AE 4312 Syllabus

Aircraft Design II: Preliminary Design, 3 Undergraduate Credits

Fall 2026

Instructor Information

Instructors:

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General Course Information

Description

This course is an extension of AE 4311: Conceptual Design. Students will form into teams, select a project, and work on designing a fixed wing aircraft to complete a given mission. The design projects will be selected from either a civilian or a military vehicle and will be substantially more complex than from the first semester course. Student teams are expected to develop their own schedules and work plans based on the knowledge and experience gained from the first semester course. The teams will meet with the instructors regularly to provide updates, have an opportunity to ask questions, and ensure sufficient progress is being made toward completion of the design.

Course Learning Outcomes

Upon completion of this course, the student should be able to:

- Effectively communicate technical information in both oral and written formats
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments
- Conduct system sizing analyses and trade studies
- Understand the major aircraft subsystems and their impact on the overall system
- Work effectively in a team environment

Required Course Materials

Course Text

Required Text: Roskam, Jan, *Airplane Design Parts I-VII*, DARcorporation, Third Printing, 2003;

Parts I, II, IV, and V are mandatory; others are recommended

Course Website and Other Classroom Management Tools

Course materials will be posted online to Canvas (https://canvas.gatech.edu/). Important communications to the class will be sent through the Canvas system; please be alert to these messages. Students will be held responsible for any message or announcement that has been posted to the class for more than 24 hours.

Grading Policy:

Assignment	Date	Weight (Percentage, points, etc.)
Design Report	End of semester	35%
Presentation	Mid-point of semester	25%
Weekly Meeting Participation	Throughout semester	20%
Peer Review	Mid-point and end of semester	10% (split between two reviews)

This class does not have a final exam.

Grading Scale

At Your final grade will be assigned as a letter grade according to the following scale:

A 90-100%
B 80-89%
C 70-79%
D 60-69%
F 0-59%

Full credit is awarded for solutions that are correct and demonstrate an understanding of the concepts of the problem. Partial credit is given for solutions that, while incorrect, demonstrate some knowledge of the concepts. Final grades may be curved based on overall class performance.

Description of Graded Components

Design Report: The design report will cover the requirements, configuration selection and vehicle sizing. plus the major aircraft disciplines including aerodynamics, propulsion, structure, stability, and weight & balance.

Design Presentation: One major design presentation in preparation for the final design report. The presentation should cover the current state of the design and the path to completing the design by the end of the semester.

Weekly Meeting Participation: The student design teams meet with the professor(s) on a weekly basis to provide status updates and ask for assistance on any potential issues with the design. It is expected that each student will have some small updates for each week.

Peer Review: Two major peer review at the midpoint and end of semester. The students will judge their team members contributions to the project, participation in the team and ability to work well within the team.

Course Policies

Attendance and/or Participation

Classroom attendance, either in person or remotely, is strongly encouraged but not required. Active participation is essential for understanding major concepts and contributing to the learning of others.

Absences related to personal illness or emergency, or career development (e.g. presenting a paper at a conference or scheduled job interview) are considered excused. Please contact the instructor as soon as you know of a schedule conflict if this applies to you. Please see the Institute Absence Policy - https://catalog.gatech.edu/rules/4/ for more information.

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.

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.

Pre- &/or Co-Requisites

It is expected that all students will have previously taken AE 4311 to be able to meaningfully contribute to their team

Collaboration, Group Work, and Use of Generative AI

Discussions with other students about how to solve problems are allowed and encouraged; however, all work turned in must be the student's own original work.

The use of outside references (e.g. textbooks) is expected and encouraged; when appropriate cite any referenced material that is used.

Generative AI can be used as a spelling/grammatical check and for general research. All AI results must be checked to ensure that no hallucinated data or sources is included in the design. Use of AI must be disclosed along with the honor code statement on all assignments.

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

All assignments are due at the designated time using online submission on Canvas. Any assignment turned in after collection is late. Late assignments may be turned in during the advertised grace period (usually 48 hours) for half credit. Any assignments turned in after this is not counted.

Excused absences (see above) may be a justification to receive an extension on an assignment. Please contact the instructor as soon as you know of a schedule conflict if this applies to you. Under special circumstances and at least two weeks of advance coordination with the professor, labs may be rescheduled for an individual. Labs missed due to illness or other emergencies can be made up, but must be supported by appropriate documentation coordinated through the Dean of Students. The professor reserves the right to grant special dispensations when deemed appropriate.

Inclement Weather and Digital Learning Days

In the event of inclement weather the weekly meetings will shift to an online format. An announcement will be made on Canvas if this occurs.

Campus Resources for Students

Undergraduate Student Academic Success Resources:

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

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)