

EE425 Bioengineering

Instructor:

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Course Description: The course covers basic concepts of biomedical engineering and their connection with the spectrum of human activity. It serves as an introduction to the fundamental science and engineering on which biomedical engineering is based.

Time & Location: Fall 2014 **Tuesday/Thursday 11:00am – 12:15pm**
Location: **ESB 251**

Office hours: Tuesday/Thursday 9:30am to 11:00am at ESB 715

Prerequisites: None

Course website: <http://ecampus.wvu.edu>

Textbooks:

- 1) Class notes and handouts,
- 2) Reading material will also be posted to course website or handed out in class
- 3) Recommended text book: W. Mark Saltzman, “Biomedical Engineering: Bridging Medicine and Technology” Cambridge University Press, 2009

Grading: Quiz 10%, Homework 20%, Midterm exam 25%, Final exam 35%, Lab section 10%, and the final grade will be computed using these five scores. Course grades will be assigned on a standard scale: 90, 80, 70, 60, etc. Quizzes will be announced earlier and given at the beginning of the lecture to assess understanding of the material covered in class. The lowest quiz grade will be dropped.

Attendance Policy: Attendance is strongly encouraged. Attendance may be recorded at random times throughout the semester. Lab section attendance is required and no make-up lab section is available. All students are responsible for all materials covered in class as well as all assignments made, due dates and any announcements. Consistent with WVU guidelines, students absent from regular scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time. Make-up exams for absences due to any other reason will not be given unless you have absence approved before the exams.

Social Justice Statement:

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Accessibility Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see <http://diversity.wvu.edu>.

Tentative Lecture Schedule: Any changes will be announced in the class.

		Lecture and Date	Topic	Chapter
Week 1	Introduction	1. Aug. 19, 2014	Class policy and Introduction to Bioengineering	1
		2. Aug. 21, 2014	Continue with Introduction to Bioengineering	
Week 2	Part 1 MOLECULAR AND CELLULAR PRINCIPLES	3. Aug. 26, 2014	Biomolecular Principles: DNA and protein 1	2, 3
		4. Aug. 28, 2014	Biomolecular Principles: DNA and protein 2	
Week 3		5. Sep. 2, 2014	Cell culture engineering 1	5
		6. Sep. 4, 2014	Cell culture engineering 2	
Week 4	Part 2 PHYSIOLOGICAL PRINCIPLES	7. Sep. 9, 2014	Cardiovascular Physiology 1	8
		8. Sep. 11, 2014	Cardiovascular Physiology 2	
Week 5		9. Sep. 16, 2014	Cardiovascular Physiology 3	9
		10. Sep. 18, 2014	Renal Physiology	
Week 6	11. Middle term review (Sep. 23, 2014) Middle Exam (Sep. 25, 2014)			
Week 7	Part 3 BIOMEDICAL ENGINEERING	12. Sep. 30, 2014	Bioimaging 1	12
		13. Oct. 2, 2014	Bioimaging 2	
Week 8		14. Oct. 7, 2014	Advanced biotechnology 1	11 class note, and handout
		15. Oct. 9, 2014	Advanced biotechnology 2	
Week 9	Oct. 14, 2014 Fall Break			
	16. Oct. 16, 2014	Advanced biotechnology 3		
Week 10		17. Oct. 21, 2014	Biosensor 1	
		18. Oct. 23, 2014	Biosensor 2	
Week 11		19. Oct. 28, 2014	Microchip Lab group 1&2	
		20. Oct. 30, 2014	Microchip Lab group 3&4	
Week 12		21. Nov. 4, 2014	Election Day (University Closed)	
		22. Nov. 6, 2014	Microchip Lab group 1&2	
Week 13		23. Nov. 11, 2014	Microchip Lab group 3&4	13
		24. Nov. 13, 2014	Drug Delivery 1	
Week 14		25. Nov. 18, 2014	Drug Delivery 2 and Tissue Engineering 1	13, 15
		26. Nov. 20, 2014	Tissue Engineering 2	
Thanksgiving Recess Nov. 24, 2014 – Nov. 28, 2014				
Week 16	Part 3 cont. BIOMEDICAL ENGINEERING	27. Dec. 2, 2014	Biomechanics	10
		28. Dec. 4, 2014	Final Review	
University Scheduled Final Exam: 8:00am to 10:00am @ 251 on Wednesday (Dec. 17, 2014)				

Note:

- 1) Two lab sessions (in MICRO-Chip Lab: ESB B26) for biomedical microdevices' fabrication and demonstration.