



Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
	The Date of the Deans Council Approval Decision	23/01/2023
	Number of Pages	06

1.	Course Title	Cell and Molecular Biology
2.	Course Number	0304105
3.	Credit Hours (Theory, Practical)	4
	Contact Hours (Theory, Practical)	(4,0)
4.	Prerequisites/ Corequisites	-
5.	Program Title	B.Sc. in Medicine and B.Sc. in Dentistry
6.	Program Code	05
7.	School/ Center	Science
8.	Department	Biological Sciences
9.	Course Level	1 st year
10.	Year of Study and Semester (s)	2023/2024 Second
11.	Other Department(s) Involved in Teaching the Course	N/A
12.	Main Learning Language	English
13.	Learning Types	Face to face
14.	Online Platforms(s)	<input type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams
15.	Issuing Date	
16.	Revision Date	24/2/2024

17. Course Coordinator:

Name: Dr. Amer Imraish	Contact hours: Monday & Wednesday 11:00-12:30
Office number: 301	Phone number:
Email: a.imraish@ju.edu.jo	
Name: Dr. Khaldoun Al-Hadid	Contact hours: Sun: 10:30-11:30, Mom:11:00-12:00
Office number: 208	
Email: kalhadid@ju.edu.jo	



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.

This is a four-credit hour course mandatory for first-year students of medicine and dentistry. The course is designed to introduce students to the basics of cellular and molecular biology. The basics include the study of cell structure and the function of cell components, the chemical structure of the genetic material, molecular processes such as replication, transcription, and translation, in addition to the study of basic molecular biology tools and techniques.

20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

SLO (1) An ability to identify, formulate, and solve broadly-defined technical or Scientific problems by applying knowledge of mathematics and science and /or technical topics to areas relevant to discipline.

SLO (2) An ability to formulate or design a system, process, procedure or program to meet desired needs.

SLO (3) An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgement to draw conclusions.

SLO (4) An ability to communicate effectively with a range of audiences.

SLO (5) An ability to understand ethical and professional responsibilities and the impact of technical and /or scientific solutions in global, economic, environmental, and societal contexts.

SLO (6) An ability to function effectively on teams that establish goals plan tasks, meet deadlines and analyze risk and uncertainty

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)



1. Learn the overall cellular and molecular components of cells.
2. Understand the structure of membranes of eukaryotic cells and its role in transport.
3. Understand the structure and role of the endoplasmic reticulum and Golgi complex in protein synthesis and sorting.
4. Understand the structure and organization of the cytoskeleton.
5. Recall the different components of the extracellular matrix.
6. Recall the different modes of cell signaling with emphasis on cell surface receptors and their intracellular signaling molecules and their cellular effects.
7. Describe the DNA, RNA and chromosomes structures.
8. Describe DNA replication process and DNA repair.
9. Describe the gene transcription process in prokaryotes and eukaryotes.
10. Describe translation in prokaryotes and eukaryotes and process.
11. Describe the regulation of gene expression in prokaryotes and eukaryotes.
12. Describe the theoretical basis of some methods in molecular biology such as DNA extraction, Southern blot, and sequencing.

Course ILOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analysing	evaluating	Creating
1	x					
2	x	x				
3	x	x				
4	x	x				
5	x					
6	x					

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program ILOs / Course ILOs	ILO (1)	ILO (2)	ILO (3)	ILO (4)	ILO (5)	ILO (6)



1	X		X			
2	X		X			
3	X		X			
4	X		X			
5	X		X			
6	X		X			

23. Topic Outline and Schedule for the cell part:

Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous	Evaluation Methods
1	1.1	CHAPTER 1: Introduction to the Study of Cell and Molecular Biology 1.1 The Discovery of Cells 1.2 Basic Properties of Cells 1.3 Two Fundamentally Different Classes of Cells	1	Face to Face	-	-	Exam
	1.2	CHAPTER 4: The Structure and Function of the Plasma Membrane 4.1 Introduction to the Plasma Membrane 4.2 The Chemical Composition of Membranes 4.3 Membrane Proteins	1,2	Face to Face	-	-	Exam
2	2.1	4.4 Membrane Lipids and Membrane Fluidity 4.5 The Dynamic Nature of the Plasma Membrane	1,2	Face to Face	-	-	Exam
	2.2	4.6 The Movement of Substances across Cell Membranes	1,2	Face to Face	-	-	Exam
3	3.1	CHAPTER 8: Cytoplasmic Membrane Systems: Structure, Function, and Membrane Trafficking 8.1 An Overview of the Endomembrane System 8.2 A Few Approaches to the Study of Endomembranes 8.3 The Endoplasmic Reticulum	1,3	Face to Face	-	-	Exam
	3.2	8.4 The Golgi Complex 8.5 Types of Vesicle Transport 8.7 Lysosomes	1,3	Face to Face	-	-	Exam
4	4.1	8.9 The Endocytic Pathway: Moving Membrane and Materials into the Cell Interior 8.10 Posttranslational Uptake of Proteins by Peroxisomes, and Mitochondria	1,3	Face to Face	-	-	Exam
	4.2	CHAPTER 9: The Cytoskeleton and Cell Motility 9.1 Overview of the Major Functions of the Cytoskeleton 9.2 Structure and Function of Microtubules	1,4	Face to Face	-	-	Exam
5	5.1	9.4 Motor Proteins: Kinesins and Dyneins 9.5 Microtubule-Organizing Centers (MTOCs)	1,4	Face to Face	-	-	Exam



	5.2	9.7 Intermediate Filaments 9.8 Actin and Myosin	1,4	Face to Face	-	-	Exam
6	6.1	CHAPTER 7: Interactions Between Cells and Their Environment 7.1 Extracellular Interactions 7.3 Interactions of Cells with Extracellular Materials	1,5	Face to Face	-	-	Exam
	6.2	7.4 Interactions of Cells with Other Cells 7.5 Tight Junctions: Sealing the Extracellular Space 7.6 Intercellular Communication	1,5	Face to Face	-	-	Exam
	7.1	CHAPTER 15: Cell Signaling and Signal Transduction: Communication between Cells 15.1 The Basic Elements of Cell Signaling Systems 15.2 A Survey of Extracellular Messages and Their Receptors 15.3 G Protein-Coupled Receptors and Their Second Messengers	1,6	Face to Face	-	-	Exam
7	7.2	15.5 Protein-Tyrosine Phosphorylation as a Mechanism for Signal Transduction 15.8 Convergence, Divergence, and Cross-Talk among Different Signaling Pathways 15.10 Apoptosis (Programmed Cell Death)	1,6	Face to Face	-	-	Exam

23. Topic Outline and Schedule for the Molecular Biology part:

Chapter 1: Introduction to Molecular Biology	1-22
Chapter 3: Nucleic Acid Structure	81-108, (Triplex Structures... is Not included), (Quadruplex Structures.... Not included)
Chapter 4: Molecular Biology Technology	113-140, (TEM and Equilibrium gradient centrifugation is not included, Equilibrium gradient centrifugation is Not included, Restriction endonucleases can be used to construct a restriction map of a DNA molecule is Not included, Shotgun Sequencing of Genomes is Not included, New Sequencing Advances is Not included)
Chapter 5: Chromosomes	151-177, (X-ray crystallography reveals the atomic structure of nucleosome core particles...is Not included), (Figure 5.25 is not included)
Chapter 8: DNA Replication	265-305, (Figure 8.6 is not included, figure 8.8 is not included, Mutant studies provide important information....is Not included, DNA polymerase III holoenzyme has threeNot included, The core polymerase has oneis Not included, Figure: 8.17 Not included, Yeast origins of replication, called....Not included, Studies of the tetrahymena... is not Included, The Telomerase plays....Not included).
Chapter 9: DNA Repair	319-347, (Many environmental...Not included, Mutagens and carcinogen Detection is Not included, O6-



	Alkylguanine.... Not included, SOS Response.....is Not included)
Chapter 12: Bacterial Transcription and Its regulation	407-443, (Genetic studies provide information....is Not included, DNA footprint shows that.....is Not included, Bacterial RNA polymerase crystal structure shows....is Not included, Figure 12.4 is Not included, Figure 12.11 is not included, Figure 12.17 Not included, The Lac repressor binds to theis Not included)
Chapter 14: RNA Polymerase II: Cotranscriptional & Post transcriptional processes	From the recorded lecture on the elearning
Chapter 16: Protein Synthesis	647 -688 (Eukaryotic ribosomes exist...is Not included, Synthetic messengers with...is Not included, Nascent polypeptideis Not included)

24. Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform
Mid-term Exam	50	Cell Biology Part	1-6	To be Announced	Computerized in campus
Final Exam	50	Molecular Biology Part	7-12	To be Announced	Computerized in campus

25. Course Requirements:

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

26. Course Policies:



A- Attendance policies:

Students are allowed to not attend seven lectures (15%) in the whole semester. In this case, students must attend every lab weekly. If a student does not attend a lab, then he/she has a maximum number of four lectures to skip.

B- Absences from exams and submitting assignments on time:

If a student does not attend an exam, he/she will get zero grade in that exam, unless he/she shows a medical report that proves he/she could not attend the exam. In this case, a makeup exam will be offered to the student as soon as possible.

C- Health and safety procedures:

Students need to be aware of the basic procedure of laboratory safety. Part of the first lab in the first week of the semester is assigned to teach students these basic laboratory procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

University regulations will be implemented for any cheating attempt, plagiarism, and misbehavior.

E- Grading policy:

50% will be counted for the Cell Biology lectures, 50% will be counted for the Molecular Biology lectures

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

The university provides the e-learning platform and the technical support.

27. References:

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

Karp's Cell and Molecular Biology, JANET IWASA and WALLACE MARSHALL, Ninth Edition, 2020

Principles of Molecular Biology by Burton E, Tropp_ 1st Ed._ 2014

B- Recommended books, materials, and media:

1. The Cell: A Molecular Approach, Geoffrey M. Cooper and Robert E. Hausmann, 8th edition, Sinauer Associates, 2019.
2. The World of the cell. Becker et al (2020). 10th Edition. Benjamin and Cummings Company, California.

28. Additional information:



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Name of the Instructor or the Course Coordinator:	Signature:	Date:
Dr. Amer Imraish	<i>Amer Imraish</i>	24/2/2024

Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
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Name of the Head of Department	Signature:	Date:
.....

Name of the Head of Quality Assurance Committee/ School or Center	Signature:	Date:
.....

Name of the Dean or the Director	Signature:	Date:
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