

AE 3330 Syllabus

Vehicle Performance, 3 Undergraduate Credits

Summer 2026

Instructor Information

Instructors:

Mr. Carl Johnson, (Email: cj124@mail.gatech.edu)

General Course Information

Description

This course teaches students to perform performance analysis for the full range of aerospace vehicles, including fixed wing, rotary wing and spacecraft. The fixed wing performance calculations will include takeoff, climb, cruise, loiter and landing performance as a function of aerodynamic and propulsion characteristics. The rotary wing performance will include an understanding of actuator disk theory and include unique rotary wing performance segments like hover. The spacecraft performance will include orbital mechanics, orbit determination, orbital maneuvers and simplified launch vehicle performance.

Course Learning Outcomes

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

- Understand aerospace missions and the connection between various segments
- Be capable of analyzing all mission segments involved in each type of aerospace system
- Understand actuator disk theory and its application to propellers and rotors
- Develop some feel for representative numbers for both the inputs to a performance problem and the final output values to build some engineering intuition

Required Course Materials

Course Text

None. All required material will be presented in lecture material.

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.)
Homework	Approximately weekly	35%
Exam I (fixed wing and rotorcraft)	~6 weeks into semester	20%
Exam II (spacecraft)	~10 weeks into semester	20%
Final Exam	End of classes	25%

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

Homework Assignments: The homework assignments will require students to apply concepts from the lecture material. They will be based on representative aerospace problems with some conceptual questions and some numerical problems. Many problems will involve examining a range of parameter values to help students understand how they impact performance

Exams: The exams will include a mix of conceptual and numerical problems that can be completed with nothing but a calculator and an equation sheet. They will be similar to homework problems, but without any trade studies that would require more computational effort than is reasonable with just a calculator.

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.

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 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](#) [\(gatech.edu\)](#))