

ASEN 4018 Fall 2026

Aerospace Senior Projects

Course Overview

ASEN 4018/ASEN 4028 is the undergraduate capstone course sequence for the Ann and HJ Smead Department of Aerospace Engineering and Sciences (AES). ASEN 4018 provides an experiential learning environment in which students apply the technical skills acquired throughout the AES curriculum to design and model an aerospace system to meet a defined set of requirements. In the follow-on course (ASEN 4028), students will fabricate or simulate their systems, test their designs to verify requirements are met, validate the system can complete mission objectives, and close the loop between model predictions and actual system performance.

Course Meeting Times and Locations

Course	Day	Time	Section	Faculty Advisor	Room
Lecture	M	12:50-1:40 PM	10	Wingate	Zoom
Seminar	W	12:50-1:40 PM	10	Wingate	AERO N100 & Zoom
Lab	MW	10:40-12:30 PM	15	Sternovsky Wingate	AERO N100
	MW	10:40-12:30 PM	16	Hoke	AERO 111
	MW	10:40-12:30 PM	17	Holzinger Matsuo	AERO N240
	TTH	1:00- 2:50 PM	11	Hayman Nabity	AERO 114
	TTH	1:00- 2:50 PM	12	Li Neogi	AERO N240
	TTH	10:40 - 12:30 PM	13	Rafi	AERO N100
	TTH	1:00- 2:50 PM	14	Rafi	AERO N100

Lecture zoom link and seminar schedule will be posted on main Canvas page.

Course Faculty Advisors

Section	Name	Email	Expertise
Lecture	Prof. Wingate	kathryn.wingate@colorado.edu	Systems
11	Prof. Hayman	Allison.P.Anderson@Colorado.EDU	Bioastro, Cognitive Engineering
	Prof. Nabity	james.nabity@colorado.edu	Bioastro, Propulsion
12	Prof. Li	Xinlin.Li@lasp.colorado.edu	Remote Sensing
	Prof. Neogi	Sanghamitra.Neogi@Colorado.EDU	Structures, Quantum Engineering
13	Prof. Rafi	Melvin.Rafi@colorado.edu	Autonomy, Controls
14	Prof. Rafi	Melvin.Rafi@colorado.edu	
15	Prof. Sternovsky	Zoltan.Sternovsky@Colorado.EDU	Remote Sensing
	Prof. Wingate	kathryn.wingate@colorado.edu	Mechanical Design
16	Prof. Hoke	Charles.Hoke@colorado.edu	Aircraft Design, Aerodynamics

17	Prof. Holzinger	marcus.holzinger@Colorado.EDU	Astrodynamics
17	Prof. Matsuo	tomoko.matsuo@colorado.edu	Remote Sensing, Software
Electronics	Prof. Schwartz	Trudy.Schwartz@colorado.edu	Electronics, Sensors, Testing

Course Support Staff:

Expertise	Name	Email	Office
Electronics and Software	Joy Wakimura Madeline Hamma YuKang Kong	Joy.Wakimura@colorado.edu Madeline.Hamma@colorado.edu YuKang.Kong@colorado.edu	Electronics Shop
Manufacturing and Machining	Nate Coyle	Nathan.Coyle@Colorado.EDU	Machine Shop
Prototyping and Project Spaces	Gerald Yoho	Gerald.Yoho@Colorado.EDU	AERO 141E
Finance and Procurement	Jacqui Stang	aerofinance@colorado.edu	Main Office
Section TFs	Please refer to your course section MS Teams page.		

Class Web Site:

log on to <https://canvas.colorado.edu>

Prerequisites:

ASEN 1022 and all core ASEN 3XXX courses.

Course Learning Objectives

1. Project based learning

Students shall apply knowledge learned in previous courses to design, model, simulate or fabricate, integrate, and test an open-ended aerospace engineering design project.

2. Systems Engineering and Aerospace Architecture Frameworks

Students shall utilize systems engineering methods and aerospace architecture frameworks to design to requirements, verify requirements through modeling, integration and test, and present the results at technical reviews.

3. Modeling

Students shall develop engineering models that predict design performance and refine these models through testing.

4. Teamwork

Students shall work on complex aerospace projects that require integration of sub-systems and

cooperation within large teams.

5. Program management

Students shall apply program management tools to break the design project into manageable tasks with clear milestones and deliverables.

6. Technical communication

Students shall gain experience in documenting and communicating their design progress according to professional engineering standards.

Course Delivery

Lecture:

Lectures will cover different aspects of the aerospace design process at a system level. Lectures are every Monday from 12:50 to 1:40 PM and will be delivered via zoom. Virtual attendance is required. Lectures will be recorded. Students should utilize recordings to review materials, or if they have an approved course conflict, job interview, or a family or medical emergency. Please note there is no need to alert the instructional team if you need to watch a recorded lecture due to a job interview or emergency.

Lab

Lab periods are dedicated times for students to meet with design teams or sub-teams, work on design tasks, and attend office hours. Faculty advisors will give instructions on how their section's lab periods will be structured. In-person attendance is required and expected for the entire lab period. If you need to miss a lab due to a job interview or family/medical emergency, please reach out to your PM and sub-team lead and give a minimum of 24 hours' notice.

Seminars

Students are required to attend three seminars of their choice in the fall semester. The workshop schedule and sign-up links are on Canvas.

Assignments and Grading

Grade breakdowns can be found below. Assignment details and due dates can be found on Canvas.

Assignment	Percent Total Grade
Design Review 1 (Team Grade)	20%
Design Review 2 (Team Grade)	25%
Final Report (Team Grade)	25%
Individual Performance Grade	25%
Team Charter	P/F
Workshop Attendance	5%

To be successful in this class, students are expected to professionally engage in team meetings and discussions, contribute high quality technical work towards the project, complete deliverables on time, and assist and support their team members. Students must shift from a “school” mindset, where homework is submitted for grading, to a “professional” mindset where deliverables are thoroughly reviewed, carefully edited, and submitted in final form. **Only students who participate and contribute high quality work to the team deliverables will receive the team grades above.**

Assignment details can be found on Canvas or MS Teams.

Individual performance grades will be determined by peer evals, participation in team meetings, and interactions with AES staff and faculty, industry mentors, and university faculty. Peer evaluations will be administered after Design Review 1 and Design Review 2.

Design reviews are oral presentations to a review board consisting of AES faculty, staff, and various industry mentors. While the section’s faculty advisor will assign the team grade for the design review, other reviewers will provide feedback and may assign action items.

Students are required to attend and actively participate in three seminars.

Professionalism

Students are expected to act professionally toward their teammates, industry mentors, university staff and faculty, and fellow students. They must use building spaces and resources appropriately and respectfully. Failure to treat others professionally or to properly use shared spaces may result in a reduction of the ‘Individual Performance’ grade. Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings—whether in person, remote, or online. Individuals who fail to meet these behavioral standards may be subject to disciplinary action.

Safety

Safety shall be a primary concern for all students, faculty, and staff. Students must take the required training if they plan to use shops, and some projects may require environmental health and safety training workshops. Any work conducted in senior projects must be done in accordance with all university safety policies which can be found at <https://www.colorado.edu/ehs/>. Any activity on the project that has a potential safety impact, as solely determined by the faculty advisor or design review board, must be cleared by a safety board before any testing, fabrication, or prototyping. Flight testing must go through appropriate CU Flight Operations channels.

Resources

Senior Project Labs

Each team will be assigned space in the senior projects labs for prototyping, fabrication, assembly, and testing of their projects. Please respect your peers and do not disturb any items that do not belong to your team. Each team will also have a storage cabinet where they can put any supplies or sensitive equipment. Remember this is a shared space and teams should return tools and clean up when

finished. Use of paints, thinners, epoxies or other potentially hazardous materials is not permitted in this space without prior approval of Gerald Yoho. **All work conducted in these spaces must be in accordance with all pertinent department and university safety policies.**

AES Machine Shop

The AES machine shop is typically accessible daily when Nate Coyle, Zach Sherritt or a designated assistant is available, and after completing the required safety training and machining workshop. Please ensure Nate Coyle is involved early in the design of components for manufacturing.

AES Electronics Shop

The AES electronics shop can provide limited space for electronics fabrication, integration and test. Access will be provided after completing the required training and workshops. Only students who have completed workshops are allowed in the AES electronics shop.

AES Woodworking and Composites Lab

The AES department has developed a woodworking and composite fabrication lab to be used for both teaching and research. Contact Nate Coyle or Zach Sherritt to request access, and space will be provided after completing the required training and workshops.

AES 3D Printing and Prototyping Tools

The AES department has a number of 3D printers and prototyping tools. Contact Gerald Yoho for more information on submitting 3D print and prototyping job shop requests.

University of Colorado Standard Syllabus Policies

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 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. Understanding the course's syllabus is a vital part of adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. Students found responsible for violating the Honor Code will be assigned resolution outcomes from Student Conduct & Conflict Resolution and will be subject to academic sanctions from the faculty member. Visit [Honor Code](#) for more information on the academic integrity policy.

Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

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 for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

If you have a temporary illness, injury or required medical isolation for which you require adjustment, please email your faculty advisor and cc the course coordinator immediately.

Accommodation for Religious Obligations

Instructional faculty members must make every reasonable effort to accommodate all students who have conflicts with scheduled exams, assignment deadlines or required attendance due to a religious observance. Whenever possible, students must notify the instructional faculty member at least two weeks in advance of the expected exam, assignment deadline, or attendance conflict to request an accommodation for religious observance. If the start date of the course is less than two weeks before the date of requested accommodation, students must notify the instructional faculty member on the start date of the course. [See the Student Academic Accommodations for Religious Observances Policy](#) for more information.

Student Names and Pronouns

CU Boulder recognizes that students' legal information does not always align with how they identify. If you wish to have a name other than your legal name appear on your instructors' class rosters and in Canvas, or if you wish to choose pronouns to appear on your instructors' class rosters and in Canvas, visit the [Registrar's website](#) for instructions on how to change your personal information in university systems.

Classroom Behavior

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure 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, marital status, political affiliation, or political philosophy.

Additional classroom behavior information

- [Student Classroom and Course-Related Behavior Policy](#).
- [Student Code of Conduct](#).
- [Office of Institutional Equity and Compliance](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering a productive and welcoming learning, working, and living environment. University policy prohibits [protected-class](#) discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- or off-campus.

Denial of an approved accommodation for disability, religious observance, or pregnancy or pregnancy related medical conditions may be discriminatory.

The [Office of Institutional Equity and Compliance \(OIEC\)](#) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email OIEC@colorado.edu. Information about university policies, [OIEC reporting options](#), and [OIEC support resources](#) including confidential services can be found on the [OIEC website](#).

Faculty and graduate instructors are required to inform OIEC when someone discloses misconduct regardless of when or where it occurred. This is to ensure that those impacted receive outreach from OIEC about resolution options and support resources. To learn more about reporting and support options for a variety of concerns, visit the [Don't Ignore It page](#).

Mental Health and Wellness

The University of Colorado Boulder is committed to supporting students' mental health and overall wellbeing. If personal, academic, or emotional challenges are affecting your wellbeing or success, [Counseling and Psychiatric Services \(CAPS\)](#), is here to help. CAPS offers counseling, referrals, psychiatric care, crisis support, and much more. Visit CAPS in the C4C, or call (303) 492-2277, 24/7.

Acceptable Use of AI in This Class

You may not utilize AI to generate assignments in this course. However, if you wish to use AI to edit assignments, please discuss this with your faculty advisor. They will give you guidance on acceptable use of AI in their section. If AI is allowed in an assignment, please include a paragraph at the end of assignment documenting how AI was utilized.