AE2220 and AE2221 Syllabus

Dynamics & 3D Dynamics, Section A, 3 Undergraduate Credits
Summer 2026

Instructor Information

Instructor	Email
Bradford Robertson	Bradford.robertson@asdl.gatech.edu

General Course Information

Description

Motion of particles and mass center of bodies, kinematics and kinetics of rigid bodies in plane motion, work-energy and impulse-momentum methods, 3-D dynamics of rigid bodies.

Course Learning Outcomes

Upon successful completion of the course, you will be able to

1. Identify the assumptions and the corresponding form of Equations of Motion (EoM) needed for a given Aerospace Vehicle (AV) on a given mission
2. Draw a Free Body Diagram and derive EoM that can be used for simulating the dynamics of AVs
3. Solve/simulate the EoMs to determine the dynamic response of the AVs
4. Visualize, explain, and communicate the solutions for dynamics of AVs which will help you improve your dynamics knowledge and insight, and which in turn will help you work on the design and development of AVs in the future
5. Register for, and have the foundational knowledge and skills for, follow-up courses in system dynamics, aircraft flight dynamics, spacecraft dynamics, and control system analysis, which will prepare you for a career in aerospace engineering

Required Course Materials

McGill and King, Engineering Mechanics: An Introduction to Dynamics (3rd or 4th Ed)

Grading Policy:

- 8 Homework: 25%
- 2 Tests: 50%
- Final: 25%

Scale = A: 90–100%, B: 80–89%, C: 70–79%, D: 60–69%, F: <60%

Description of Graded Components

All homework will be posted to Canvas with posted deadlines. All tests and exams will be in-class exams.

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 illnesses, family emergencies, or career development are considered excused.

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

Pre-requisite: COE2001 Statics

Co-Requisite: Math 2252 Differential Equations

Collaboration, Group Work, and Use of Generative AI

Collaboration with other students in class is encouraged, but all work turned in must reflect the student's original work.

Generative AI may not be used for any assigned homework problem. Furthermore, the use of Generative AI is discouraged in conjunction with this course.

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

All assignments are due at the designated time. Late assignments may be turned in for half credit. Excused absences or conflicts may be a justification to receive an extension for an assignment. If a schedule conflict arises that may justify an extension, please contact the instructor.

Exams missed for excused absences can be rescheduled.

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 the day of an exam is affected by inclement weather, the exam will be rescheduled, and an announcement will be made on Canvas.

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)