

AE 6503 Syllabus

Helicopter Stability and Control AE6503, Section A, 3 Credits
Fall 2026

Instructor Information

Instructor: J. Prasad

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General Course Information

Description

Helicopter general equations of motion, rotor forces and moments, helicopter stability and control characteristics, handling qualities, flight control system design.

Course Learning Outcomes

Students will be able to:

- Understand various helicopter rotor configurations and their control arrangements.
- Formulate and analyze articulated rigid blade dynamic equations
- Formulate and analyze rotor inflow dynamic equations
- Formulate and analyze rotor aerodynamic forces and moments
- Formulate and simulate helicopter flight dynamic equations
- Carry out helicopter simplified trim analysis
- Analyze helicopter static and dynamic stability and control characteristics
- Understand existing helicopter flight control designs and the impact of coupling between rotor and vehicle dynamics on helicopter flight control design
- Develop an understanding of helicopter flying qualities requirements
- Develop an understanding of rotating frame sampling in the analysis of helicopter flight in atmospheric turbulence

Required Course Materials

There is no prescribed textbook for this. Instead, I will provide printed (LaTeX) class notes, which will be posted on Canvas.

Grading Policy:

- Midterm exam: 35%
- Final exam 35%
- Project 30%

A>90; B>80; C>65; D>50

Assignments:

I will post homework on Canvas at regular intervals. However, there is no need for you to submit your homework for grading.

Description of Graded Components

The mid-term and final exams are both take-home exams. You will be allowed to use the posted class notes and homework solutions. You will not be allowed to use any other resources including Generative AI.

Course Policies

Attendance and/or Participation

Attendance will be taken in every class. Regular attendance and class participation will be used in assigning final grades.

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.

Core IMPACTS

[Not Applicable](#)

Accommodation for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) 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

Graduate student standing

Collaboration, Group Work, and Use of Generative AI

You are allowed to consult with one another on project. However, you must submit entirely your own work. You are not allowed to talk to anyone on mid-term and final take home exams. You are not allowed to use Generative AI on the take-home exams.

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

Late project submissions without prior approval will be penalized accordingly. I will accommodate re-scheduling of take-home midterm and final exams for illness, approved Institute activities and religious observance and prior approval due to your work schedules.