

# ASEN5050 – Space Flight Dynamics – Fall 2018

## **Instructor:**

Professor Natasha Bosanac

Office: ECNT 418

Ph: 303-492-7061

Email: [natasha.bosanac@colorado.edu](mailto:natasha.bosanac@colorado.edu)

Office Hours: T 3.30-4.30pm, W 2-3pm, Th 3.30-4.30pm, additional appointments available upon request.

During office hours, distance students may call my office number.

## **Lectures:**

Tues, Thurs 2:00-3:15pm

Lectures held in ECCS 1B12

Labs held in ECCS 1B12 and ECCR 239.

Distance students may view lectures synchronously using Zoom, or at a later date via the lecture recordings available on Canvas. An email with instructions will be sent before the first class.

## **Course Webpage:**

Course accessible through Canvas at [canvas.colorado.edu](https://canvas.colorado.edu)

## **Teaching Assistants:**

Stefano Bonasera

Email: [Stefano.Bonasera@colorado.edu](mailto:Stefano.Bonasera@colorado.edu)

Office Hours: M 9-10.30am in George Born room, W 12.30-2pm in AES Grad Lounge

Karl Sanchez

Email: [Karl.Sanchez@colorado.edu](mailto:Karl.Sanchez@colorado.edu)

Office Hours: F 10am-12pm in AES Grad Lounge

## **Required Textbook:**

David A. Vallado, “Fundamentals of Astrodynamics and Applications, 4<sup>th</sup> Edition”, 2013, ISBN: 978 11881883180

This textbook can be purchased at the CU Bookstore and from external sellers. If you are unable to purchase the text or have a previous edition, a copy will be designated as a course reserve in the Gemmill Engineering, Math and Physics library with a limited borrowing period (~4 hours).

Errata document is posted on the Canvas page.

## **Course Overview:**

In this course, we will study the kinematics and dynamics of celestial bodies and artificial satellites moving under the influence of forces common to the space flight environment; most importantly, bodies moving under the influence of gravity.

## **Grading Policy:**

Take home Midterm (25%)

Take home Final Exam (25%)

Homework (30%)

Research Project (20%)

### **Important Dates:**

A course schedule including lecture topics and assessment due dates will be made available on the course webpage.

October 18 – Take home midterm exam assigned

October 23 – Take home midterm exam due

November 20, 22 – No Class – Fall Break & Thanksgiving

November 29 – Research Projects Due

December 13 – Last day of class, Take home final exam assigned

December 17 – Take home final exam due

Note: *Take-home exam dates are subject to change*

### **Homework Policy:**

- While collaboration is permitted on homework, each student must submit a unique assignment write-up. Copying material from any resource (including solutions manuals) is plagiarism and is an Honor Code violation.
- Submitted homework must be neat and professional, with clear working. Either handwritten or typed solutions are acceptable.
- Submitted homework must demonstrate understanding of the problem through: inclusion of diagrams (where appropriate), correct notation and terminology with definitions, a clear explanation of the approach used to solve the problem, demonstration of each of the key steps or equations used in obtaining a solution, and a clear answer with appropriate units. If MATLAB or a similar numerical software package is used to solve a problem, include your code. However, code **may not** be submitted solely as your solution – **for full credit, a write-up with the components described above must accompany the solution to each problem (unless otherwise specified)**.
- If you must miss a class for an excused absence or extenuating circumstances, please contact the instructor to make alternative arrangements for homework submission in advance of the deadline, where possible.
- Although each homework assignment will have several problems, all problems may not be graded. However, solutions will be provided to you for all problems.
- Homework regrade requests must be submitted to the TAs within two weeks of the assessment being returned with a clear explanation of the issue. For homework submitted as a paper copy, the explanation must be written on a sheet of paper attached to the front of the homework. For homework submitted electronically, the explanation may be sent via email.

### **Homework Submission Policy:**

- *On-campus students:* For full credit, homework must be submitted by the beginning of class (**2pm MT**) on the due date. You may elect to submit your assessment either: 1) as a hard copy in person at the beginning of class; or 2) electronically as a single **pdf** uploaded to the correct folder on Canvas. If you elect to submit your assessments electronically, you are responsible for verifying that the document is uploaded correctly, in the correct location and is readable.
- *Distance students:* For full credit, homework must be submitted as a single **pdf** via Canvas by **11.59pm MT** on the due date. You are responsible for verifying that the document is uploaded correctly, in the correct location and is readable.

- *Late homework policy*: Except in the case where an extension has been granted, late homework will not be graded and will not receive credit.

**Distance Students:**

- This course uses the Zoom conferencing tool which is currently not accessible to users using assistive technology. If you use assistive technology to access the course material, please contact me immediately to discuss.
- Zoom meeting information, to virtually join the class synchronously (i.e., T,Th 2pm-3.15pm Boulder time), will be provided to you by the instructor.
- Videos of the lectures will be available after the class through Canvas.

**Course Software:**

- This course requires the use of astrodynamics modeling software (e.g., Systems Tool Kit, General Mission Analysis Tool) which are currently not accessible to users using assistive technology. If you use assistive technology to access the course material, please contact me immediately to discuss.

**Accommodation for Disabilities:**

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu) for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

**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, please discuss with me any conflicts you have so we can make alternative arrangements as soon as possible, preferably in the first two weeks of the course.

See the [campus policy regarding religious observances](#) for full details.

**Classroom Behavior:**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

**Sexual Misconduct, Discrimination, Harassment, and/or Related Retaliation:**

The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

**Honor Code:**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, 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 the Honor Code ([honor@colorado.edu](mailto:honor@colorado.edu)); 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).