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	2023/10/15
	Deans Council Approval Decision Number	265/2024/24/3/2
	The Date of the Deans Council Approval Decision	2024/1/23
	Number of Pages	06

1.	**Course Title**	Biophysics for dental students
2.	**Course Number**	0302110
3.	**Credit Hours (Theory, Practical)**	(3, 0)
	Contact Hours (Theory, Practical)	(48, 0)
4.	**Prerequisites/ Corequisites**	0342105
5.	**Program Title**	Physics
6.	**Program Code**	0302
7.	**School/ Center**	University of Jordan/ Science
8.	**Department**	Physics
9.	**Course Level**	First Year
10.	**Year of Study and Semester (s)**	First Year, second semester
11.	**Program Degree**	DDS
12.	**Other Department(s) Involved in Teaching the Course**	Non
13.	**Learning Language**	English
14.	**Learning Types**	☒Face to face learning ☐Blended ☐Fully online
15.	**Online Platforms(s)**	☒Moodle ☒Microsoft Teams
16	**Issuing Date**	12-9-2025
17.	**Revision Date**	30-9-2025

18. Course Coordinator:

Name: Ahmad S Masadeh Contact hours: Sunday & Monday 11 -12

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19. Other Instructors:

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

20. Course Description:

This course aims to provide students with the basic concepts in biophysics with particular emphasis on concepts related to dentistry including material properties, radiation physics, adhesion and material interaction, mechanical testing of materials and interface, and mechanobiology of tissues, cells and biofilms. Applications related to dentistry are given thorough the course.

21. 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)

PILO's	*National Qualifications Framework Descriptors*		
	Competency (C)	Skills (B)	Knowledge (A)
1.	☒	☒	☒
2.	☐	☐	☐
3.	☒	☒	☒
4.	☐	☐	☐
5.	☒	☒	☒

* Choose only one descriptor for each learning outcome of the program, whether knowledge, skill, or competency.

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

Course ILOs #	The learning levels to be achieved						Competencies
	Remember	Understand	Apply	Analyse	Evaluate	Create	
1.	X	X	X	X	X		
2.	X	X	X	X	X		
3.	X	X	X	X	X	X	
4.	X	X	X	X	X		
5.	X	X	X	X	X		

23. The matrix linking the intended learning outcomes of the course -CLO's with the intended learning outcomes of the program -PILOs:

PILO's * / CLO's	1	2	3	4	5	Descriptors**		
						A	B	C
1	X							
2		X						
3		X						
4			X					
5			X					
6				X				
7	X							
8					X			

***Linking each course learning outcome (CLO) to only one program outcome (PLO) as specified in the course matrix.**

****Descriptors are determined according to the program learning outcome (PLO) that was chosen and according to what was specified in the program learning outcomes matrix in clause (21).**

24. 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 Materials Science	ILO1 ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	1.2	What is Materials Science and Engineering	ILO1 ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	1.3	Classification of Materials	ILO1 ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
2	2.1	Functional Classification of Materials	ILO1 ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	2.2	Classification of Materials Based on Structure	ILO1 ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	2.3	Environmental and Other Effects	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
3	3.1	The Structure of Materials:	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
	3.2	The Structure of the Atom	ILO1	**Face to Face**	MST	NA	Exams	Text book

								and slides
	3.3	The Electronic Structure of the Atom	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
4	4.1	The Periodic Table	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
	4.2	Atomic Bonding	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
	4.3	Binding Energy and Interatomic Spacing	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
5	5.1	The Many Forms of Carbon:	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
	5.2	Short- vs. Long-Range Order	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
	5.3	Amorphous Materials	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
6	6.1	Lattice, Basis, Unit Cells & Crystal Structures	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
	6.2	Allotropic or Polymorphic Transformations	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
	6.3	Points, Directions & Planes in the Unit Cell	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides

7	7.1	Interstitial Sites	ILO1	**Face to Face**	MST	NA	Exams	Text book and slides
	7.2	Crystal Structures of Ionic Materials	ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	7.3	Covalent Structures	ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
8	8.1	Imperfections in the Atomic and Ionic Arrangement	ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	8.2	Point Defects	ILO2	**Face to Face**	MST	NA	Exams	Text book and slides
	8.3	Other Point Defects	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
9	9.1	Applications of Diffusion	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
	9.2	Stability of Atoms & Ions	ILO3	**Face to Face**	MST	NA	Exams	Text book and slides
	9.3	Mechanisms for Diffusion	ILO3	**Face to Face**	MST	NA	Exam/HW	Text book and slides
10	10.1	Activation Energy for Diffusion	ILO3	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	10.2	Rate of Diffusion (Fick's 1st Law)	ILO3	**Face to Face**	MST	NA	Exam/HW	Text book

								and slides
	10.3	Factors Affecting Diffusion: Diffusion & Materials Processing	ILO4	**Face to Face**	MST	NA	Exam/HW	Text book and slides
11	11.1	Technological Significance: Terminology for Mechanical Properties	ILO4	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	11.2	The Tensile Test: Use of Stress Strain Diagram	ILO4	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	11.3	Properties Obtained from the Tensile Test	ILO3	**Face to Face**	MST	NA	Exam/HW	Text book and slides
12	12.1	True Stress & True Strain	ILO1	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	12.2	Hardness of Materials	ILO2	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	12.3	Practices	ILO1	**Face to Face**	MST	NA	Exam/HW	Text book and slides
13	13.1	Heat Capacity & Specific Heat	ILO2	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	13.2	Thermal Expansion	ILO1	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	13.3	Thermal Conductivity and Thermal Shock	ILO2	**Face to Face**	MST	NA	Exam/HW	Text book and slides

14	14.1	Ceramics in Dentistry & Polymers in Dentistry	ILO1	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	14.2	Metals in Dentistry & Cements in Dentistry	ILO2	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	14.3	Adhesives	ILO1	**Face to Face**	MST	NA	Exam/HW	Text book and slides
15	15.1	Note on Glass Ionomer Cements (GICs	ILO2	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	15.2	Note on Porcelain-Fused-To-Metal (PFM) Restorations	ILO1	**Face to Face**	MST	NA	Exam/HW	Text book and slides
	15.3	Note on Resin Materials In Dental Applications	ILO2	**Face to Face**	MST	NA	Exam/HW	Text book and slides

25. Evaluation Methods:

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

Evaluation Activity	***Mark wt.**	**CILO's**					
		1	**2**	**3**	**4**	**5**	**6**
First Exam	25	X	X				
Second Exam –If any	25	X	X				
Final Exam	50	X	X	X		X	
**Class work							
Projects/reports							

Research working papers							
Field visits							
Practical and clinical							
Performance Completion file							
Presentation/ exhibition							
Any other approved works							
Total 100%	100						

*** According to the instructions for granting a Bachelor's degree.**

****According to the principles of organizing semester work, tests, examinations, and grades for the bachelor's degree.**

Mid-term exam specifications table*

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark	Total no. of questions	CILO/ Weight	CILO no.
Create **%10**	Evaluate **%10**	analyse **%10**	Apply %20	Understand **%20**	Remember %30					
1	1	1	4	2	1	10	100	100	10%	1

Final exam specifications table

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark	Total no. of questions	CILO Weight	CILO no.
Create **%10**	Evaluate **%10**	analyse **%10**	Apply %20	Understand **%20**	Remember %30					
										1
										2
										3
										4
										5

26. Course Requirements:

White board and overhead projector.

27. Course Policies:

A- Attendance policies: Regular attendance according to the rules of the host institution B- Absences from exams and handing in assignments on time: Based on the rules of the host institution. C- Health and safety procedures: Based on the rules of the host institution D- Honesty policy regarding cheating, plagiarism, misbehavior: According the rules of the host institution E- Grading policy: Grading the exam based on a key solution. F- Available university services that support achievement in the course: e-learning.

28. References:

A- Required book(s), assigned reading and audio-visuals: Donlad R. Askeland and Wendelin J. Wright, 7th edition, (Enhanced, Si Edition B- Recommended books, materials, and media: W. Callister and David G. Rethwisch “Materials Science and Engineering - SI Version” 9th edition

29. Additional information:

A set of problems for each topic will be assigned as homework. Solutions of these and other problems will be discussed in class.

Name of the Instructor or the Course Coordinator: ……	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: ……..……