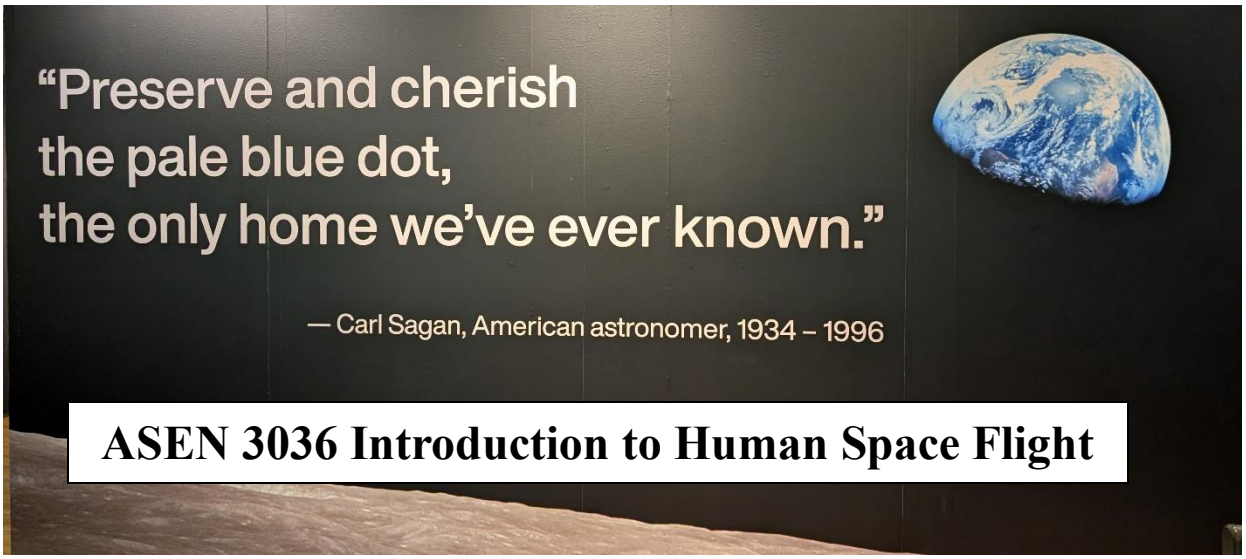

Syllabus Spring 2026

This course introduces students to the challenges and rewards of human space flight. Historical and current space programs and spacecraft will be discussed, along with the motivation, cost and rationale for human space exploration. An overview of the space environment will be presented in the context of what is needed to sustain human life and health, including physiological and psychological concerns, in a space habitat. Current events including space research will also be highlighted. Students will learn about the astronaut selection and training processes. Finally, anomalies, mission operations and future program directions, with some insight into career planning, will be covered. The emphasis on learning will be to understand the way humans approach the exploration of space and how such a bold endeavor affects us individually and as humans. Students will be encouraged to explore through readings and research different perspectives of spaceflight to include political, scientific, historical, economic, cultural, and social as well as to consider the impact on our future.

Instructor: Barbra Sobhani, Director, NASA Space Grant, Teaching Faculty

Email: *Barbra.sobhani@colorado.edu*

Prerequisites: None, open to all majors at any level

Space Minor: This class is one of the elective courses for the CU Space Minor that is open to any undergraduate student from any major. Contact the Space Minor Program Manager, Ashleigh Bailey at Ashleigh.Bailey@Colorado.edu with Space Minor related questions. For more information on the CU Space Minor see: http://www.colorado.edu/spaceminor/learn-more

Textbook: Harrison, A., “*Spacefaring - The Human Dimension*”, University of California Press, Los Angeles, CA, 2001

Grading Breakdown: Homework (30%), Quizzes (20%), Project (20%), Exam 1 (15%), Exam 2 (15%)

Class Time, Location, and Format

This semester, the class meets MWF from 1:55 – 2:45pm in AERO 111. This class meets in person. We will have several guest speakers throughout the semester, including experts in many different fields. If there is a need to meet remotely, we will use the following zoom:

Canvas

All assignments and activities for this course are available on Canvas https://canvas.colorado.edu/. Check Canvas and your @colorado.edu email regularly for updates and reminders about deadlines and other course information.

Expectations

"Clear is kind" is a phrase Barb believes is integral to this course. She has expectations of each student and she wants each student to understand what they can expect from her. Those expectations can be found here.

Attendance Policy

You are expected to attend class. Quizzes and Exams will be given during class time. Guest lecturers will also be contributing their time, so please respect them by attending and giving them your full attention. Any correspondence concerning attendance shall be sent in Canvas. If you have questions or concerns about the attendance policy, please come to office hours.

- If you are sick and are unable to attend class and you miss an in-class assignment, send an email stating that you are sick *before class time* in order to be excused. Emails about sick absences received 8 or more hours after the missed class will not be accepted. *DO NOT include personal details about your illness as they are not required. Simply say, I am sick.*

- Absences related to official CU programs (athletics, clubs, marching band, ROTC, etc.) will be excused as long as you provide Barb a letter from that organization, including your name and class dates that will be missed, two weeks prior to the absence.

- If you miss an in-class quiz or assignment and your absence is excused, you may make up the quiz during office hours within one week of your return to class.

- Due dates for other assignments will be extended for two days for each day of class that is excused as long as the assignment was due during the absence. Please note, most assignments are not due on class days. There will be no extension of due dates for unexcused absences.

- Other absences (e.g. family emergency, jury duty, car accidents, etc.) will be excused on a case-by-case basis as long as we receive an email with sufficient information within 8 hours of the missed class.

After communicating your absence per guidelines above, in order to receive full credit for any excused absence, each student shall; one, complete the assignments due for that day, two, watch the classroom video on Canvas via Lecture Capture, three, include at least one Aha moment for the lecture, and four, complete all items by the agreed upon due date, which in most cases is two days after the missed lecture.

Getting Help

If you have specific questions about the class:

- Review the syllabus, the schedule, class assignment descriptions, and Canvas for the answers.
- Email barbra.sobhani@colorado.edu with "HELP" in the subject line so your email will get routed to the top of Barb's email inbox.
- Visit Barb's office hours Mondays 3:30 to 4:30 PM Mountain Time via Zoom OR stay after class to chat with Barb or a TF if you have a quick question or need something clarified.
- **Meet** with a TF during their office hours which will be posted mid semester on Canvas > Modules > Course Overview and Admin.
- **Schedule** an appointment with Barb via a HELP email described above if you can't make her office hours.
- **Post** to the general "Got a Question" Canvas Discussion forum with course-related questions the entire class could benefit from hearing.
- **DO NOT** wait until it is too late. Barb wishes to help all students be successful but he can only help so much depending on when the student reaches out for help.

Required Readings:

- Harrison, A., "*Spacefaring - The Human Dimension*", University of California Press, Los Angeles, CA, 2001
- Various articles and NASA reports provided on the course home page

Suggested Readings:

- O'Neill, G. K., *The High Frontier - Human Colonies in Space*, Space Studies Institute Press, Princeton, NJ, 1989
- Hurt, H., *For All Mankind*, The Atlantic Monthly Press, New York, NY, 1988
- Kranz, G. *Failure Is Not an Option*, Simon and Schuster, New York, NY, 2000
- Burrough, B., *Dragonfly – NASA and the Crisis Aboard Mir*, Harper Collins, New York, NY, 1998
- Jones, T., *Sky Walking – An Astronaut's Memoir*, Harper Collins, New York, NY, 2006
- Mullane, M., *Riding Rockets – The Outrageous Tales of a Space Shuttle Astronaut*, Scribner, New York, NY, 2006

- Any science fiction by H.G. Wells, Jules Verne, Isaac Asimov, Robert Heinlein, Arthur C. Clark

Essays / Project / Case Study:

Students will research and write about topics associated with human spaceflight and the social, political, and technical implications. Essays, project report, or case study format is used to explore complex human spaceflight issues to extend the student's knowledge and allow detailed contextual analysis of specific topics or events. Students will be asked to write about current topics associated with human spaceflight. Examples are:

- Future human space exploration
- Political and budget implications on human spaceflight
- Human spacecraft and spacecraft systems
- US space accidents

A project assignment is used to have students develop a plan for an exploration spacecraft using all information learned in the semester about human spacecraft systems. Result of the project will be a presentation and written report.

Class and Pertinent CU Policy - Please read this.

Link: Class Policy Information

Lecture Topic Outline:

- Introduction and Course Overview. Why Space?
- History of Human Spaceflight
- Space Environment
- Spacecraft Overview
- Life Support Requirements
- Physiological Effects and Countermeasures
- Life Support Systems
- Spaceflight Analogs and Human Factors
- Habitability and Crew Accommodations
- Astronaut Training
- Astronaut Selection
- Psychology of Spaceflight - Group Dynamics, Stress, and Coping
- Sociology of Spaceflight
- Working in Space
- Robotics
- Extra Vehicular Activity - Physiology and Space Suit Design
- Mission Operations and Planning
- Surface Elements
- Space Accidents and Anomalies

- Space Tourism
- Next Human Spacecraft Systems
- Space Future – Settlements, Migration
- Life Beyond Earth
- Space Career Planning
- Space Policy and Funding
- Special Topics – Guest Lectures