Form: Course Syllabus		
	Form Number	EXC-01-02-02A
	Issue Number and Date	2963/2022/24/3/2 5/12/2022
	Number and Date of Revision or Modification	2/(10/12/2023)
	Deans Council Approval Decision Number	50/2023
	The Date of the Deans Council Approval Decision	26/12/2023
	Number of Pages	06

1.	**Course Title**	Cell Biology for Dental Students
2.	**Course Number**	0334105
3.	**Credit Hours (Theory, Practical)**	3 credit hours
	Contact Hours (Theory, Practical)	Theory: 3 hrs weekly
4.	**Prerequisites/ Corequisites**	0304101
5.	**Program Title**	B.Sc. in Biological Sciences
6.	**Program Code**	04
7.	**School/ Center**	The University of Jordan
8.	**Department**	Science
9.	**Course Level**	2nd
10.	**Year of Study and Semester (s)**	
11.	**Other Department(s) Involved in Teaching the Course**	None
12.	**Main Learning Language**	English
13.	**Learning Types**	☑Face to face learning ☐Blended ☐Fully online
14.	**Online Platforms(s)**	☑Moodle ☑Microsoft Teams
15.	**Issuing Date**	1/9/2024
16.	**Revision Date**	

17. Course Coordinator:

Name: Dr. Amer Imraish Contact hours: Monday and Wednesday (11:30-13:00)

Office number: 301 Phone number:

Email: a.imraish@ju.edu.jo

18. Other Instructors:

19. Course Description:

The course is designed to introduce students to the basics of cellular biology. Students will explore major concepts in cell biology including eukaryotic cell structure and function, the cellular use of biomolecules, membranes, signal transduction, motility, the extracellular matrix, cell interactions, regulation, and death. Examples of well-known disease mechanisms are discussed. Therapeutic approaches and relationships to underlying disease mechanisms are included to illustrate how interventions at the cell biological level restore normal function. Students will engage in techniques appropriate to the study of cells and cellular processes and gain experience in experimental design, and data analysis and interpretation.

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)

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.**
2. **An ability to formulate or design a system, process, procedure or program to meet desired needs.**
3. **An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgement to draw conclusions.**
4. **An ability to communicate effectively with a range of audiences.**
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.**
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 of the nucleus and the nuclear membrane.
5. Understand the structure and organization of the cytoskeleton and extracellular matrix.
6. Recall the molecular components biological processes such as apoptosis, autophagy and cancer biology.
7. Recall the different modes of cell signaling with emphasis on cell surface receptors and their intracellular signaling molecules, immune response and their cellular effects.

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

23. Topic Outline and Schedule:

Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1.1	Introduction to cell 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	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	1.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
2	2.1	Cellular membrane: 4.1 Introduction to the Plasma Membrane 4.2 The Chemical Composition of Membranes 4.3 Membrane Proteins 4.4 Membrane Lipids and Membrane Fluidity 4.5 The Dynamic Nature of the Plasma Membrane 4.6 The Movement of Substances across Cell Membranes		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	2.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
3	3.1	Mitochondrion and Peroxisomes 5.1 Mitochondrial Structure and Function 5.7 Peroxisomes		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books

		Diseases That Result from Abnormal Mitochondrial or Peroxisomal Function						
	3.2	Cellular organelles 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 8.4 The Golgi Complex 8.5 Types of Vesicle Transport 8.7 Lysosomes 8.9 The Endocytic Pathway: Moving Membrane and Materials into the Cell Interior 8.10 Posttranslational Uptake of Proteins by Peroxisomes, Mitochondria lysosomal storage diseases		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
4	4.1			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	4.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	5.1			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
5	5.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	6.1	Structure and function of the cell nucleus 12.5 The Nucleus as an Organized Organelle		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
6	6.2	The cytoskeleton: Microtubules. MTOC. 9.1 Overview of the Major Functions of the Cytoskeleton 9.2 Structure and Function of Microtubules 9.4 Motor Proteins: Kinesins and Dyneins 9.5 Microtubule-Organizing Centers (MTOCs)		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books

7	7.1	The cytoskeleton: Intermediate filaments 9.7 Intermediate Filaments		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	7.2	The cytoskeleton: Microfilaments. Myosin. Muscle contractility and cellular motility 9.8 Actin and Myosin 9.11 Actin-Binding Proteins		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
8	8.1	The extracellular matrix and cell interactions 7.1 Extracellular Interactions		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	8.2	7.2 Engineering Linkage: Organoids 7.3 Interactions of Cells with Extracellular Materials 7.4 Interactions of Cells with Other Cells 7.5 Tight Junctions: Sealing the Extracellular Space 7.6 Intercellular Communication		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
9	9.1	Cell signaling pathways: GPCR 15.1 The Basic Elements of Cell Signaling Systems		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	9.2	15.2 A Survey of Extracellular Messages and Their Receptors 15.3 G Protein-Coupled Receptors and Their Second Messengers		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
10	10.1	Cell signaling pathways: RTK 15.5 Protein-Tyrosine Phosphorylation as a Mechanism for Signal Transduction 15.8 Convergence, Divergence, and Cross-Talk among Different Signaling Pathways		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books

	10.2	Cell division: Regulation of the cell cycle		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
11	11.1	Cell division: Regulation of the cell cycle **14.1 The Cell Cycle**		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	11.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
12	12.1	Immune Response An Overview of the Immune Response T Lymphocytes: Activation and Mechanism of Action Selected Topics on the Cellular and Molecular Basis of Immunity Signal Transduction Pathways in Lymphocyte Activation 17.1 An Overview of the Immune Response 17.4 T Lymphocytes: Activation and Mechanism of Action 17.5 Selected Topics on the Cellular and Molecular Basis of Immunity 17.7 Signal Transduction Pathways in Lymphocyte Activation		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	12.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
13	13.1	Apoptosis (Programmed Cell Death) Features of apoptosis The Extrinsic Pathway of Apoptosis		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	13.2			Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books

		The Intrinsic Pathway of Apoptosis Necroptosis 15.10 Apoptosis (Programmed Cell Death)						
14	14.1	Cancer Basic Properties of a Cancer Cell The Causes of Cancer		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books
	14.2	16.1 Basic Properties of a Cancer Cell 16.2 The Causes of Cancer 16.6 Strategies for Combating Cancer		Face to Face	MS Teams + Moodle	Synchronous	Assignments + Exams	Recommended books

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	30	TBA	1,2	TBA	TBA
Assignments / Quizzes	20	TBA	3,4	TBA	TBA
Final Exam	50	TBA	1-6	TBA	TBA

25. Course Requirements:

Students should have access to a computer, internet connection, MS teams and moodles account, Prism software

26. 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 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- Hone All violations pertaining to cheating, plagiarism, misbehaviour will be dealt with in accordance to the rules outlined in your student handbook.sty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy:

All exams are made up of the following question forms: multiple choice questions, True or False questions, matching questions, essay questions, "fill in the blank" questions.

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

Computer laboratory with Prism software installed on the machines.

27. References:

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

Karp's Cell Biology. 9th edition (Global Edition). By: Iwasa and Marshal, John Wiley & Sons, 2020.

B- Recommended books, materials, and media:

1. The Cell: A Molecular Approach, Geoffrey M. Cooper and Robert E. Hausmann, 6th edition, Sinauer Associates, 2013.
2. The World of the cell. Becker et al (2017). 9th Edition. Benjamin and Cummings Company, California.
3. Online resources.

28. Additional information:

Name of the Instructor or the Course Coordinator: ……Dr. Amer Imraish……	Signature: ……..……	Date: ……..……
Name of the Head of Quality Assurance Committee/ Department …….	Signature: ……..……	Date: ……..……
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: ……..……