Last modified: October 10, 2024

AE 6353 - Syllabus

Orbital Mechanics - 3 Credit Hours

General Information

Description

First graduate-level astrodynamics class that includes two-body orbital mechanics, orbit elements, Kepler's problem, Gauss'/Lambert's problem, perturbation, interplanetary trajectories, rocket dynamics, linear orbit theory, and circular restricted three-body orbital mechanics.

Pre- &/or Co-Requisites

AE 2220

Course Goals and Learning Outcomes

Upon completion of this course, you should be able to:

- Explain the basic principles of orbital mechanics and spacecraft performance.
- Analyze and predict orbits of spacecraft in Earth orbits, cislunar, and interplanetary space.
- Evaluate and design orbital maneuvers.
- Apply orbital mechanics principles to space missions.

Course Requirements & Grading

Note: Graded components of a course may vary with each offering. The example below is typical but subject to change.

Description of Graded Components

20%	Homework
40%	Midterm exam
40%	Final exam

Grading Scale

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%

Topics Covered

Note: The exact topics covered in a course may vary with each offering. The example below is typical but subject to change.

- Two-body orbital mechanics

- Orbit elements
- Kepler's problem
- Gauss'/Lambert's problem
- Perturbation
- Interplanetary trajectories
- Rocket dynamics
- Linear orbit theory
- Circular restricted three-body orbital mechanics.

Course Materials

Note: Course materials may vary with each offering. The example below is typical but subject to change.

Textbook

Required

- Bate, Mueller, White, and Saylor, Fundamental of Astrodynamics, 2nd Ed., Dover, 2020.
- Prussing and Conway, Orbital Mechanics, 2nd Ed., Oxford Univ. Press, 2013.

Recommended

- Wiesel, Spaceflight Dynamics, 3rd Ed., McGraw Hill, 2010.
- Vallado, Fundamentals of Astrodynamics and Applications, 5th Ed., Space Technology Library, 2022.

Course notes

Course notes are shared on the Canvas website.