BMEn 5151 - Intro to BioMEMS and Medical Microdevices
Spring 2025, Thursdays, 3:35 p.m. - 5:30 p.m., Two Credits, Prof. Steven S. Saliterman

Classes will be in MCB 2-120					
Week	**Date**	**Lecture**	**Topic**	**Literature Learning*** (Posted on website.)	**Projects**
1	1/23/2025	1st hr.	Course Introduction		
		2nd hr.	Silicon Microfabrication Part 1 - Lithography & Etching	Saliterman S., *Silicon Microfabrication* in Fundamentals of BioMEMS & Medical Microdevices, Ch 2.	
2	1/30/2025	1st hr.	Silicon Microfabrication Part 2 - Deposition & Wet Etching		
		2nd hr.	Polymer Microfabrication	Saliterman S., "Soft" Fabrication Techniques, Ch 3. Ermis, M et al. *Micro and Nanofabrication methods to control cell-substrate interactions and cell behavior: A review from the tissue engineering perspective.* 2018.	
3	2/6/2025	1st hr.	Organ-on-a-Chip	Zhang, B. et al. *Advances in Organ-on-a-Chip Engineering.* 2018.	
		2nd hr.	Microfluidics Part 1 - Design & Fabrication	Saliterman, S., Microfluidic Principles, Ch 5. Lake, M.A. *Microfluidic device design, fabrication, and testing protocols.* 2015. Hossan, MR. et al. Review: Electric driven pumping in microfluidic device. 2018.	
4	2/13/2025	1st hr	Microfluidics Part 2 - Basic Fluid Mechanics	Alam, M.K., Recent Advances in Microfluifidc Technology 2018. Zheng, W. et al. *Synthesizing Living Tissues with Microfluidics.* 2018.	
		2nd hr	Biosensors	Gailwad, P. et al. *Advances in Point-of-Care Diagnostic Devices in Cancers,* 2018. Vashist, S.K. *Immobilization of Antibodies and Enzymes...* Chem Rev. 2014. Wongkaew, N *Functional Nanomaterials and Nanostructures …* 2019.	
5	2/20/2025	1st hr.	Lab-on-a-Chip Part 1 - Cell & Molecule Manipulation	Xu-Dong, Z et al. *Advances in Microfluidics Applied to Single Cell Operation,* 2018.	Intro by TA & help forming groups
		2nd hr.	Lab-on-a-Chip Part 2 - Detection Methods	Zou, D. *Advances in Isolation and Detection of Circulating Tumor Cells Based on Microfluidics,* 2018.	
6	2/27/2025	1st hr	Jeopardy!		
		2nd hr	Continuation		
7	3/6/2025	3:35 - 5:00 pm	Midterm Examination - 3:35 to 4:50 pm (75 mins.) in our usual classroom. Closed book - no electronic devices permitted in room. DRC exam times must overlap.		
8	Spring Break	3/10-3/14			
9	3/20/2025	1st hr	Nanotransducers - Quantum Dots & Nanoparticles	Wongkaew, N et al. *Functional Nanomaterials and Nanostructures…,* 2019.	Project title & abstract due.
		2nd hr	Microsensors - MEMS	Rado, J. et al. *3D Force Sensors for Laparoscopic Surgery Tool* , 2016.	Team Time.
10	3/27/2025	1st hr	Drug Delivery	Coffel, J. *BioMEMS for Biosensors and Closed-Loop Drug Delivery,* 2018.	
		2nd hr	DNA & Protein µTAS	Sola, L. et al. *Array of multifunctional polymers for localized immobilization of biomolecules on microarray substrates,* 2018.	
11	4/3/2025	1st hr	Biocompatibility, FDA, ISO 10993	Chen, H. Biocompatible Polymer Materials: Role of Protein–Surface Interactions, 2008.	
		2nd hr	Intro to Clinical Laboratory Medicine	Saliterman S., Clinical Laboratory Medicine in Fundamentals of BioMEMS, Ch 8.	
12	4/10/2025	1st hr.	Guest Speaker - Alan Gonzalez- Suarex, PhD, Mayo Clinic		
		2nd hr.	Guest Speaker - TA		
			Team Meeting Time		Team Time
13	4/17/2025		Student Presentations		Projects Due
14	4/24/2025		Student Presentations		
15	5/1/2025		Student Presentations; SRT course evaluation - please bring computer.		
16			Standard Exam Schedule (75 mins.) in our usual classroom. Closed book - no electronic devices permitted in room. DRC exam times must overlap.		