BIOE 340: Biomedical Engineering Principles
3 Credit Hours
Spring 2014

Instructor: Adam Higgins
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Grader: Julian Preciado (preciadj@onid.oregonstate.edu)

Office Hours: drop in or by appointment

Meeting time: TR 12:00-1:50, Withycombe 217

Prerequisites: CHE 332; Z 331; Z333

Revision date: 30 March 2014

Course Description
Application of engineering concepts (mass and energy conservation, thermodynamics, and transport phenomena) to cellular- and system-level human physiology; design considerations for biomedical interventions and devices.

Course Learning Outcomes:
The goals of this course are to integrate engineering concepts with human physiology and to investigate potential biomedical interventions. By the end of the course, students must demonstrate:

1. knowledge of contemporary issues in biomedical engineering.
2. general knowledge of and ability to apply physiology.
3. an ability to apply advanced mathematics, science, and engineering to solve problems at the interface of engineering and biology, including those associated with the interaction between living and nonliving materials and systems.
4. an ability to design experiments, make measurements on and interpret data from living systems.

Required Text: Quantitative Human Physiology, by Joseph Feher

Reference Texts:
Bioengineering Fundamentals, by Ann Saterbak, Larry V. McIntire and Ka-Yiu San
Respiratory Physiology, The Essentials, by John B. West
Introduction to Biomedical Engineering, by John D. Enderle and Joseph D. Bronzino
Physics of the Human Body, by Irving P. Herman
Pharmacokinetics and Pharmacodynamics of Biotech Drugs, by Bernd Meibohm

Course Grading: Letter option only (A-F).
Performance evaluation will be based on the following:

Homework	**20%**
5 assignments worth 4% each	
Physiology Lab Write up	**8%**
Modeling Assignment	**15%**
Open-ended modeling project	
Quizzes	**32%**
4 quizzes worth 8% each	
Participation	**5%**
Term Project: Design of Experiment	**10%**
Design and execution of an experiment investigating a physiological concept	
Term Project: Report on a Medical Intervention or Device	**10%**
Oral presentation on a medical device or intervention	

Final performance percentage will be assigned a letter grade by the following scale:

100-94	A	74-76	C
90-93	A-	70-73	C-
87-89	B+	67-69	D+
84-86	B	64-66	D
80-83	B-	60-63	D-
77-79	C+	60<	F

Course policy on attendance, late work, etc.

I will not accept any late homework and will not allow make-up class participation activities EXCEPT in the event of an emergency or illness. In the latter cases, you must notify me as soon as possible to discuss a time-line for making up the work. In most cases, you should be able to contact me before your absence (email is fine). It will be your responsibility to secure handouts and notes from the class periods you miss.

Academic honesty

I take academic honesty very seriously. Any instance in which a student is caught cheating will be handled in strict accordance with the policies outlined at http://www.orst.edu/admin/stucon/achon.htm. In order to provide students with a positive learning environment, OSU has adopted a pledge of civility, which can be found at http://osu.orst.edu/admin/stucon/index.htm.

Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- Cheating- use or attempted use of unauthorized materials, information or study aids
- Fabrication- falsification or invention of any information
- Assisting- helping another commit an act of academic dishonesty
- Tampering- altering or interfering with evaluation instruments and documents
- Plagiarism- representing the words or ideas of another person as one's own

Unless otherwise stated by the instructor, you are not allowed to look at previously worked solutions of assigned work (e.g., use of solutions manuals, homework, pre-labs, reports, presentations, etc.), even to check your work. Using worked solutions is considered academic dishonesty and may result in an "F" grade in the class. Assisting others to do this is also considered academically dishonesty.

Electronic sharing of individual assignments and reports is considering cheating. Copying and pasting without appropriate reference is considered cheating. Great caution should be used before sharing other types of files, e.g. spreadsheets, etc. If you are emailing another student, and there is an attachment, think before sending.

When evidence of academic dishonesty comes to the instructor's attention, the instructor will document the incident, permit the accused student to provide an explanation, advise the student of possible penalties, and take action. The instructor may impose any academic penalty up to and including an "F" grade in the course after consulting with school head and informing the student of the action taken.

Course Values Statement

I am dedicated to establishing an inclusive learning environment that values all students' experiences. Therefore, disrespectful and demeaning statements, attitudes, and behaviors based on age, ability, color/ethnicity/race, gender identity/expression, immigration status, marital/parental status, military/veteran's status, national origin, political affiliation, religious/spiritual beliefs, sex, sexual orientation, socioeconomic status will not be tolerated.

Statement Regarding Students with Disabilities

Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.