Astrodynamics
EAS 4510
Class Periods: MWF, 4th (10:40 – 11:30 AM)
Location: LIT 121
Academic Term: Spring 2026

Instructor
Norman Fitz-Coy (451 NEB)
Email: nfc@ufl.edu
Office Phone: 352-392-1029
Office Hours: 8th MW (official) – open door policy in effect, make an appointment

Teaching Assistant/Peer Mentor/Supervised Teaching Student
- Mauro Franqueira (mb.franqueira@ufl.edu);
  Office Hrs: TR 11:00-1:00 PM on Zoom (see link on Canvas)

Course Description
Introduces the solar system. Includes study of two-body motion, Hohmann transfer, patched conics for interplanetary and lunar trajectories, and the restricted three-body problem. Also includes an introduction to powered flights and artificial satellite orbits.

Course Pre-Requisites / Co-Requisites
EGM 3401 (with minimum grade of C) and EGM 4313 or MAP 4305 or MAP 5304)

Course Objectives
To develop proficiency with the concepts of (i) orbital motion for both natural and artificial bodies and (ii) the attitude motion of artificial bodies.

Relation to Program Outcomes (ABET)

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

Required Textbooks and Software

Bate, R. R, Mueller, D. D., & White, J. E., Fundamentals of Astrodynamics, Dover. (ISBN 0-486-60061-0)

Recommended Textbooks

- Curtis, H., Orbital Mechanics for Engineering Students, Elsevier. (ISBN 0123747783)
- Prussing, J. E. and Conway, B. A., Orbital Mechanics, Oxford University Press. (ISBN 0-19-507834-9)
- Vallado, D., Fundamentals of Astrodynamics and Applications 3rd Ed., Microcosm, Inc. (ISBN: 978-1-881883-14-2)
- Bond, V. & Allman, M., Modern Astrodynamics: Fundamentals & Perturbations, Princeton. (ISBN 0691044597)
- Kaplan, M. H., Modern Spacecraft Dynamics and Control, John Wiley and Sons.
- Chobotov, V. A., editor, Orbital Mechanics, 2nd Edition, AIAA Educational Series.

Required Computer

Recommended Computer Specifications: https://it.ufl.edu/get-help/student-computer-recommendations/
HWCOE Computer Requirements: https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/

Course Schedule

CONCEPTS	**TEXT (BMW)**	STATUS
Introduction and Vector Review; Coordinate Systems & Transformations	Notes & §2.2, 2.6	
2-Body/N-Body Problems	Chap. 1	
Orbit Determination	Chaps. 2 & 5	
Time Dependence of ***r*** and ***v***	Chap. 4	
Orbit Maneuvers	Chap. 3	
Interplanetary Trajectories	Chap. 8	
3-Body Problem	—	
Linearization and Perturbation Methods	Chap. 9	
Time Measurements and Units	§2.9, 1.11	

Homework Assignments

Problems will be assigned regularly and will be collected on the Friday after assignment, unless stated otherwise. Late homework **will not** be accepted. **Quizzes will be administered without warning at the discretion of the instructor.** All assignments and related lecture materials will be posted under the ***Announcements*** tab.

Evaluation of Grades

Assignment	**Total Points**	**Percentage of Final Grade**
Homework/project/quiz	TBD	40%
Exam 1 (TBD February)	100	20%
Exam 2 (TBD March)	100	20%
Final Exam (C on May 1)	100	20%
	Total	**100%**

Grading Policy

Percent	**Grade**	**Percent**	**Grade**	**Percent**	**Grade**
95.0-100.0	A	87-94.95	A-	83.5-86.9	B+
80-83.49	B	77-79.9	B-	73.5-76.9	C+
70-73.49	C	67-69.9	C-	63.5-66.9	D+
60-63.49	D	57-59.9	D-	0 - 56.9	E

More information on UF grading policy may be found at: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Academic Policies & Resources

To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: https://go.ufl.edu/syllabuspolicies. Instructor-specific guidelines for courses must accommodate these policies.

Commitment to a Positive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

If you feel like your performance in class is being impacted, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu