BMED 3110 Syllabus

Quantitative Engineering Physiology Laboratory I, Section A, 1-0-3-2

Fall 2026

Instructor Information

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General Course Information

Description

A hands-on lab providing an active learning team environment to reinforce selected engineering principles of physiology, emphasizing a quantitative model-oriented approach to physiological systems.

Course Learning Outcomes

- Develop the ability to read and apply knowledge gained from scientific literature selected based on your curiosity
- As a team, generate an original idea that can be tested on human participants by connecting insights gained from reading scientific literature.
- Design experiments that address the original idea in a human participant study
- Develop sensors and instrumentation that allows design of experiment to address objectives of an original idea
- Statistically analyze, and interpret experimental data from human participants to inform further work
- Address the challenges associated with the interaction between living systems and non-living materials and systems when designing and conducting experiments
- Communicate the value of an original team-based experimental design project through oral and written communication.
- Recognize the value of learning from a diverse team of peers

Required Course Materials

Your team will need to check out a hardware kit from the library. If you damage or fail to return the kit, you will be charged $50. You will also need to provide a USB-C cord to connect the kit to the computer.

To get ready for the labs, download and install Arduino Software at: https://www.arduino.cc/en/Main/Software.

If you are using a Mac and find yourself unable to detect the Arduino serial (USB) port, you likely need to install CH340 drivers: https://learn.sparkfun.com/tutorials/how-to-install-ch340-drivers/all

Make sure to install UNO R4 drivers and have a working copy matlab 2023 or earlier.

Grading Policy

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

Assignment	Team / Individual	Points
Module 1: Warm-up lab data upload	Individual	5
Module 1: Warm-up lab HRV abstract and figure	Team	5
Module 2: Journal club presentation	Individual	5
Module 3: pre-lab proposal presentation	Team	5
Module 3: pre-lab proposal	Team	10
Module 4: Final poster presentation	Team	5
Module 4: Final report	Team	25
Async lecture quizzes	Individual	5
Participation and attendance	Individual	10
Peer review and reflection (journal club, pre-lab, poster presentation, and final reflection)	Individual	10
Team notebook (checkpoints, increasing amounts) (1, 2, 5, 7)	Team	15
Total Points		**100**

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!

Description of Graded Components

Lectures

To supplement in person lectures, a variety of content will be available via asynchronous lecture. The lectures are intended to be concise discussions of narrowly defined topics. Several of these lectures will be mandatory, and you will have to choose from several more. Your knowledge of these will be quizzed in class. You will be notified of any required lecture material before the relevant quiz dates.

Notebooks

Team notebooks are a way to help you keep organized. Each **team** will maintain an electronic notebook within MS teams**. Notebook checks occur randomly.** Your team notebook must be organized, up-to-date, and reproducible. There will be a final notebook check after the poster session.

Grading questions

Late Assignments turned in past their due date will be graded with a penalty for the assignment. Assignments turned in one day past the due date will be graded at 75 percent of the overall grade, 50 percent for the second day. Any assignments turned in two days past the due date will be given a zero. Teams may request extensions on some assignments by obtaining written approval from a TA or the instructors.

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.

Peer Discussion
You are encouraged to pose general questions to and start conversations with the BMED 3110 community as a whole through our MS Teams site. The discussion should be used for things such as help understanding particular concepts, finding/using functions in MATLAB or modules in Python, and constructive feedback for presentations and the like. If you are having a problem, it is likely that someone else has the same issue.

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 include systems physiology, software programming, statistics, circuits and instrumentation, oral and written communication. It is not critical that you are highly skilled in all these aspects, but a team that includes some level of proficiency in each will improve your experience in this course.

At the beginning of the semester, you will self-select teams, in part based on skill sets. We encourage you to take the time to get to know each other early and often. Find out strengths and work styles. We believe that this time spent will pay dividends by the end of the semester. We encourage you to have open conversations with your team, particularly when issues arise. We are happy to serve as non-judgmental mediators – we are skilled in that! Do not wait too long hoping your concerns will resolve themselves on their own. You can include a team contract and modify it any time with all team members' consent. You always have the option to leave or be fired from your team, but we take this seriously and want you to have the best learning experience possible.

Course Policies

Attendance and/or Participation

As part of your participation grade, you can have up to three missed absences from lab. Coming later than 15 minutes to lab will be considered an absence. It is your responsibility to make up any work in a timely manner. Each additional 'absence' will reduce your participation grade by 2 points.

Academic Integrity

All written work on this course is team based, 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 or other tools like large language models (LLMs). Plagiarism of any form will not be tolerated as it is a violation of the GT Academic Honor Code. We will run your report through a ChatGPT/LLM checker. We want you to learn to write technical communication; we do not want to read AI generated text, data, or figures, which will be considered plagiarism. 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 be immediately and without question reported to the Office of Student Integrity and will result in a minimum of a lower letter grade or a zero, whichever is higher. For team-based assignments, your team will be referred to the Office of Integrity.

Core IMPACTS

n/a

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 us as soon as possible with details of how we can better serve you and 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 expectations 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.

In addition, 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 provided content.
- Be on time to meetings (Lab, 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, we 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 any illness stay home. You or your team, for team-based assignments, can request an extension up to 24 hours before the due date. Requests for extensions beyond 72 hours will only be considered under special circumstances.
- During the semester, it is possible that you have a major disruption in your life. We do not need to know the details but know that we are willing to work with you. We do, however, expect you to communicate with us by email or in person as soon as possible so that we can put a good working plan in place.

Pre- &/or Co-Requisites

BMED 3100, (BMED 2400 or CEE / ISYE 3770)*, and (CS 1371 or CS 1301)

*statistics is a prerequisite with concurrency -- see Teams section of syllabus for implications

Extra Credit Opportunities

n/a

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

For assignments that are not whole class, you have to ask for an extension at least 12 hours before the due date. No extensions or late assignments will be accepted otherwise.

Campus Resources for Students

Student Well-Being

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)

Agenda

The Assignments tab in canvas contains all course-related due dates. You can find specific information about each graded assignment within Canvas including grading rubrics. Pay special attention to the team notebook checkpoints on Canvas — for readability and concision, they are not listed below.

Module	**Lab**
Team Formation	Lab expectations and team formation
Module 1: Warm-Up Lab	**Deliverable: Modified ChatGPT Protocol for ECG characterization** Test ECG Circuit
	Collect and upload ECG Data (run Modified ChatGPT Protocol)
	Deliverable: Heart Rate Variability (HRV) Figure (Module 1 completion)
Module 2: Journal Club (JC)	Select and digest Journal Club articles
	Work on JC presentation, In-class peer feedback
	Deliverable: Journal Club Presentations & Peer reviews (in class) (Module 2 completion)
	Human Subjects/Compliance Quiz
Module 3: Formal-Lab Proposal	Formative feedback on proposal
	Deliverable: Pre-Lab Proposal Presentations and peer reviews
	Deliverable: Pre-Lab Proposal
Module 4: Formal Lab Project Realization	Open Lab
	Poster presentation Tuesday in class
	Report & Reflection