ME 3058 Systems Laboratory Syllabus

Instructor Info

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Course Info

- Prereq: ME3057, MATH2552, ME3322, ME3344
- Wednesdays & Fridays
- 11:00AM – 12:15PM
- Van Leer C241

Lab Info

- MRDC 3330
- Section A01: Tuesday 8:00AM – 12:15PM
- Section A02: Wednesday 12:30PM – 4:45PM

TA Info

- TBD

OBJECTIVE

Study the theory and techniques of experimental investigation to model and characterize complex multi-disciplinary systems, including the use of transducers, data acquisition, signal processing, statistics, and uncertainty analysis. Emphasis placed on exploring discrepancies between experimental results and theoretical models, and conveying results/conclusions through written communication.

MATERIALS/RESOURCES

The authoritative source for course materials and announcements is the class Canvas website (canvas.gatech.edu). All course materials and text will be provided via Canvas. No other materials are required or need to be purchased.

The course will require the use of:

- MathWorks Matlab (https://software.oit.gatech.edu/)
- Microsoft Teams and Office 365 (https://office365.gatech.edu)
- Piazza (access via Canvas)
- Perusall (access via Canvas)

The schedule is provided as a separate document and is subject to change.

TOPICS COVERED

- Experimental investigation of complex systems including mechanical, electrical, thermal, and fluid elements with emphasis placed on explaining discrepancies between experimental results and theoretical models
- Investigation of simple control systems and effects on system behavior
- Work-energy and frequency-based approaches to system identification
- Experimental statistics (regression, uncertainty, and error propagation)
- Drawing and conveying experimental conclusions through written communication structured around a logical narrative and supported by experimental evidence
- Principles and standard practice of written and graphical reporting
- Teaming, planning, and collaboration
- Specific theoretical topics include: Blackbody Radiation, System Identification, Controls, Mechanical Dynamics, Internal Combustion Engine, Fluid Pressure and Flow, Refrigeration Cycle, Thermodynamics, Heat Transfer

GRADING SCHEME

Item/Category	Type	Weight
Participation	Individual	10%
Peer Evaluations (Total)	Individual	6%
Homework and Outlines (Total)	Individual	18%
Blackbody Radiation Report	Group	14%
System ID / Controls Report	Group	16%
IC Engine Report	Group	18%
Refrigeration Report	Group	18%
Total		**100%**

Grade Scale: A = 90-100; B = 80-90; C = 70-80; D = 60-70; F <60

FAQs

I'm sick, what do I do?

Don't come to lab or lecture if you are sick! If you will miss a lab section, notify your section TA and the Head TA to make arrangements. This may be to join the lab virtually (via MS Teams) or to reschedule for a later lab section. Visit a doctor and get a doctor's note to provide to the Dean of Students Office, who will provide a verification that will allow us to provide credit for the missed lab. If you will miss a lecture, reach out to the primary instructor to get access to a recording (if available).

Can I reschedule my lab for an academic conference or job interview?

This is handled on a case-by-case basis. For an academic conference, please have your advisor send an e-mail to the primary instructor requesting your absence. For a job inter- view, do your best to ask to reschedule the interview for a non-conflicting time. If they are unable to reschedule, provide evidence to the Head TA when requesting a new lab time. Requests to reschedule should be made as soon as is possible.

I have a question, who and where should I go to ask?

If the question is general (like seeking help with homework) ask on Piazza first. If the question is related to your collected data, analysis, or communications reach out to your section TA (via MS Teams). If the question is about logistics of the course, reach out to either your section TA or the Head TA.

GRADING QUESTIONS

For grading questions, TAs and Instructors typically provide guidance on how to improve a deliverable, **but rarely adjust grades**. The goal of a deliverable is to be as clear as possible. Even if data/analysis is present, a lower grade may reflect a lack of clarity when reading the report. **Outside considerations (ex. "I really need an A to keep my scholarship") are not valid reasons to ask for a grade increase**. Grading issues will only be heard within two (2) weeks of return of the assignment.

QUESTIONS

Students with questions outside of lecture, whether about course content, grading, or administration, **should first contact their section TA**. If an issue remains unresolved, students should **next contact the Head TA**. The Course Instructor(s) should only be contacted after these sources have been exhausted. Students can set up office-hour meetings with section TAs, Head TA, or the instructor(s) by appointment, following the above contact chain. We highly recommend that you ask lab-related questions during the lab period. This allows TAs to use lab equipment for context in providing answers.

ACADEMIC INTEGRITY

Academic dishonesty includes, but is not limited to, the inappropriate use of information that a student may obtain while preparing an assignment for submission. This can include any of the following:

- Directly copying or plagiarism of the work–text, computer code, or displays–of others (including computer 'AI' generated) and submitting it without acknowledgment
- Sharing work–text, computer code, or displays–with other students currently enrolled in the class
- Distributing submitted work and/or graded work to print or electronic repositories which enable others to copy and submit that work

There will be **ZERO** tolerance for academic dishonesty. Students are strongly advised to refer to the honor code at http://www.honor.gatech.edu.

DIVERSITY AND INCLUSIVITY

Lectures and labs are places where you will be treated with respect, welcoming of individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All members of this course are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the course or instructional staff.

ACCOMMODATION FOR STUDENTS WITH DISABILITIES

Work is being done to increase the accessibility of all materials in the course. If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (https://disabilityservices.gatech.edu/) to discuss your special needs and to obtain an accommodations letter. Please also contact the primary instructor if you wish to discuss your accommodation needs.

GROUP WORK

Group are assigned by the section TA and will vary through the semester. If you experience undue difficulty with team members, notify your section TA **well in advance of a deliverable due date**. Poor group dynamics can result in requiring individual reports from certain members, the entire team, or elevation of the issue beyond course leadership. Individuals who fail to contribute to the lab work, to the post-lab analysis, or to the deliverables may be penalized, and in some circumstances may receive a zero for an assignment to which they failed to contribute. Do your part!!

PEER EVALUATIONS

Each group member is required to submit a Peer Evaluation for each group report. These are typically due 24-48 hours after the associated assignment. They should sufficiently convey the contribution of each team member in all aspects of the lab and report preparation in a paragraph. Peer evaluations are graded according to the quality of the evaluation provided for each team member.

The contents of peer evaluations written about a student are referenced when determining the student's participation grade and may be used for grade arbitration and/or to justify a reduced assignment grade for a student who has failed to contribute sufficiently to the group's work. **A student who consistently receives poor peer evaluation scores/participation may be asked to complete lab deliverables individually.**

ASSIGNMENT PREPARATION AND SUBMISSION

All deliverables (reports, outlines, homework, etc.) must be typed and turned in via Canvas as PDF files. **Figures must be produced using Matlab**. Neither hand-written submissions nor Excel figures will be accepted.

Matlab code and data must be submitted as a .zip file **separate** from the PDF file (2 files per assignment submission). Data sets should be submitted as a .mat file and scripts/functions as .m files (within the zip) which can be executed directly to display your results/figures. Include a "readme.txt" if guidance is needed to know which files to execute. Do not include Matlab code or data sets in the submitted PDF for deliverables.

Late reports will not be accepted, unless approved in advance or upon notice from the Dean of Students.

Lab reports are group assignments, though each group member must submit the report separately via Canvas with the completed honor code agreement as a cover page. Homework assignments (including Outlines) are individual assignments.

LAB POLICY

Arrive at least 5 minutes early for scheduled lab sessions. It is required that the lab guidance documents be read before the scheduled lab period. Teaching Assistants will always be in the laboratory during lab sections to help answer questions.

Long pants and closed toe shoes will always be required when in the laboratory. Further safety rules will be communicated in lab or by Canvas announcement.

ATTENDANCE POLICY

Attendance and participation are mandatory for all labs during the officially scheduled period. Lab deliverables will not be accepted without participation in the lab. **Attendance is also mandatory for all workshops which are scheduled during the lecture periods (see course schedule)**.

Requests to reschedule lab sessions due to official institute excused absences must be arranged with the Head TA **at least one week in advance of the absence. Rescheduling will require notification/verification from the Office of the Registrar**.

Students who miss a lab due to illness or family emergency must arrange to reschedule with the Head TA. **Notice must be given as soon as is possible. Verification from the Office of the Dean of Students will be required to get credit**. The same applies if an assignment extension is needed. Do not send doctors notes to Instructors/TAs, these should be provided to the Dean of Students Office.

If you know that you will be missing a class or lab date for a religious observance, you must clear the date in question with the professor during the first week of classes.

The Georgia Tech course attendance policy and process for requesting excused absences may be found here: https://studentlife.gatech.edu/resources/class-attendance

COMMUNICATIONS POLICY

Students are responsible for all announcements/communications sent via Canvas, MS Teams, or E-Mail. It is strongly recommended to keep notifications enabled for both Canvas Announcements and MS Teams Channel Mentions.