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**	1st year
11	**Year of study and semester (s)**	2023/2024 First Semester
12	**Other department (s) involved in teaching the course**	N/A
13	**Main teaching language**	English
14	**Delivery method**	X Face to face learning ☐Blended ☐Fully online
15	**Online platforms(s)**	X Moodle ☐Microsoft Teams ☐Skype ☐Zoom ☐Others……
016	**Issuing/Revision Date**	Oct.8.2023

17 Course Coordinator:

Name:	Contact hours:
Office number:	Phone number:
Email	

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18 Other instructors:

Name: Office number: Phone number: Email: Contact hours: Name: Office number: Phone number: Email: Contact hours:

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)	SLO (5)	SLO (6)
1 Recognize the importance of water to life, and the components of biological molecules and	X					
2 Understand cell structure, and function and describe the generalized structure of prokaryotic and eukaryotic cells.	X					
3 Describe how substances cross biological membranes	X					
4 Understand the importance of energy flow as in respiration and photosynthesis.	X					
5 Describe mitosis and meiosis, as well as the cell cycle, and explain the importance of each process in reproduction and growth.	X					
6 Describe the structure and function of nucleic acid and viruses.	X					

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	**Chapter 3: 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 ***Assignment:*** *Acidification: A threat to our oceans*	1					Assignment P 101
2	2.1	**Chapter 5**: **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,	1	Face to Face	-	-	Exam	

		resulting in a wide range of functions						
	3.3	5.5. Nucleic acids store, transmit, and help express hereditary information	1	Face to Face	-	-	Exam	
4	4.1	**Chapter 7: Cell Structure and Function** 7.1. Biologists use microscopes and biochemistry to study cells ***Assignment****: Microscopes (focus on types and function) and cell fractionation)* 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	2	Face to Face	-	-	Exam	

		activities in the cell (Only Table 7.1, page 183)						
	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	**Chapter 8: 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 substance across a membrane with no energy investment	3	Face to Face	-	-	Exam	
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	**Chapter 6: Energy and Life** 6.2. The free-energy change of a reaction tells us whether or	4	Face to Face	-	-	Exam	Chapter 6 pp 145-159

		not the reaction occurs spontaneously						
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	**Chapter 10: Cell Respiration** 10.1. Catabolic pathways yield energy by oxidizing organic fuels	4					Chapter 10 P 236-256
	9.2	10.2. Glycolysis harvests chemical energy by oxidizing glucose to pyruvate	4	Face to Face	-	-	Exam	
	9.3	10.3. After pyruvate is oxidized, the citric acid cycle completes the energy-yielding oxidation of organic molecules	4	Face to Face	-	-	Exam	
10	10.1	10.4. During oxidative phosphorylation, chemiosmosis couples electron transport to ATP synthesis	4	Face to Face	-	-	Exam	

	10.2	10.5. Fermentation and anaerobic respiration enable cells to produce ATP without the use of Oxygen	4	Face to Face	-	-	Exam	
	10.3	10.6. Glycolysis and the citric acid cycle connect to many other metabolic pathways	4	Face to Face	-	-	Exam	
11	11.1	**Chapter 11: Photosynthetic Processes** 11.1. Photosynthesis feeds the biosphere 11.2. Photosynthesis converts light energy to the chemical energy of food	4	Face to Face	-	-	Exam	Chapter 11 P 259-274
	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 ATP and NADPH to reduce CO2 to sugar	4	Face to Face	-	-	Exam	
12	12.1	**Chapter 12: Mitosis** 12.1. Most cell division results in genetically identical daughter cells. 12.2. The mitotic phase alternates with interphase in the cell cycle.	5	Face to Face	-	-	Exam	Chapter 12: 284-294

		(The evolution of mitosis is not included)						
	12.2	**Chapter 13: Sexual Life cycles and Meiosis** 13.1 Offspring acquire genes from parents by inheriting chromosomes.	5	Face to Face	-	-	Exam	Chapter 13: 304-314
	12.3	13.2. Fertilization and meiosis alternate in sexual life cycles. (The variety of sexual life cycles is not included) 13.3. Meiosis reduces the number of chromosomes sets from diploid to haploid.	5	Face to Face	-	-	Exam	
13	13.1	**Chapter 16: Nucleic Acids and Inheritance** 16.1. DNA is the genetic material	6	Face to Face	-	-	Exam	Chapter 16: 364-382
	13.2	16.2. Many proteins work together in DNA replication and repair *(Evolutionary significance of altered DNA nucleotides and replicating the ends of DNA molecules are not included).*	6	Face to Face	-	-	Exam	

	13.3	16.3 A chromosome consists of a DNA molecule packed together with proteins	6	Face to Face	-	-	Exam	
14	14.1	**Chapter 17:** **Expression of Genes** 17.1. Genes specify proteins via transcription and translation ***Assignment**: Nutritional mutations in Neurospora: Scientific Inquiry*	6	Face to Face	-	-	Exam	Chapter 17 P 385-412
	14.2	17.2. Transcription is the DNA-directed synthesis of RNA: a closer look	6	Face to Face	-	-	Exam	
	14.3	17.3. Eukaryotic cells modify RNA after transcription (The functional and evolutionary importance of introns is not included)	6	Face to Face	-	-	Exam	
15	15.1	17.4. Translation is the RNA-directed synthesis of a polypeptide: a closer look	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	**Chapter 26: Introduction to Viruses** 26.1. A virus consists of a nucleic acid surrounded by a protein coat *(Table 26.1 is not included)* 26.2. Viruses replicate only in host cells *(Evolution of viruses is not included)*	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
Midterm Exam	30	Chapter 3, 5, 7, and 8	1 and 2	To be announced later	on Campus, Computerized
Second Exam	20	Chapters 6, 10, and 11	3 and 4	To be announced later	on Campus, Computerized
Final Exam	50	All the material	1, 2, 3, 4, 5, and 6	To be announced later	on Campus, Computerized

23 Course Requirements

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

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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 with 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) (Global Edition). 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: ----------Signature: ----------
Head of Curriculum Committee/Department: ---------- Signature: ----------
Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------