# AE 4311 Syllabus

Aircraft Design I: Conceptual Design, 3 Undergraduate Credits

Fall 2026

## Instructor Information

**Instructors:**

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Dr. Neil Weston, (Email: neil.weston@ae.gatech.edu)

## General Course Information

**Description**

This course teaches students to perform the initial design work on a fixed wing aircraft. This includes examining requirements, determining a configuration, sizing the vehicle to meet a given set of requirements, and analyzing the various components of the vehicle and how those interact with each other. Students will have the option to select from a set of requirements for a civilian or military vehicle. Work will completed on an individual basis, with assignments being due in report format typically on a weekly basis, and each assignment building up the design to a level appropriate for more detailed design work.

**Course Learning Outcomes**

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

- Write and understand detailed aerospace system requirements
- Effectively communicate technical information in both oral and written formats
- Understand systems engineering concepts and terminology
- 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
- Understand aircraft configurations and layout
- Conduct system sizing analyses and trade studies
- Understand the major contributing factors to aircraft cost throughout the vehicle life cycle

**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.) |
|---|---|---|
| **Lab/Homework Assignments** | 11 total assignments due roughly every week | 70% (approximately 6.36% per assignment) |
| **Final Report (cumulative)** | End of classes | 30% |

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**

*Lab/Homework Assignments*: Consists of approximately weekly lab assignments which are due throughout the semester. Each assignment will be based on a worked lab using subject material covered in class that week. The required lab portion is instructional in nature, is individually completed, and is meant to be completed in one week. Completed lab assignments will be

submitted via Canvas. Use proper units when appropriate. Deductions will be made for improper report writing format.

*Final Report*: The final report consists of the accumulated material from the first eight assignments, all of which are based on designing a single vehicle. The report provides an opportunity for the student to fix errors or issues with their previous work, including both technical decisions and format/grammar issues. Completed reports will be submitted via Canvas. Use proper units when appropriate. Deductions will be made for improper report writing format.

## 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**

AE 3330: Vehicle Performance is Pre-requisite for the course.

**Collaboration, Group Work, and Use of Generative AI**

Discussions with other students about how to solve homework 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.

Use of homework solutions from prior semesters (if/when applicable) is not allowed.

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 lecture/lab 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)