

# Spacecraft Flight Dynamics

## Course Information

**Instructor:** Koki Ho (kokiho@gatech.edu)

**Course Prefix and Number:** AE 4532

**Term:** Fall 2026

## Course Description

Cover fundamental material in orbit and attitude dynamics. Investigate various topics including orbits, maneuvers, interplanetary transfers, attitude coordinates, and attitude stability, among others.

## Course Learning Outcomes

This course will offer basic concepts of how spacecraft orbit around planets and/or in the vicinity of one another and what affects their stability. Throughout this course, students will develop an ability to formulate and solve flight dynamics problems through understandings of the following topics:

- Two-body problem
- Orbital elements
- Orbital transfers
- Interplanetary trajectory
- Kinematics
- Attitude dynamics
- Gravity gradient
- Advanced topics related to spacecraft orbital and attitude dynamics

## Required Course Materials

### Required Texts

- None.

### Recommended Texts

- Spaceflight Dynamics, 3rd Ed., by W. Wiesel, 2010.
- Orbital Mechanics, 2nd Ed., by J. Prussing and B. Conway, 2012
- Fundamentals of Astrodynamics, 2nd Ed., by R. Bate, D. Mueller, J. White, and W. Saylor, 2020.
- Orbital Mechanics for Engineering Students, 4th Ed., by H. Curtis, 2020.

- Analytical Mechanics of Space Systems, 4th Ed., by H. Schaub and J. Junkins, 2018.

## Grading Policy

10% Homework  
30% Midterm exam 1  
30% Midterm exam 2  
30% Final exam

A 90-100; B: 80-90; C: 70-80; D: 60-70

## Attendance Policy

This will be an active classroom, where you will be expected to participate.

## Academic and Research Honesty/Integrity Statement

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 the [Student Code of Conduct](#) and the [Academic Honor Code](#), especially [Appendix A: Graduate Addendum to the Academic Honor Code](#).

Students are expected to perform research in an ethical and responsible manner. All Doctoral and Master's Thesis students are required to take the [Responsible Conduct of Research training](#), and it is expected that students abide by the principles taught in that training while performing research for this thesis course.

Allegations of scientific or scholarly misconduct are handled in accordance with the procedures outlined by the [Policy for Responding to Allegations of Scientific or Other Scholarly Misconduct](#).

## Core IMPACTS

Not applicable.

## Accommodations 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.