BMED 3610 Quantitative Engineering Physiology Laboratory II (Required)

Catalog Description: BMED 3610 Quant Engr Physio Lab II (1-3-2)
Prerequisite(s): BMED 2310 and BMED 3310 and BMED 3110 and BMED 3600 (w/ concurrency)
This lab provides an active learning team environment, incorporating common cell/molecular biology techniques, to reinforce selected engineering principles in an in vitro cell culture setting.

Textbook: None

Prepared by: Essy Behravesh

Topics Covered:

1. In vitro cell culture
2. Microscopy and image analysis
3. Reading and analysis of peer-reviewed scientific literature
4. Reproduction of experimental results published in the literature
5. Use of techniques described in the literature to address a new scientific question
6. Design and execution of independent, open-ended hypothesis-driven projects

Course outcomes:

Students who complete this course will be able to:
Outcome 1: Conduct experiments as well as to measure, analyze, and interpret experiment data from cells and cellular structures (Student Outcome b)
Outcome 2: Understand homeostasis in cellular systems and be able to apply this information to bioreactor design problems (Student Outcomes a, e, and k)
Outcome 3: Understand the impact of the variability of biological systems at the cellular level on engineering design (Student Outcomes a, e)
Outcome 4: Address challenges associated with the interaction between cells and non-living materials and systems (Student Outcome b)
Outcome 5: Design and conduct an experimental design project, and present the results (Student Outcomes b, g, and k)

Correlation between course outcomes and student outcomes:

BMED 3610											
	Biomedical Engineering Student Outcomes										
Course outcomes	a	b	c	d	e	f	g	h	i	j	k
1		X									
2	X				X						X
3	X				X						
4		X									
5		X					X				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;