Jordan University of Science and Technology

Faculty of Engineering

Biomedical Engineering Department

BME440 Introduction To Biomedical Materials

First Semester 2023-2024

Course Catalog
3 Credit Hours. 3 Credit hours (3 h lectures). Survey of materials intended for biological applications; Materials for both medical implants and dental restoration and appliances will be covered, Discussions of various aspects pertaining to the selection, processing, testing (in vitro and in vivo) and performance of biomedical materials, The biocompatibility and surgical applicability of metallic, polymeric, ceramic, and other implants and prosthetic devices are discussed.

Text Book	
Title	Biomaterials: An Introduction
Author(s)	Park J.,& Lakes R
Edition	2nd Edition
Short Name	Ref#1
Other Information	...

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	Mechanics of Materials	Beer F., Johnston E., & Dewolf J	3rd Edition	

Instructor	
Name	**Prof. Mohammed Almomani**
Office Location	M5L3 Tel 22539
Office Hours	
Email	maalmomani7@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue, Thu : 10:30 - 11:30
Room: LAB

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
283410	BME341 Biomechanics	Prerequisite / Study
912620	CHEM262 Biochemistry	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Introduction to Biomaterials, Bulk Properties of Materials	
Week 3	Surface Properties of materials	
Week 4	Metals	
Week 5	Polymers	
Week 6	Hydrogels	
Week 7	Ceramics, glasses, and glass-ceramics	
Week 8	Pyrolitic Carbon	
Week 9	Biological materials	
Weeks 10, 11	Host Reaction to biomaterials	
Weeks 12, 13	Testing Biomaterials	
Weeks 14, 15	Application of materials in medicine and dentistry	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Appreciate the role of biomaterials in biomedical engineering [1SO4, 1SO7]	15%	
Introduce bulk and surface material properties essential to the understanding of biomaterials design, and application [1SO1, 1SO3]	10%	
Analyze the different classes of materials used in biomedical applications and the characteristics of each class [1SO1, 1SO3, 1SO4]	20%	
Study the types of host reaction to biomaterials and biocompatibility [1SO1, 1SO2, 1SO3, 1SO4]	15%	
Consider the application of various biomaterial testing protocols for both in-vitro and in-vivo assessment [1SO1, 1SO2, 1SO3, 1SO4]	15%	

Correlate the properties of the different biomaterials to their applications in medicine and dentistry [1SO1, 1SO2]	15%	
Encourage life long learning, foster teamwork and enhance student's communication skills. [1SO3, 1SO4, 1SO5, 1SO6, 1SO7]	10%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
26.67	15	21.17	23.67	2	2	9.5

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