



**The University of Jordan**

**Accreditation & Quality Assurance Center**

**COURSE Syllabus**

1	Course title	General Biology I
2	Course number	0304101
3	Credit hours (theory, practical)	3 credit hours Theory
	Contact hours (theory, practical)	3 hrs weekly
4	Prerequisites/co-requisites	None
5	Program title	B.Sc. in Biological Sciences and service course for many other programs
6	Program code	04
7	Awarding institution	University of Jordan
8	Faculty	Faculty of Science
9	Department	Department of Biological Sciences
10	Level of course	First year
11	Year of study and semester (s)	2017/2018, first semester
12	Final Qualification	NA
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	05/ 11/ 2017

**16. Course Coordinator:**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

*Mrs. Rudaina Y. Muammar; 125 Biology; 12:00-01:00 Sunday, Tuesday, Thursday; Ext. 22224; r.muammar@ju.edu.jo*

**17. Other instructors:**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

**18. 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 division, nucleic acids and inheritance, molecular biology of the gene, expression of genes, and introduction to viruses.

**19. 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 ...

By the 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 move across 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 in daily life and popular culture.

**20. Topic Outline and Schedule:**

*GENERAL BIOLOGY I (304101) Syllabus*  
*3 Credit Hours*  
*First Semester 2017/2018*

Department of Biological Sciences

Lect. No.	Chap . No.	Topic	Pa
1	---	<b>Introduction</b>	
2-3	3	<b>The Chemistry of Water</b> 3.1. The polarity covalent bonds in water molecules result in hydrogen bonding 3.2. Four emergent properties of water contribute to Earth's suitability for life <b>- Assignment: Acidification: A Threat to water quality</b>	94
4-8	5	<b>Biological Macromolecules and Lipids</b> 5.1. Macromolecules are polymers, built from monomers 5.2. Carbohydrates serve as fuel and building material  5.3. Lipids are a diverse group of hydrophobic molecules  5.4. Proteins include a diversity of structures, resulting in a wide range of functions  5.5. Nucleic acids store, transmit, and help express hereditary information	11

9-14	7	<p><b>Cell Structure and Function</b></p> <p>7.1. Biologists use microscopes and the tools of biochemistry to study cells  <b>Assignment: Microscopes (focus on types and function) and cell fractionation.</b></p> <p>7.2. Eukaryotic cells have internal membranes that compartmentalize their functions</p> <p>7.3. The eukaryotic cell's genetic instructions are housed in the nucleus and carried out  by the ribosomes.</p> <p>7.4. The endomembrane system regulates protein traffic and performs metabolic  Functions in the cell</p> <p>7.5. Mitochondria and chloroplasts change energy from one form to another</p> <p>7.6. The cytoskeleton is a network of fibers that organizes structures and activities in the  cell (<b>In brief</b>)</p> <p>7.7. Extracellular components and connections between cells help coordinate cellular  Activities</p>	167-197
15-17	8	<p><b>Cell Membranes</b></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> <p>8.3. Passive transport is diffusion of a substance across a membrane with no  energy  investment</p> <p>8.4. Active transport uses energy to move solutes against their gradients</p> <p>8.5. Bulk transport across the plasma membrane occurs by exocytosis and endocytosis</p>	198-214
18-20	6	<p><b>Energy and Life</b></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> <p>6.4. Enzymes speed up metabolic reactions by lowering energy barriers</p> <p>6.5. Regulation of enzyme activity helps control metabolism</p>	147-163
21-25	10	<p><b>Cell Respiration</b></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> <p>10.3. After pyruvate is oxidized, The citric acid cycle completes the energy-yielding  oxidation of organic molecules</p> <p>10.4. During oxidative phosphorylation, chemiosmosis couples electron  transport to  ATP synthesis</p> <p>10.5. Fermentation and anaerobic respiration enable cells to produce ATP  without the  use of Oxygen</p> <p>10.6. Glycolysis and the citric acid cycle connect to many other metabolic  pathways</p>	238-260
Lect. No.	Chap . No.	<b>Topic</b>	<b>Pages</b>
26-28	11	<b>Photosynthetic Processes</b>	

		11.1. Photosynthesis converts light energy to the chemical energy of food 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 <sub>2</sub> to sugar	261-276
29	12	<b>Mitosis</b> 12.1. Most cell division results in genetically identical daughter cells. 12.2. The mitotic phase alternates with interphase in the cell cycle. ( <i>The evolution of mitosis is not included</i> )	286-295
30-31	13	<b>Sexual Life cycles and Meiosis</b> 13.1 Offspring acquire genes from parents by inheriting chromosomes. 13.2. Fertilization and meiosis alternate in sexual life cycles. (The variety of sexual life cycles is not includes) 13.3. Meiosis reduces the number of chromosome sets from diploid to haploid.	308-319
32-34	16	<b>Nucleic Acids and Inheritance</b> 16.1. DNA is the genetic material 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> ). 16.3 A chromosome consists of a DNA molecule packed together with proteins	368-388
35-39	17	<b>Expression of Genes</b> 17.1. Genes specify proteins via transcription and translation <b>-Assignment: Nutritional mutations in <i>Neurospora</i>: Scientific Inquiry</b> 17.2. Transcription is the DNA-directed synthesis of RNA: <i>a closer look</i> 17.3. Eukaryotic cells modify RNA after transcription ( <i>The functional and evolutionary importance of introns is not included</i> ) 17.4. Translation is the RNA-directed synthesis of a polypeptide: <i>a closer look</i> 17.5. Mutations of one or a few nucleotides can affect protein structure and function	389-415
40-42	26	<b>Introduction to Viruses</b> 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> )	612-622 625-626

## 21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u> :
Lecturing and discussions throughout the semester
PowerPoint presentation and movies
Office Hours

## 22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u> :
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The grade is distributed over online multiple-choice exams as follows:

<b>Description</b>	<b>Weight</b>
<i>First hour exam</i>	30%
<i>Second hour exam</i>	30%
<i>Final exam</i>	40%

### 23. 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:

You should talk to 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:

NA

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's and will be graded automatically.

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

### 24. Required equipment:

**Overhead projectors**

**Data show projectors**

### 25. References:

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

**COURSE TEXT BOOK : Campbell Biology 11<sup>th</sup> Ed. (2017)., Urry, L.A., Cain, M.L.,  
Wasserman, S.A., Minorsky, P.V. & Reece, J. B. Publisher: Pearson.  
Course Information website: [www.bio101a.blogspot.com](http://www.bio101a.blogspot.com)**

B- Recommended books, materials, and media:

<http://www.masteringbiology.com>,

## 26. Additional information:

None

Name of Course Coordinator: **Mrs. Rudaina Y. Muammar** Signature: ----- Date: **05/ 11/**

**2017** Head of curriculum committee/Department: **Dr.Hisham Al Younes** Signature: -----

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Head of Department: **Dr Hana Alebous** Signature: -----

Head of curriculum committee/Faculty:                      Signature: -----

Dean: **Dr Sami Mahmoud** Signature: -----

Copy to:

Head of Department  
Assistant Dean for Quality Assurance  
Course File