AE 6333 Syllabus

Rotorcraft Design I, AE 6333, Section A and Section Q, 3 Credits
Fall 2026

Instructor Information

Instructor: Marilyn Smith
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General Course Information

Description

Stochastic approach to conceptual design of aerospace systems with emphasis on Rotorcraft. Comprehensive methodologies for aerospace vehicle synthesis and sizing. Integration of technologies.

Course Learning Outcomes

The course exposes students to different rotary-wing air vehicle design techniques, including traditional rotorcraft, unmanned aerial vehicles (UAV), and urban/advanced air mobility (UAM/AAM) and allows them to apply these techniques to vehicle design in a team-oriented environment. The objectives are:

a) to familiarize the students with traditional design techniques and applications
b) to teach students modern design theory and techniques
c) to allow the student to apply the methods learned to the design of a vehicle, including sizing, synthesis, and analysis.

Required Course Materials

Leishman, *Principles of Helicopter Aerodynamics*, Cambridge University Press, 978-1107013353. This is available via Amazon and should be available at the Barnes and Noble GT bookstore.

Grading Policy:

The 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%

Assignments

- Homework/Case Studies, 4 @ 10% each (40% total)
- Individual Midterm Project, 30%
- Team Final Project, 30%

Description of Graded Components
Homework/Case studies may be individual or group assignments, as indicated on each individual assignment. The midterm project is a Matlab-based rotorcraft analysis code and validation to be accomplished by each individual student. The final project is a Matlab-based rotorcraft sizing code and analysis completed by the team, integrating, in part, the midterm codes.

Course Policies

Attendance and/or Participation
This will be an active classroom, where you will be expected to participate if you are in the local (Atlanta) section. DL students are expected to view class lectures within one week of the livestream. 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.

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 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 standing.

Familiarity with Matlab is recommended. Prior experience with rotorcraft subject matter is recommended but not required.

Collaboration, Group Work, and Use of Generative AI

The ability to use collaboration, groups or individual efforts will be defined in each assignment.

The use of outside references (e.g. textbooks) is expected and encouraged; however, students must appropriately cite (including page, figure, equation number, as appropriate) any referenced material that is used.

There are multiple types of AI that you may encounter during this class, and they have very different policies. Most fall under the category of Generative AI. If you unsure of the AI usage or want to apply AI in a manner not described in the policy stated here, please check with the faculty instructors before using.

In general, inclusion of anything you did not write in your assignments (prose or code) without proper citation will be treated as an academic misconduct case. If you are unsure if you have gone too far consider these two simple guidelines: (1) avoid hitting *copy* in a conversation with an AI assistant; (2) do not have both your assignment and the AI agent open at the same time.

Literature and technical search assistance, such as, but not limited to Google Scholar and other search engines: This is not only allowed but encouraged. Having technical depth to your design process and understanding what is available is key. However, make sure to check the original document – do not blindly accept/use excerpts from AI.

Technical writing and figure generation, such as, but not limited to ChatGPT and Copilot, is a violation of the Honor Code. This course is designed to also develop professional level skills in writing, coding, and analysis, so all work you submit must be your own. You should never include in your assignment anything that was not written directly by you without proper citation (including quotation marks and in-line citation for direct quotes). Avoid using tools that directly add content to your submission.

Spelling and grammar checkers, such as those provided in Overleaf and Microsoft Word, are acceptable (and encouraged!).

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

Assignments are due at the designated time using online submission on Canvas. Any assignment turned in after this time is late. Students have three (3) discretionary 24-hour late passes for assignments other than projects. Students may use at their discretion without asking for permission. The late passes include weekend days. Any assignment turned in after the use of the 3 passes will be considered a zero.

Students in a distance learning section will receive a standard 1-week delay on all assignments other than the final team project. This delay includes the individual midterm project.
Excused absences, such as illness, approved Institute activities or religious observances, may be a justification to receive an extension on an assignment or to re-schedule an exam. Please contact the instructor as soon as you know of a schedule conflict if this applies to you.