4. During oxidative phosphorylation, chemiosmosis couples electron transport to ATP synthesis	4	Face to Face	-	-	Exam	
10	10.1	10.5. Fermentation and anaerobic respiration enable cells to produce ATP without the use of Oxygen	4	Face to Face	-	-	Exam	
	10.2	10.6. Glycolysis and the citric acid cycle connect to many other metabolic pathways	4	Face to Face	-	-	Exam	
	10.3	Photosynthetic Processes 11.1. Photosynthesis feeds the biosphere	4	Face to Face	-	-	Exam	Chapter 11 P 259-274
11	11.1	11.2. Photosynthesis converts light energy to the chemical energy of food	4	Face to Face	-	-	Exam	
	11.2	11.3. The light reactions convert solar energy to the chemical energy of ATP and NADPH	4	Face to Face	-	-	Exam	
	11.3	11.4. The Calvin cycle uses the chemical energy of	4	Face to Face	-	-	Exam	

		ATP and NADPH to reduce CO ₂ to sugar						
12	12.1	<p>Mitosis</p> <p>12.1. Most cell division results in genetically identical daughter cells.</p> <p>12.2. The mitotic phase alternates with interphase in the cell cycle.</p> <p>(The evolution of mitosis is not included)</p>	5	Face to Face	-	-	Exam	
	12.2	<p>Sexual Life cycles and Meiosis</p> <p>13.1 Offspring acquire genes from parents by inheriting chromosomes.</p>	5	Face to Face	-	-	Exam	
	12.3	<p>13.2. Fertilization and meiosis alternate in sexual life cycles.</p> <p>(The variety of sexual life cycles is not included)</p>	5	Face to Face	-	-	Exam	
13	13.1	13.3. Meiosis reduces the number of chromosomes sets from diploid to haploid.		Face to Face	-	-	Exam	
	13.2	<p>Nucleic Acids and Inheritance</p> <p>16.1. DNA is the genetic material</p>	6	Face to Face	-	-	Exam	

	13.3	<p>16.2. Many proteins work together in DNA replication and repair</p> <p><i>(Evolutionary significance of altered DNA nucleotides and replicating the ends of DNA molecules are not included).</i></p> <p>16.3 A chromosome consists of a DNA molecule packed together with proteins</p>	6	Face to Face	-	-	Exam	
14	14.1	<p>Expression of Genes</p> <p>17.1. Genes specify proteins via transcription and translation</p> <p><i>Assignment: Nutritional mutations in Neurospora: Scientific Inquiry</i></p>	6	Face to Face	-	-	Exam	Chapter 17 P 385-412
	14.2	<p>17.2. Transcription is the DNA-directed synthesis of RNA: a closer look</p>	6	Face to Face	-	-	Exam	
	14.3	<p>17.3. Eukaryotic cells modify RNA after transcription</p> <p>(The functional and evolutionary importance of introns is not included)</p>	6	Face to Face	-	-	Exam	
15	15.1	<p>17.4. Translation is the RNA-directed synthesis of a polypeptide: a closer look</p>	6	Face to Face	-	-	Exam	

	15.2	17.5. Mutations of one or a few nucleotides can affect protein structure and function	6	Face to Face	-	-	Exam	
	15.3	<p>Introduction to Viruses</p> <p>26.1. A virus consists of a nucleic acid surrounded by a protein coat <i>(Table 26.1 is not included)</i></p> <p>26.2. Viruses replicate only in host cells <i>(Evolution of viruses is not included)</i></p>	6	Face to Face	-	-	Exam	Chapter 26 P 610-620

22 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
First Exam	20	Chapter 3, 5, and 7	1 and 2	To be announced later	In Campus, Computerized
Second Exam	30	Chapters 8, 6, and 10	3 and 4	To be announced later	In Campus, Computerized
Final Exam	50	All the materials	1, 2, 3, 4, 5, and 6	To be announced later	In Campus, Computerized

23 Course Requirements

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

24 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>
- Optional mobile application to access E-Learning platform (Moodle)

25 References:

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

Biology: A Global Approach, 12th Ed. (2021). Neil A.; Lisa A. Urry; Michael L Cain; Steven A. Wasserman; Peter V. Minorsky ; Rebecca B. Orr. 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>

26 Additional information:

Name of Course Coordinator: -- Dr. Khaldoun Al-Hadid ---Signature: ----- Date: -- Oct.9.2022-----
Head of Curriculum Committee/Department: -- Dr. Amer Imraish --- Signature: ----- -----
Head of Department: ----- Dr. Amer Imraish ----- Signature: ----- -----
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----