NJIT | DEPARTMENT OF BIOMEDICAL ENGINEERING

Department of Biomedical Engineering

Dr. Ghazaleh Khayat	**CLASS HOURS** **Monday: 11:30 - 12:55 pm** **Thursday: 10:00 - 12:55 pm** **4.5 hours/ week** **3 credits**	**OFFICE HOURS (Fenster 612)** **Thursday 1:00 pm**	Required Course **Prerequisites:** BME 111, BME 301, BME 302 and MATH 222 all with a C or better.

TEXT: Fundamentals of Human Physiology, 4th Edition. ©2012
Lauralee Sherwood - West Virginia University-ISBN-10: 0840062257. ISBN-13: 9780840062253
MATLAB programming with applications for Engineers, Stephen Chapman
Publisher: Cengage Learning. ISBN-10: 0495668079 ISBN-13: 9780495668077

COURSE DESCRIPTION: This course is intended for students to integrate their basic knowledge of physiology, biology, engineering, and math. Students should implement their analytical skills and develop their engineering talent when faced with complex and challenging situations in the biomedical field.

LEARNING OUTCOMES

By the end of the semester the student should be able to apply engineering tools and knowledge to decipher, understand and describe situations and problems originating in living systems.

COURSE OUTLINE

Week	Class Content
1	**Welcome/ Hardware Tutorial – Paper**
2	**Paper discussion**
3	**Introduction to Cardio-Pulmonary**
4	**Cardio-Pulmonary Lab**
5	**Introduction to Muscle and Fatigue**
6	**Muscle and Fatigue**
7	**Introduction to Pulmonary Airflow**
8	**Pulmonary Airflow**
	SPRING BREAK
9	**Introduction to Tadpole robot**
10	**Tadpole robot – I**
11	**Introduction to Muscle-nerve preparation**
12	**Muscle-nerve preparation**
13	**Tadpole robot-II(Mat & met)** **Muscle-nerve preparation presentation**
14	**Tadpole robot – II**
15	**Tadpole robot – Presentation & Closure**

Note: numerous quizzes will be given during the semester.

The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course outline and schedule.

BME 383: Course Learning Outcome

OUTCOME 6: **An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions**	
Outcome #6. 1. Students will learn to evaluate a proposed experiment and to evaluate critically experimental design	
Strategies & Actions	**Assessment Method**
During the introductory sessions, students will review the pertinent physiology. Students will reexamine the proposed task presented in lay terms, they will identify the problem redefine and restate the problem in engineering and scientific language as a Hypothesis. The students will develop and recommend a materials and methods section, with material provided on Moodle and self-acquired references, to find an answer to the identified problem.	Lab report. Class discussions. Quizzes
Outcome # 6.2. Students will learn to create and propose solutions, and to apply engineering and math to understand and solve problems.	
Strategies & Actions	**Assessment Method**
During the discussion sessions, the students will evaluate and criticize the adopted strategies used for sensing, recording, and analyzing data collected during previous laboratory. Students will discuss the different engineering tools and techniques used in each assignment. In their lab reports, as well as during the introductory and presentation/discussion sessions, students are encouraged to propose new techniques for performing the projected studies, and new means for achieving the desired results. Reports include graphs, engineering strategies and mathematical tools to establish relation between variables, and to draw meaningful conclusions.	Lab report. Class discussions. Quizzes