



Jordan University of Science and Technology
Faculty of Engineering
Biomedical Engineering Department

BME550 Biomems And Nanotechnology
Second Semester 2023-2024

Course Catalog
3 Credit Hours. Introduction to microfabrication technologies and microfluidic principles and their applications in biomedical microdevices design, fabrication, and packaging.
Teaching Method: On Campus

Text Book	
Title	BioMEMS and Biomedical Nanotechnology
Author(s)	Ferrari M
Edition	2nd Edition
Short Name	BMBN
Other Information	Springer Publications

Course References

Short name	Book name	Author(s)	Edition	Other Information
Madou	Fundamentals of Microfabrication: The Science of Miniaturization	MJ Madou	3rd Edition	
Wereley	Fundamentals And Applications Of Microfluidics	Nguyen N.T., Wereley S. T.	3rd Edition	

Instructor	
Name	Prof. Ruba Khnouf
Office Location	C5 L2
Office Hours	Sun : 11:30 - 13:30 Mon : 10:00 - 10:30 Tue : 11:30 - 13:30 Thu : 11:30 - 13:30

Email	rekhnouf@just.edu.jo
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Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 10:30 - 11:30 Room: G2123

Prerequisites		
Line Number	Course Name	Prerequisite Type
284400	BME440 Introduction To Biomedical Materials	Prerequisite / Study
283420	BME342 Bio Fluid Mechanics	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction	From BMBN , From Madou , From Wereley
Weeks 2, 3	Silicon Microfabrication	From Madou
Weeks 4, 5	Soft Microfabrication Techniques	From Madou
	Microfluidic Principles	From Wereley
Weeks 8, 9	Microfluidic Components	From Madou , From Wereley
Weeks 10, 11	Clinical Lab Tests	From BMBN
Weeks 13, 14	Micro Total Analysis Systems/ Lab on Chip	From BMBN

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Appreciate the role of miniaturization and microfabrication in engineering	10%	
Study the crystal structure of silicon and glass and the resulting properties of this structure	10%	
Study the mechanisms of silicon microfabrication including lithography methods, etching, methods, wet and dry bulk surface micromachining, electroplating and other thin film deposition techniques, and substrate bonding	20%	
Study soft fabrication methodologies including soft lithography, polymeric surface micromachining, micromolding, and 3D photopolymerization	20%	
Study microfluidic principles	30%	

Apply microfabrication and microfluidic principles on micrototal analysis systems and lab on chip device design	10%	
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Relationship to Program Student Outcomes (Out of 100%)																
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A	B	C	D	E	F	G	H	I	J	K	L	M	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7

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