

## Course E-Syllabus

1	Course title	Cell Biology
2	Course number	5501232
3	Credit hours	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	General Biology (2) 5501102
5	Program title	Bachelor in Marine Biology
6	Program code	5501
7	Awarding institution	The University of Jordan–Aqaba
8	School	Faculty of Basic and Marine Sciences
9	Department	Biology
10	Level of course	Second year
11	Year of study and semester (s)	Second semester 2019/2020
12	Final Qualification	BSc.
13	Other department (s) involved in teaching the course	non
14	Language of Instruction	English
15	Teaching methodology	<input type="checkbox"/> Blended <input checked="" type="checkbox"/> Online
16	Electronic platform(s)	<input type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input checked="" type="checkbox"/> Zoom
		<input type="checkbox"/> Others: <ul style="list-style-type: none"> <li>• Facebook</li> <li>• Messenger</li> <li>• Whatsapp</li> <li>• E-mail (University)</li> <li>• E- Learning website ( University)</li> </ul>
17	Date of production/revision	26/1/2020

### 18 Course Coordinator:

\*\* Instructor : Majduleen Sbaihat.  
 \*\* E-mail: [m.sbaihat@ju.edu.jo](mailto:m.sbaihat@ju.edu.jo)  
 \*\* Office hours: ( Tues., Thers.) → 10:00 -11:00 ( Wed.) → 9:30 - 11:00  
 \*\* Office #: Faculty of Marine Sciences – Room # 1  
 \*\* Phone Numbers : 032090450 Ext. 35079

**19 Other instructors:**

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**20 Course Description:**

<p>This course deals with the cell as a unit of structure and function of all living organisms. It includes: Cell theory. Principles and technology of microscopy, biological membranes: Ultrastructure and function and their role in controlling cellular responses to cell matrix. Intracellular compartments: Endoplasmic reticulum, golgi complex, lysosomes and peroxisoms ultrastructure and function. Energy transformers: Mitochondria and chloroplasts. The course concentrates also on the nuclear ultrastructure. Chromatin and DNA packaging. Nucleolus and ribosome's biosynthesis. Cell cycle and mechanism of cell division. Also studies cellular junctions. Adhesions and extracellular structures. Cell-to-substratum interactions. Transient differentiations associated with surface activity. Motile cell processes. Plant cell wall and plasmodesmata and bacterial cell wall. The course investigates also the ultrastructure and functions of cytoskeleton. Other topics covered by the course include cellular movement: motility and contractility and cell-to cell signaling as well as the cellular aspects of cancer, aging and death.</p>
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**21 Course aims and outcomes:**

## **A- Aims:**

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

- 1- Define the cell as a unit of structure and function of all living organisms. It includes: Cell theory, Modern Cell Biology.
- 2- Identify the chemistry of the cell, include: characteristics of carbon, characteristics of water, selectively permeable membranes, synthesis by polymerization of small molecules and self assembly.
- 3- Identify plant and animal cell organelles and describe their structure and functions, and study the intracellular compartments: endoplasmic reticulum, golgi complex, lysosomes and peroxisoms ultrastructure and function. Energy transformers: mitochondria and chloroplasts. Also the course concentrates also on the nuclear ultrastructure. Chromatin and DNA packaging. Nucleolus and ribosome's biosynthesis. Cell cycle and mechanism of cell division. Also studies cellular junctions. Adhesions and extracellular structures. Cell-to-substratum interactions. Transient differentiations associated with surface activity. Motile cell processes. Plant cell wall and plasmodesmata and bacterial cell wall. The course investigates also the ultrastructure and functions of cytoskeleton.
- 4- Describe the agents that invade cells: Viruses, Viroids, and Prions.
- 5- Identify the Membranes: Their Structure, Function, and Chemistry. Also identify cellular movement: motility and contractility and cell-to cell signalling.
- 6- Identify Important Technique for Lipid and Protein Analysis. For examples: Thin-Layer Chromatography (TLC) , Fluorescence Recovery After Photobleaching (FRAP), Freeze-Fracture Analysis of Membranes, SDS-Polyacrylamide Gel Electrophoresis.
- 7- Study the processes related to transport across membrane: simple diffusion, facilitated diffusion, passive transport and active transport.

## **B- Intended Learning Outcomes (ILOs):**

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

### **Learning outcomes:**

#### **• Knowledge and understanding**

At the end of this module, students will be able to:

- 0- Define the cell as a unit of structure and function of all living organisms. It includes: Cell theory, Modern Cell Biology.
- 1- Identify the chemistry of the cell, include: characteristics of carbon, characteristics of water, selectively permeable membranes, synthesis by polymerization of small molecules and self assembly.
- 2- Identify plant and animal cell organelles and describe their structure and functions.
- 3- Describe the agents that invade cells: Viruses, Viroids, and Prions.
- 4- Identify the Membranes: Their Structure, Function, and Chemistry. Also identify cellular movement: motility and contractility and cell-to cell signalling.
- 5- Identify Important Technique for Lipid and Protein Analysis. For examples: Thin-Layer Chromatography (TLC) , Fluorescence Recovery After Photobleaching (FRAP), Freeze-Fracture Analysis of Membranes, SDS-Polyacrylamide Gel Electrophoresis.
- 6- Describe and identify the processes related to transport across membrane: simple diffusion, facilitated diffusion, passive transport and active transport.

## ۲۲. Topic Outline and Schedule:

Week	Lecture	Topic	Teaching Methods*/platform	Evaluation Methods**	References
1	1.1	<b>A Preview of the Cell Cell Theory, Modern Cell Biology</b>	Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	1.2		Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	1.3		Synchronous lecturing/meeting ( in class)	Questions, Discussion, Homeworks.	<i>Becker's World of the Cell</i>
2	2.1		Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	2.2		Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	2.3		Synchronous lecturing/meeting ( in class)	Questions, Discussion, Homeworks, Quizes.	<i>Becker's World of the Cell</i>
3	3.1	<b>The Chemistry of the Cell</b>	Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	3.2		Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	3.3		Synchronous lecturing/meeting ( in class)	Questions, Discussion, Homeworks.	<i>Becker's World of the Cell</i>
4	4.1		Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	4.2		Synchronous lecturing/meeting ( in class)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	4.3		Synchronous lecturing/meeting ( in class)	Questions, Discussion, Homeworks, Quizes.	<i>Becker's World of the Cell</i>
5	5.1	<b>Cells and Organelles</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	5.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	5.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion, Homeworks,	<i>Becker's World of the Cell</i>
6	6.1		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	6.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	6.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
7	7.1	<b>Membranes: Their Structure, Function, and Chemistry</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>

	7.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	7.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion, Homeworks,	<i>Becker's World of the Cell</i>
8	8.1		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	8.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	8.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
9	9.1	<b>Transport Across Membranes</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	9.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	9.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion, Homeworks,	<i>Becker's World of the Cell</i>
10	10.1		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	10.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	10.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
11	11.1	<b>Chemotrophic Energy Metabolism: Aerobic Respiration, and Mitochondrion</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	11.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	11.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
12	12.1	<b>Phototrophic Energy Metabolism: Photosynthesis</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	12.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	12.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
13	13.1	<b>The Endomembrane System and peroxisomes</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	13.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	13.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
14	14.1	<b>Signal Transduction Mechanisms II: Messengers and</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>

		<b>Receptors</b>			
	14.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	14.3		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
15	15.1	<b>Cytoskeletal Systems</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	15.2		Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
16	15.3	<b>Cellular Movement: Motility and Contractility</b>	Asynchronous lecturing/meeting (online / zoom)	Questions, Discussion.	<i>Becker's World of the Cell</i>
	16.1				
	16.2				
	16.3				

- Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
- Evaluation methods include: Homework, Quiz, Exam, pre-lab quiz...etc

### 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
Quiz - 1	10	A Preview of the Cell Cell Theory, Modern Cell Biology	1 - 2	Lecture in class
Quiz - 2	10	The Chemistry of the Cell	3 - 4	Lecture in class
Homework - 1	5	Membrane Proteins	5 - 6	E-Learning ( University Website)
Homework - 2	5	Membrane Fluidity	7 - 8	E-Learning ( University Website)
Homework - 3	5	Rate of Diffusion	9 - 10	E-Learning ( University Website)
Scientific Report	10	Any topic related to course material	14 - 15	E-Learning ( University Website)
Presentation	15	Any topic related to course material	Through semester	Online ( Zoom)
<b>Final Exam</b>	<b>50</b>	<b>All course material, Except: chapter 1 &amp; 2.</b>	<b>17/5/2020</b>	<b>Online</b>

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

Students should have a computer, internet connection, webcam, account on a specific software/platform...etc.

**☞ Course Policies:**

**A- Attendance policies:**

**1- I strongly recommend you attend every lecture. Missing any lecture will put you at a distinct disadvantage when test taken.**

**2- Any student with seven or more unexcused absences from lecture can be legally dropped from the course.**

**B- Absences from exams and submitting assignments on time:**

**The only valid excuses for missing an exam are: death in the family, illness, or accident. In this case you must provide evidence of some kind and you must report me within 3 days.**

**C- Health and safety procedures:**

**Students who miss the exam due to illness or other excuse must notify me within the first week after the exam, so make up arrangements can be Made.**

**D- Honesty policy regarding cheating, plagiarism, misbehavior:**

- 1. Students are not expected to talk in class while the instructor is lecturing**
- 2. After two warning of taking or any other classroom disruption, the Student will be automatically removed from the class.**
- 3. Any act of cheating, or academic misconduct is subject to penalties.**
- 4. The minimum penalty for any students caught cheating will receive a zero on that test.**

**E- Grading policy:**

<b>Type</b>	<b>Grading</b>
Quizzes	10%
Home work / Assignments	15 %
Presentation / Participation	15 %
Scientific Report:	10%
Final Exam:	50 %
<b>Total</b>	<b>100%</b>

**Exams:** The examinations will consist of any combination of Multiple choice, short answer, fill in the blank, matching, identification of figures or essay questions.

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

**Library sources are available, internet, laboratory facilities.**

**۲۶ References:**

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

**Textbook:** We will use the text “*Becker’s World of the Cell*” by the authors: Hardin, Bertoni and Kleinsmith. *8<sup>th</sup> Edition*. Pearson Publishing, ©2012

**Supplementary reading:** [www.thecellplace.com](http://www.thecellplace.com)

B- Recommended books, materials and media:

**۲۷ Additional information:**

Name of Course Coordinator: **Majduleen Ali Sbaihat** . Signature: ----- Date: **5/6/2020**

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

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

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

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