AE 2610 Syllabus

Introduction to Experimental Methods in Aerospace
Fall 2026

Instructor Information

Instructor	**Email**
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Description

Introduction to laboratory instrumentation and measurement techniques used in aerospace. Basic application of sensor principles, uncertainty analysis, interpretation and analysis of experimental data, and documentation.

Course Learning Outcomes

The objectives of this course are to:

1) expose students to laboratory instrumentation and experimental measurement techniques commonly utilized in aerospace engineering;
2) introduce students to fundamental principles governing common sensors, transducers and actuators, and modes of operation;
3) provides students with experience in the basic application of digital data acquisition, uncertainty analysis, and experimental data analysis and interpretation;
4) exposure students to basic concepts in aerodynamics, deformable bodies, and system dynamics through experiments.

Upon successful completion of this course, students should have a basic ability to:

1) apply experimental uncertainty analysis (confidence levels, error estimation);
2) document test conditions/procedures;
3) analyze and graph data;
4) effectively use digital data acquisition approaches;
5) use and understand the operation of basic sensors, transducers, and actuators;
6) apply critical reasoning and strategic thinking to experimental problems;
7) work in teams to execute and document an experiment;
8) understand and apply principles of laboratory safety.

Required Course Materials

You are not required to purchase any materials for this course. Online lab manuals will be provided through a link on the course website.

Grading Policy

Attendance: Lecture attendance represents 10% of your overall course grade

Laboratory reports: Each laboratory requires you to complete an experiment and produce a report. The format and grading details for the lab reports are provided on the course website. You must attend the lab and participate in the experiment to be able to submit the lab report. Note that, due to the nature of experimentation, some facilities may not be available or properly functioning. In such situations, the instructor may choose to omit or change a lab. The relative weight of the labs will remain the same in the event of such a change.

- Tensile testing laboratory: 20%
- Aerodynamic loads laboratory: 30%
- Dynamics laboratory: 20%
- Digital sampling laboratory: 20%

Your final course grade will be calculated based on the average of the graded components described above. The expected correspondence between numerical average and letter grade is:

- $\text{Grade} \geq 90\% = \text{A}$
- $90\% > \text{Grade} \geq 80\% = \text{B}$
- $80\% > \text{Grade} \geq 70\% = \text{C}$
- $70\% > \text{Grade} \geq 60\% = \text{D}$
- 60% > Grade = F

Description of Graded Components

You will participate in four labs. Each lab involves one **lecture**, a **lab experiment,** and a **lab report**. **Attendance** at the physical lab lectures is **mandatory**. If you missed the physical lab, you receive zero for that lab unless you have an excused absence, in which case we will arrange for you to make up the lab.

You will be required to maintain a laboratory notebook that documents your procedures, observations, and analysis. Your lab notebook is worth 15% of each lab's grade.

Two different types of written reports will be required for this course: data reports and formal reports. The type will be specified for each laboratory experiment.

1) The purpose of a formal report is to explain to your peers who are not familiar with the specific experiment, why you did it, how you did it, what you found and what the results mean. The audience for the formal report is junior- and senior-level students who have not taken AE 2610.
2) The purpose of a data report is to provide quick access to results with a minimum of delay. To this end, the results are presented but the details of the experiment and an extended interpretation of the data are omitted. Thus, the reader of the data report is assumed to be familiar with the particular experiment in question. Data reports

not just data "dumps", it is still important to effectively communicate your results. The focus is on PRECISE and CONCISE way of doing this.

Details on the format, content, and expectations for the reports is provided on the course's website.

Attendance and/or Participation

Attendance at lectures contributes to your final grade. Attendance will be recorded at each lecture. Unexcused absence from a lecture will result in receiving a grade of zero for that lecture's attendance. Excused absences will result in that lecture not being considered in your attendance grade.

Attendance at your assigned laboratory section is mandatory. You cannot receive a grade for the lab (including the lab notebook and lab report) if you do not attend your lab. If you cannot attend a particular lab for a reason that is approved by the Institute, reach out to the instructor as soon as possible to make other arrangements. This may involve joining another section or conducting the lab individually with the help of a TA. Under no circumstances will a lab be removed from consideration in your final grade; we will do our best to work with you to enable completion the lab in the event of an unavoidable absence.

Further useful information regarding Institute Approved Absences is available at: https://registrar.gatech.edu/faculty-and-staff/institute-approved-absences.

Further information regarding absence due to illness or emergencies is available at: https://catalog.gatech.edu/policies/student-absence-regulations/.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

In this course, the use of AI tools is permitted and encouraged as a means to enhance your work and improve efficiency. However, any work you submit must be your own, with any AI assistance appropriately cited. Direct replication of AI-generated content without meaningful modification or the use of AI to generate original content is not acceptable. All intellectual content must originate with you and be executed by you.

To ensure transparency and uphold academic integrity, you are required to document all AI prompts and corresponding AI-generated outputs. This documentation should be included within your submission. If no such documentation is provided, it will be assumed that no AI tools were utilized, and the work is entirely your own.

If it is later determined that AI or any other uncited sources were used without proper disclosure, this will be considered an infraction of the Georgia Tech Honor Code subject to investigation by the Office of Student Integrity.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) 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. The Student-Faculty Expectations articulate 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, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Other Important Information

The logistics, operations, and policies of this lab course are somewhat more complicated than for a conventional laboratory course. Detailed information on the operations of the labs, expectations, and other course policies are provided through the course's Canvas site. Students are responsible for familiarizing themselves with this material prior to the first lab.