ASEN 2502 – Fall 2025

Introduction to Aeronautics

Lecture Day/Times: **Section 010 -** Mon/Wed 03:00 PM - 03:50 PM (Aero 120)
Section 020 - Mon/Wed 04:05 PM - 04:55 PM (Aero 120)

Lab Day/Times: **Section 011** - Fri 12:40 PM - 02:30 PM (Aero 141 - PILOT)
Section 021 - Fri 2:45 PM - 04:35 PM (Aero 141 - PILOT)

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Teaching Assistants/Fellows:

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Class Canvas Website: https://canvas.colorado.edu/courses/127545

Class Gradescope Website: https://www.gradescope.com/courses/1079399

Texts (Required): Anderson, **Introduction to Flight**, 8th or 9th ed. (hardcopy or electronic version)

Pre/Co-requisites: Requires prerequisite courses ASEN 1030 or ASEN 1320 or CSCI 1300 or CHEN 1310 or ECEN 1310 and APPM 1360 or MATH 2300 and PHYS 1110 (all minimum grade C-).

Required Equipment / Software

- Access to a computer or laptop
- Computational / Programming Software
    - Many assignments will require access to a computer and basic programming skills. Computer programming skills are a prerequisite for this class, e.g. GEEN 1300, ASEN 1320/CSCI 1300. We will not teach computer programming, although we will make an effort to formulate the assignments to emphasize proper computing skills.
    - MATLAB is highly recommended but not required. You can download a free MATLAB license for your personal computer from CU at https://oit.colorado.edu/software-hardware/software-downloads-and-licensing/matlab. You can also use MATLAB Online for this course at https://matlab.mathworks.com/.

- Use of Excel, Python, or any other programming language is allowed; however, you must consider ease of integration across your team members as some consistency across your team is required.

Course Material Costs: The lab will provide basic fabrication materials and tools to build your prototype aircraft at no cost; however, students may be required to contribute additional money towards their team fabrication budget for this course to augment the materials provided. If additional funds are required, total out-of-pocket expenses by students are capped at a maximum of $5 and cannot be exceeded by any team or individual regardless of willingness to spend more to ensure all teams operate on the same constrained budget. Materials provided by the course do not count against your budget costs.

Course Learning Objectives:

After completion of this course, a student should be able to:

1. Demonstrate an understanding of and apply the fundamental physics that form the foundation of aerodynamic flight, including the behavior of gases, standard atmospheric models, conservation laws, and fluid dynamic equations.
2. Demonstrate a working knowledge of standard models of aircraft by applying important aerodynamic, propulsive, and structural principles that shape their design. Analyze airfoils, wings, aircraft structures, and propulsion systems.
3. Use these skills to characterize and analyze aircraft performance across the spectrum of the aircraft flight envelope. Aircraft performance includes flight dynamics in all phases of flight, aerodynamic and propulsive modeling, static and dynamic stability, aircraft control, and mission design.
4. Collaborate effectively in multidisciplinary teams to conduct aeronautics-related laboratory experiments, analyze data, and communicate technical findings, while demonstrating accountability, respectful communication, and an understanding of the team-based nature of aerospace engineering practice.
5. Demonstrate an understanding of both the historical development of aviation and its key contributors and the future of atmospheric flight. Apply foundational principles of engineering ethics to evaluate the human, societal, environmental, and global impacts of past aeronautical development as well as future innovation.

Course Structure: This course is a hybrid lecture and lab course with lectures focused on establishing foundational knowledge of aeronautical concepts and labs focused on reinforcing concepts through the application of knowledge in an engineering context. ***All labs will be conducted in-person only and lab instruction is NOT recorded.*** Due to the emphasis on team learning objectives of the course and the critical nature of good team communication, students are expected to attend all scheduled lab periods in person, and ***attendance will be a part of a student's individual grade determination.***

Assessments & Grading:

Individual Performance Based Assessment	
1) Exam #1	20%
2) Exam #2	20%
3) Final Exam	30%
INDIVIDUAL TOTAL	**70%**
Team Engineering Based Assessment (Includes peer eval and lab attendance portions)	
1) Wind Tunnel Lab (Total)	10%
2) Flight Sim Lab (Total)	10%
3) Design Lab (Total)	10%
TEAM TOTAL	**30%**

Letter Grade	Range
A	100% to 93%
A-	< 93% to 90%
B+	< 90% to 87%
B	< 87% to 83%
B-	< 83% to 80%
C+	< 80% to 77%
C	< 77% to 73%
C-	< 73% to 70%
D+	< 70% to 67%
D	< 67% to 63%
D-	< 63% to 60%
F	< 60% to 0%

- We reserve the right to make minor changes to this distribution of weights based on variations in assignments and instructor evaluation of course execution.
- A "C-" is considered passing for this course. Minor adjustments may be made in the determination of final letter grades and with grade cut lines shown below, but there is no "curving" in this course. This course uses the standard grading percentage cutlines shown above.
- 70% is the maximum for which the C- cutline will be set but may be set lower after instructor review of the course (never higher). **Students should not assume this baseline will be lowered for final grades.**
- For assignments designated as individual effort, using another student's work as your own, or allowing another student to use your work as their own is considered academic misconduct and will not be tolerated. If you are caught in any of these activities, you will be reported to the Honor Council and be subject to an academic penalty which may include failure of the course.
- **Final Exam:** The final exam for the course is comprehensive and will be taken during the common exam period and location assigned to this course. The final exam is scheduled for Friday, December 12th from 07:30 – 10:00 am.
- **Assignment Regrade Requests:** Regrade requests must be submitted to the professors within 1 week of the grade posting to Canvas. Regrade requests are only considered if you believe there was an error in the grading per the written rubric. Regrade requests are not to argue against the grading rubric, as we carefully design these for each exam.
- **Missed Exam / Assignment:** Make-up exams will not be granted unless for valid issues outside of student's control and prior coordination attempted (no later than 2 weeks prior notice). For valid issues that arise inside of 2 weeks of an exam, determination will be on a case-by-case basis by the instructors.
    - Example that DO NOT warrant a make-up exam include (but are not limited to):
        - Social Events / Family vacations
        - Club Activities
        - Travel arrangements for breaks (you must consider your academic calendar before making these arrangements)
    - Examples that DO warrant a make-up exam
        - Conflict with another course exam
        - Debilitating sickness or injury that prevents taking exam
        - Aerospace / Engineering conference or event participation where you are actively presenting or are part of a team that is actively participating.
        - Intercollegiate athletic competitions where you are an active team member.
    - A student who requests multiple missed exam make-ups during the course may be denied a make-up exam. **All make-up exams must be completed w/in 3 workdays from original exam date. No remote exam options will be provided unless physical attendance is not possible for make-up.**

- **Accommodation Requests:** Students should expect to receive accommodations for a timed assessment (e.g., exam) only if their faculty instructor(s) receives the student's accommodation letter at least 5 business days before the assessment, as a departmental policy, to facilitate administering the assessment. It is YOUR responsibility to communicate with your professor about any special accommodation needs, as per the instructions in your accommodation letter.
- **Use of AI in This Class:** Generative artificial intelligence tools—software that reproduces text, images, computer code, audio, video, and other content—have become widely available. This statement governs all such tools, including those released during our semester together. Keep in mind that the goal of gen AI tools is to reproduce content that seems to have been produced by a human, not to produce accurate or reliable content; therefore, relying on a gen AI tool may result in your submission of inaccurate content.
    - It is your responsibility—not the tool's—to assure the quality, integrity, and accuracy of work you submit in this course.
    - If gen AI tool use is suspected in completing assignments for this course in ways not explicitly authorized, I will follow up with you. I may contact the Office of Student Conduct & Conflict Resolution to report suspected Honor Code violations.
    - In addition, you must be wary of unintentional plagiarism or data fabrication. Please act with integrity, for the sake of both your personal character and your academic record.
    - In this course, you may use gen AI tools on specific assignments in this course, but their use is limited to the following particular tasks:
        - Grammer checks to assess student generated writing
        - Explanation of course provided code or help on code syntax
    - AI tools cannot be used for:
        - Writing bulk portions of report or code assignments
        - Generating ideas, outlines, or analysis
        - As a general guide, if your starting point is AI or the origin of any analysis is not your own mind, then you are not using it appropriately for this course as you are short-circuiting the development of your own thinking processes.
    - All final work must be student-generated, summarizing or synthesizing research, with proper critical evaluation and original analysis as outlined for each individual assignment.
    - If you use gen AI tools on assignments in this class, document your usage with the Chicago Manual of Style or appropriate citation guidelines for this course

Course Communication Policy:

- **General Course Help:** Students should ask questions about concepts, example problems given in the lecture videos, and homework assignments during the instructor's office hours or the Aerospace Study Halls that will be held throughout the week and supported by the course TFs. Students are strongly encouraged to participate in both these opportunities, even if they don't have specific questions about the material or the homework.
    - The course Canvas discussion page may also be used for questions at any time and will be moderated by the instructional team.
    - Do not send instructors or TA/TFs content related questions via email as it may not get seen or answered. Use the Canvas discussion page for asynchronous questions as your question may support other students with similar questions.
- **Schedule Changes:** We reserve the right to make changes to the weekly course schedule. We will give sufficient advance notice through announcements in class and posting on the web. Changes to this syllabus and assignments-table may be announced at any time during class periods. We will post the current syllabus and assignments-table on the web.
- **Course Announcements:** Canvas will be used to send out course-wide announcements, to provide comments to you daily on class activities, and to provide general information about course assignments.

University 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 contact the instructor of the course as soon as possible to coordinate how to mitigate impacts to your course accomplishment.**

Accommodation for Religious Obligations

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. Please communicate the need for a religious accommodation in a timely manner. In this class, **you are expected to review the course schedule, identify any religious conflicts, and contact the instructor to coordinate any mitigation strategies within the first two weeks of the semester.** See the campus policy regarding religious observances for full details.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information does not always align with how they identify. If you wish to have your preferred name (rather than your legal name) and/or your preferred pronouns 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.
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Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive 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- and off-campus. 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, reporting options, and OIEC support resources including confidential services can be found on the OIEC website.

Please know that faculty and graduate instructors are required to inform OIEC when they are made aware of incidents related to these concerns regardless of when or where something occurred. This is to ensure the person impacted receives outreach from OIEC about resolution options and support resources. To learn more about reporting and support a variety of concerns, visit the Don't Ignore It page.

Mental Health and Wellness

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS), located in C4C, or call (303) 492-2277, 24/7.