

# ASEN 3700 – Orbital Mechanics/Attitude Dynamics and Control

## Syllabus, Spring 2023

Smead Aerospace Engineering  
University of Colorado Boulder

### Overview

Professor:	M. J. Holzinger <a href="mailto:marcus.holzinger@colorado.edu">marcus.holzinger@colorado.edu</a>
Schedule:	Tuesdays, Thursdays, 4:00pm-5:15pm, AERO 120
Credits:	3.0 semester hours
Required Texts:	Orbital Mechanics for Engineering Students, 4 <sup>th</sup> Ed. Rev.
Reference Texts:	None
Final Exam:	Monday, 18 December, 4:30pm-6:30pm, AERO 120 (Optional)
Online Support	Canvas
Prerequisites	ASEN 2003 or ASEN 2703
Office Hours:	Mondays, 3:15pm-4:15pm in AERO 457 Wednesdays, 4-5pm on <a href="#">Zoom</a> (Meeting ID: 940 6284 8322)
Teaching Team	Alex Meyer (Lead) ( <a href="mailto:Alex.Meyer@colorado.edu">Alex.Meyer@colorado.edu</a> ) Office Hours: Mondays, 2-4pm (AERO N453) Wednesdays, 9-11am (AERO 403) Fridays, 12-2pm (AERO 403) Study Hall: Tuesdays, 5:30pm-7:00pm, AERO 120 Julian Lema Bulliard ( <a href="mailto:Julian.LemaBulliard@colorado.edu">Julian.LemaBulliard@colorado.edu</a> ) HW Review Session: Fridays, 10:00am-12:00pm, AERO N240 Study Hall: Thursdays, 5:30pm-7:00pm, AERO 120 Amanda Marlow ( <a href="mailto:Amanda.Marlow@colorado.edu">Amanda.Marlow@colorado.edu</a> ) Study Hall: Thursdays, 5:30pm-7:00pm, AERO 120 Ashwin Raju ( <a href="mailto:Ashwin.Raju@colorado.edu">Ashwin.Raju@colorado.edu</a> ) HW Review Session: Fridays, 10:00am-12:00pm, AERO N240 Study Hall: Tuesdays, 5:30pm-7:00pm, AERO 120

## General Information

### Course Description

Presents the fundamentals of orbital mechanics, 3D rigid body dynamics and satellite attitude dynamics and controls.

### Goals and Learning Objectives

Students will learn the basics of spacecraft orbital and attitude motion.

The first component of the course focuses on dynamics and control of the pointing attitude of spacecraft. Nearly all spacecraft must be accurately pointed to accomplish their mission, yet the natural behavior in orbit is typically uncontrolled tumbling. We will dev0 (i)3 (o)1w73.1 ed a





## Final Exam

The final exam is optional: students are not required to take the Final Exam and the Final Exam will not be counted towards your grade on its own. The Final Exam will be used to replace up to 2 Exam grades. The Final Exam will consist of 3 questions, each one covering material from a different Exam. You will choose up to 2 questions to answer. If your score on a given Final Exam question is higher than your score for the corresponding Exam, your Exam score will be replaced with your score on that Final Exam question. If your score on a given Final Exam question is lower than your score for that Exam, your Exam score will remain unchanged.

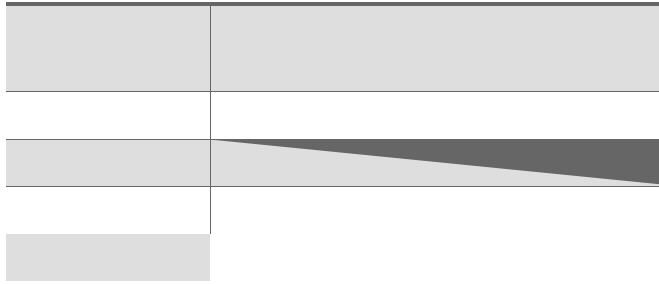
The Final Exam will take place during the university-scheduled final exam time, which is:

Optional Final Exam: Monday, 18 December, 4:30pm-6:30pm, AERO 120 (Optional)

## Academic Integrity Information

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: [honor@colorado.edu](mailto:honor@colorado.edu), 303-492-5550. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.



Please know that faculty and teaching team have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about their rights, support resources, and reporting options.

### Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, all homework due dates and exam dates are posted at the beginning of the semester.

To accommodate any conflicts, you must coordinate with the instructor within the first two weeks of class (by 5pm, September 8, 2023).