

BMED 2250 Problems in Biomedical Engineering (Required)

Catalog Description: BMED 2250 Problems- Biomedical Engr I (1-6-3)
Prerequisite(s): BMED 2210 (w.minimum grade of "C")
Biomedical engineering problems from industrial and clinical applications are addressed and solved in small groups using problem-based learning methodologies.

Textbook: None

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Topics Covered:

1. Team formation, peer- and self-evaluation of team work
2. Conducting literature reviews
3. Biomedical engineering statistics, sensitivity, selectivity, power
4. Experimental design to evaluate medical devices
5. Mathematical modeling as a tool for building understanding of complex biomedical engineering problems

Course outcomes:

Students who complete this course will be able to:

Outcome 1: Tackle a complex, real-world problem (Student Outcomes a, b, e, i, and j)

- 1.1 Define the problem and identify the problem goals
- 1.2 Explore the problem statement to identify critical problem features
- 1.3 Develop provisional models and hypotheses that frame problem-solving
- 1.4 Plan an attack strategy, carry it out, and evaluate the results

Outcome 2: Conduct self-directed inquiry (Student Outcome i)

- 2.1 Recognize inadequacies of existing knowledge, identify learning needs, set specific learning objective, and make a plan to address these objectives
- 2.2 Evaluate inquiry, assess reliability of sources, digest findings and communicate them effectively to self and others
- 2.3 Apply the newly acquired knowledge to the problem

Outcome 3: Demonstrate effective group skills (Student Outcome d)

- 3.1 Help group develop team skills, and willingly forego personal goals for group goals
- 3.2 Complete tasks on time, and avoid contributing excessive or irrelevant information
- 3.3 Express disappointment or disagreement directly, give emotional support to others, demonstrate enthusiasm and involvement
- 3.4 Monitor group progress, facilitate interaction with other members, and assess group skills of self and others

Outcome 4: Build knowledge in disciplines relevant to BME (Student Outcome a, e)

- 4.1 Digest finding and communicate them effectively to others
- 4.2 Identify deep principles for organizing knowledge
- 4.3 Construct an extensive knowledge base in all problem aspects

- 4.4 Ask probing questions to propel further analysis of problem
- Outcome 5: Communicate solutions of problems (Student Outcome g)
 - 5.1 Generate effective written reports
 - 5.2 Construct and present effective oral presentations

Correlation between course outcomes and student outcomes:

BMED 2250											
Course outcomes	Biomedical Engineering Student Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
1.1	X	X			X				X	X	
1.2	X	X			X				X	X	
1.3	X	X			X				X	X	
1.4	X	X			X				X	X	
2.1									X		
2.2									X		
2.3									X		
3.1				X							
3.2				X							
3.3				X							
3.4				X							
4.1	X				X						
4.2	X				X						
4.3	X				X						
4.4	X				X						
5.1							X				
5.2							X				

The Wallace H. Coulter Department of Biomedical Engineering Student Outcomes:

- a. an ability to apply knowledge of mathematics, science, and engineering;
- b. an ability to design and conduct experiments, as well as to analyze and interpret data;
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, societal, political, ethical, health and safety, manufacturability, and sustainability;
- d. an ability to function on multidisciplinary teams;
- e. an ability to identify, formulate, and solve engineering problems;
- f. an understanding of professional and ethical responsibility;
- g. an ability to communicate effectively;
- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- i. a recognition of the need for, and an ability to engage in lifelong learning;
- j. a knowledge of contemporary issues;
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;