

## Summer 2021 BMED 3110 (NUIG) DRAFT

### Quantitative Engineering Physiology Laboratory I

Instructors: [Essy Behravesh](#)

**Pre-reqs:** BMED 3100, BMED 3400/BMED 3410, (BMED 2400 or CEE / ISYE 3770)\*, and CS 1371

\* statistics is a prerequisite with concurrency

#### What you will learn this semester

- Develop the ability to read and apply knowledge gained from scientific literature
- Design and conduct experiments involving biomedical sensors
- Develop the ability to quantitatively measure, statistically analyze, and interpret experimental data from living systems
- Develop the ability to address the challenges associated with the interaction between living systems and non-living materials and systems when designing and conducting experiments
- Complete a team-based experimental design project that will culminate in a poster presentation

#### Required Material

During the first week of classes you will be provided a kit for this course. Your kit will include an Arduino microcontroller board and sufficient components to allow you to construct two types of bio amplifiers.

You will also be provided with 50 Ag/AgCl electrodes for your use this semester. This is not an infinite supply. To get ready for the labs, download and install Arduino Software at <https://www.arduino.cc/en/Main/Software>

#### Communication and Appointments

This semester we are going to rely heavily on MS Teams. At the start of the semester, you should be able to access BMED 3110 course site. If you do not have access, use this MS Teams code: **XXXX**. We encourage you to turn on your video feed. It helps us get feedback from you and makes for a much healthier learning environment. You can contact us via this MS Teams interface by DM'ing or you may email anytime and include "[BMED 3110]" in the subject line. Please suggest an agenda if you'd like to meet by voice or video.

We will work hard to keep the course as asynchronous as possible. We will leverage video recording to communicate when timing is not critical. We do request that you make yourself available during the 'lab portion of the class. All meetings will be simulcast within MS Teams, and recorded whenever possible.

#### Grading

Your grade will be posted under the grades section of Canvas.

Assignment	Team / Individual	Points total
Team notebook (3 and 4)	Team	5/5
Skills Quizzes	Individual	10
Team peer review (pre-lab and poster session)	Individual	5/5
Pre-lab presentation (mod 3)	Team	10
Heart lab circuit or code	individual	5

<b>Heart lab analysis or report</b>	individual	5
<b>Journal club presentation</b>	Individual	10
<b>Build abstract and figure</b>	Team	5
<b>Final poster presentation</b>	Team	10
<b>Final report</b>	Team	15
<b>Teamwork in diverse groups reflection</b>	Individual/Team	10

Where a grade of A>=90., B>=80., C>=70., D>=60., and F<60

Rubrics are provided for each deliverable via Canvas. They are designed to be informative and will walk you through the requirements of the deliverables. Please use them!

### Expectations

This is a hands-on lab that is taught in-part away from the UAW lab space. We believe in hands-on learning and want you to have the best learning opportunity possible. Especially in our current environment, it is critical that you prepare and participate.

- We expect you to engage in asynchronously provided content.
- Be on time to meetings (Lectures, team meetings, troubleshooting sessions)
- Act with integrity and not cheat. If you cheat individually you will get a zero. If one person cheats in a team, I will send the case to OSI to adjudicate.
- Help us be better instructors. If we do a bad job of explaining something, let us know.
- Treat all of your classmates with kindness. There will be several peer-review assignments. You can provide constructive positive or negative feedback. Make sure it's constructive.
- If you show symptoms of COVID-19 stay home. Everything in this course can be done remotely (although not efficiently – troubleshooting is extremely difficult in a remote setting)
- We will attempt to deliver this course as remotely as possible. We are available to meet in-person and will meet in person when the situation requires us to do so.

### Planning

There are two main labs. The first is individual and will allow you to choose certain aspects of the lab. You will have to choose between circuits or coding and between statistical analysis and technical writing.

The second lab is more open ended team-based project that will begin with a pre-lab presentation. Before you begin your experiment, get feedback from me and your peers. These pre-lab presentations are designed to give you a great start on the module. Please take feedback seriously.

### Notebooks

You will receive specific instruction on how to organize and maintain this Notebook on the first day of lab. You are expected to keep an electronic log of your work for the individual first module. This is a practice notebook.

For the second module. Each **team** will maintain an electronic OneNote notebook. The team notebook must be organized, up-to-date in real-time, and reproducible. This

### Grading questions

Grading questions and concerns should be brought to my attention no later than one week after feedback on the graded assignment. Submit your grade dispute by emailing the original graded work along with an in-depth description of the dispute, and the entire assignment may be reevaluated at the end of the term. This may increase or decrease the overall score, and submission of a grade dispute does not guarantee that points will be awarded. Late disputes or disputes not prepared according to requested format will not be accepted.

### **Teamwork**

Teamwork is an essential part of this course, where most deliverables are team based. Deliverables require student teams to use their individual strengths to efficiently complete deliverables. Skill sets important for this course includes systems physiology, software programming, statistics, circuits and instrumentation, oral and written communication. It is not critical that you are highly skilled in all of these aspects, but a team that includes some level of proficiency in each will greatly improve your experience in this course.

A pre-lab team contract written by your team can ensure fair distribution of workload. Consequences of team contract violations should be written specifically in the pre-lab team contract but cannot have grade penalties and redistribution associated with them. I encourage you to have an open conversation with your assigned team and bring any team issues to me as soon as they occur. Do not wait too long thinking that your concerns will resolve on their own. You can add / revise your team contract any time with all team members consent. You always have the option to leave or be fired from your team, but I take this seriously and want you to have the best learning experience as possible.

### **Accommodations for Students with Disabilities**

*If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.*

### **Student-Faculty Expectations Agreement**

*At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body.*

*See <http://www.catalog.gatech.edu/rules/22> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, we encourage you to remain committed to the ideals of Georgia Tech while in this class.*

### **Statement of Intent for Inclusivity**

As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can engage actively in our learning community.

### **Honor Code**

*All written work in this course are team assignments, and you must work together with your team members to complete this work. You may also talk with anyone else enrolled in the course about specific questions; however, when writing, you may not work with students outside of your team. Plagiarism of*

*any form will not be tolerated as it is a violation of the GT Academic Honor Code. Unauthorized use of any previous semester coursework is prohibited in this course. Using these materials will be considered a direct violation of academic policy and will be dealt with according to the GT Academic Honor Code. Each violation of the honor code will result in a lower letter grade in your final score and will be reported to the Office of Student Integrity.*

**Agenda**

Assignment in canvas contains all course-related due dates. Use it! You can find specific information about each graded assignment within canvas including specific rubrics by which you will be graded.

	<b>Assignment</b>	<b>Date</b>
<b>Module 1:</b> heart lab	Circuits or coding	TBD
	Data analysis or writing	
<b>Module 2:</b> Journal club	Journal club presentation	
<b>Module 3:</b> Build	Pre-lab presentation / Peer review	
	Abstract and figure / team notebook	
<b>Module 4:</b> Final Project	Poster presentation / Peer review	
	Report / team notebook	
	Final reflection	
<b>Quizzes</b>	Technical writing	
	Circuits	
	Coding	
	Data analysis	