

# ASEN 5335, Aerospace Environment: Syllabus

**Location and Time:** AERO N240, TTH 8:30 – 9:45 am  
And on Zoom:

**Instructor:** Prof. Robert Marshall, AES  
robert.marshall@colorado.edu  
Office: AERO 419  
Office hours: Thursday, 12 – 1 pm  
Office hours will be conducted at the same Zoom link above.

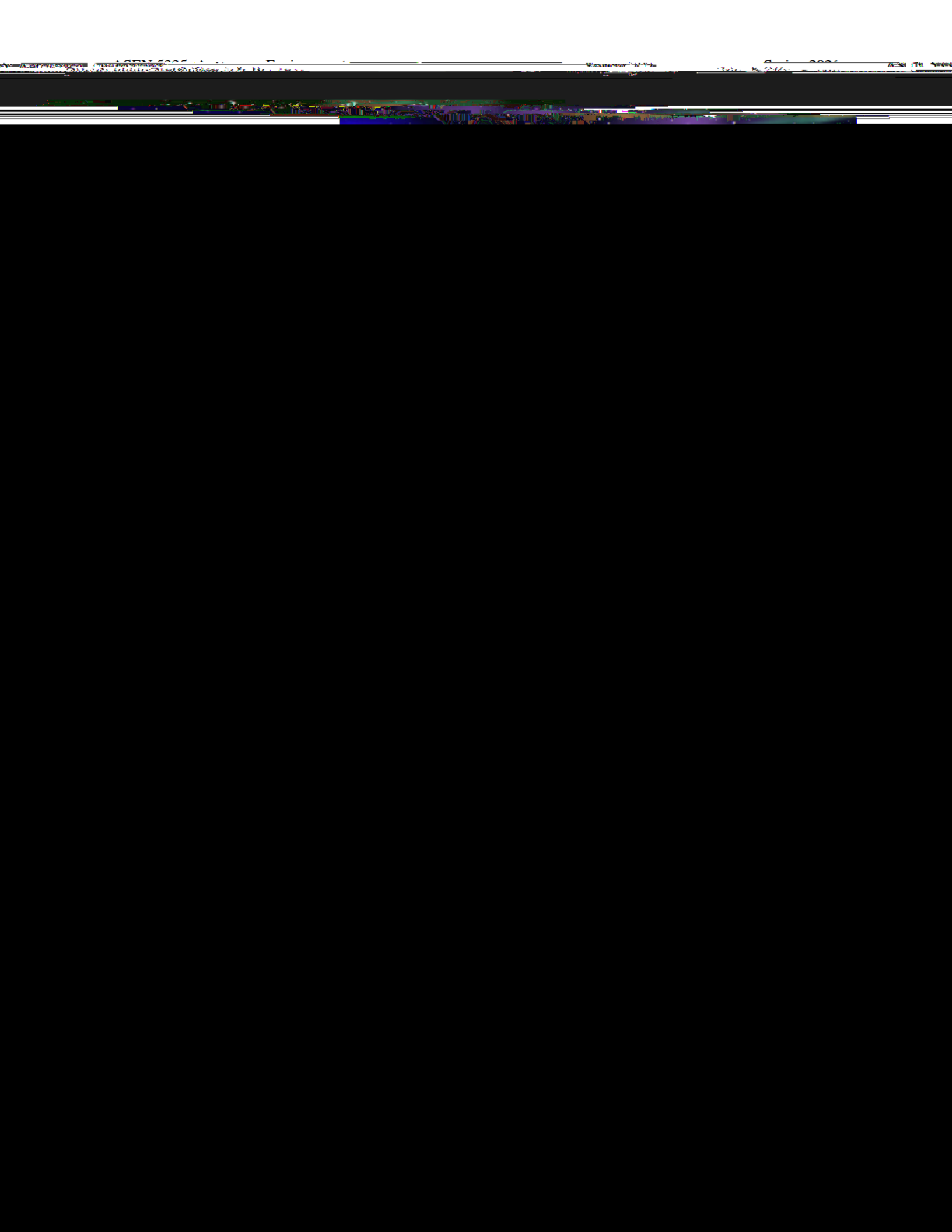
**Teaching Assistants:**  
Alexandra Wold: alexandra.wold@colorado.edu  
Office hours: Monday, 2 – 4 pm  
Aanshi Panchal: aanshi.panchal@colorado.edu  
Office hours: Saturday, 10 am – 12 pm  
TA office hours will be conducted at the same Zoom link above.

## 1 Overview

*Aerospace Environment* is a core course in the RSESS focus area, meant to introduce you to the near-Earth space environment and its effects on spacecraft, communications systems, astronauts, and more. Aerospace engineers working on space technology or applications need a broad understanding of the environment in order to design their spacecraft appropriately. But more generally, anyone with a passion for space will be fascinated to learn about the different regions of the space environment, how they couple together and affect each other, and how they affect our daily lives.

We define the “near-Earth” space environment as the region of space surrounding the Earth which is affected by the sun and where most of our satellites operate. As such, this course focuses on the space environment surrounding the Earth – don’t expect to learn about the solar system, galaxies, interplanetary space, and so on. However, we will take a look at the environments around other planets for comparison with Earth, for example the “near-Jupiter” space environment.

The near-Earth space environment extends from the surface of the Earth up to the bow shock, which is the outer boundary of the magnetosphere. Within this environment there are different overlapping regions: the atmosphere, made up of neutral molecules and atoms; the ionosphere, where the gas of the atmosphere becomes ionized; the plasmasphere, where the gas is completely ionized and trapped in Earth’s magnetic



available (lectures, webcasts, papers, lab videos), and homework assignments associated with each (see below)

Optional reading material that provides additional information is listed below

1. "The Solar System" Professor Dan Li, 2010

2. "The Solar System" Michael

3. "The Solar System and Its Effects on Solar Systems" AIAA, 2016

4. "The Solar System" NASA

## 5 Logistics

1. **Office Hours:** I will be available on Zoom for office hours at (TBD); feel free to drop in at that time

**Exams:** There will be six unit quizzes, one for each of the first six modules, as well as one final exam. The quizzes will cover material in the current module, but may require knowledge from earlier modules. The quizzes will be administered through Canvas. You'll have a 24-hour window to complete them, but only one hour once you start. Each quiz is worth 10% of the final grade. The final exam will be comprehensive, will be scheduled for the regular final exam window, and will be worth 20% of the final grade.

**Participation:** Attendance and participation in class discussion is a must! Lectures are designed to have lots of questions from students and engaging discussion. Please e-mail me if you expect to have excused absences from lecture. While there is no grade for participation, I will take it into account when I consider "edge cases" in final grades.

## 7 University Policies

### 7.1 Classroom Behavior

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. 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. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

### 7.2 Requirements for COVID-19

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community



## 7.7 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, inform the instructor well in advance of religious holidays that conflict with lectures, due dates, or quizzes, and we will work together to accommodate these conflicts.

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