BIOE 320: Systems Physiology Laboratory

Spring 2023

Instructor

Dr. James Long
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BRC 765

Teaching Assistants

Monday	*Wednesday*	*Thursday*
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Office Hours

Office hours are scheduled on a by-appointment basis. Please email the instructor to schedule a time.

Course Website

The course website, which includes all necessary documents, is hosted on Github. You may access it through this link or the following: bit.ly/bioe320_s23. Assignment submission and grading will be hosted on Canvas.

Course Description

The primary objective of the laboratory course and selected assignments is to illustrate the physiological principles and processes that are described in BIOE 322, Systems Physiology. Using the BIOPAC software and various medical measurements tools, you will conduct physiological tests including ECG, EEG, EMG, blood pressure, pulmonary function, etc. with your partner(s).

Graded material includes: pre-lab assignments, in-class worksheets, and post-lab assignments. There will be no quizzes or tests in this class. The pre-lab questions and post-lab questions are available on the course website. It is your responsibility to download and complete these assignments *individually*. In-class assignments will be provided (one hard copy per group) at the beginning of the laboratory time.

Course Objectives

By the end of the course, students will demonstrate the ability to:

1. Conduct experiments with appropriate bioengineering techniques.
2. Analyze and interpret data from living systems, using principles of human physiology.
3. Design and execute a complete experiment.

Corequisite

Students must be concurrently enrolled in BIOE 322. No exceptions.

Safety

Laboratory environments include inherent dangers and thus strict compliance to safety measures is important. All students are expected to work safely and to ask for assistance when uncertain. Absolutely no eating, drinking or gum chewing will be allowed at any place or time in the lab. Penalties of varying severity may be applied for lab safety violations, including but not limited to: improper use of equipment, leaving the lab area messy, endangering self or other students, and eating/drinking during lab.

Grading Policy

This grading breakdown of the course is as follows:

Category	Submissions	Total Points	% Final Grade
Pre-Labs	Canvas	125	25%
In-Labs	In class	230	46%
Post-Labs	Canvas	120	24%
Lab Conduct	In class	25	5%

There is no curve in this course – what you see is you get! The earned letter grades will follow conventional numerical standards based on the cumulative percentage of assignment scores:

- A+: ≥ 97, A: ≥ 93, A–: ≥ 90
- B+: ≥ 87, B: ≥ 83, B–: ≥ 80
- C+: ≥ 77, C: ≥ 73, C–: ≥ 70
- D+: ≥ 67, D: ≥ 63, D–: ≥ 60, F: < 60

Late assignments will be penalized 30% of the assignment value per day it is late, rounded up. In other words, if you submit a pre-lab one minute late on Canvas, you will automatically receive 30% off the final grade. This penalty is intentionally steep - please turn in your assignments on time. If you believe that an error was made in grading your assignment, you should write a short justification of your claim and email it to the instructor. The "statute of limitations" for submitting such claims is one week after the assignment was returned. Note that the entire assignment will be re-graded, not just the section in question, in order to ensure consistency and fairness.

Students are required to attend all sessions of the laboratory. Exceptions for illness, family emergencies, or other excusable absences may be granted with instructor approval on a case-by-case basis. Any make-ups for valid absences must be done at the convenience of the instructor and your lab partner. Penalties will also be assessed for tardiness; the point deduction will scale with the severity of the infraction.

Honor Code Policy

Collaboration between group members is expected for the completion of high quality in-lab assignments. In contrast, you may not collaborate with other students, including those in your group, on pre-labs and post-labs. For these assignments, you are expected to turn in original work. Furthermore, for all assignments in this class, you may not consult the materials from previous years' BIOE 320 courses, including but not limited to: student assignments, reports, data calculations, and code. You may use academic sources, such as research papers, where appropriate, but you must cite these sources properly. Failure to cite work that is not your own is plagiarism and will be reported.

If you need clarification on any of these policies, please contact the instructor *prior to submission* to avoid an infraction. For a list of standard definitions as outlined by the Honor Council, please see this link.

Commitment to Equitable Learning

This class is committed to an equitable learning environment. Accommodations will be made for students with alternative needs, but it is critical that you alert the instructor in advance of any additional resources you need prior to assignment submission. For additional resources and more information, please visit the Disability Resource Center and the Access and Opportunity portal.

Schedule and Assignment List

For assignments submitted through Canvas, the time of the due date is **midnight of the day before your scheduled lab date** unless otherwise noted. Please see the Rice University Academic Calendar for other important administrative dates.

Date	Topic	Assignment	Submission	Points
N/A	Lab conduct		Class	25
Week of 01/09	Week 1: Intro to BIOPAC	In-lab	Class	25
		Post-lab	Canvas	15
Week of 01/16	Martin Luther King, Jr. Day			
Week of 01/23	Week 2: Electromyography (EMG) I	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
Week of 01/30	Week 3: Electromyography (EMG) II	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
Week of 02/06	Midterm recess			
Week of 02/13	Week 4: Electroencephalography (EEG)	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
Week of 02/20	Week 5: Electrocardiography (ECG) I	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
02/24	Drop deadline			
Week of 02/27	Week 6: Electrocardiography (ECG) II	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
Week of 03/06	Week 7: Blood Pressure (BP)	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
Week of 03/13	Spring recess			
Week of 03/20	Week 8: Pulmonary Function (PF)	Pre-lab	Canvas	15
		In-lab	Class	25
		Post-lab	Canvas	15
Week of 03/27	Beer Bike Week			
Week of 04/03	Week 9: Electrooculography (EOG)	Pre-lab	Canvas	20
		In-lab	Class	30
			Total points:	500