

ASEN 3712 – Spring 2026
Structures

Instructor:

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

Graded Exams Uploaded to: Gradescope, <https://gradescope.com>

Regrade requests: To be submitted to Canvas

Texts: TBD

Prerequisites: ASEN 2701, ASEN 2703, APPM 2350 or MATH 2400

Course Objectives: The main objective of the course is to introduce modern structural analysis techniques based on understanding of the development of internal forces, stresses and deformations. These are essential to the design and verification of advanced aerospace structures and systems. The course offers an introduction to matrix and finite element methods for skeletal (truss and frame) structures, as well as to fundamental concepts in energy methods and structural stability.

Major Course Topics & Schedule

Week	Topic
1	Syllabus; review fundamentals
2	Normal and shear stress; normal and shear strain
3	Mechanical properties & material laws
4	Material laws; general state of stress; 2D state of stress
5	Stress transformation; stress element
6	Stress transformation (Mohr's circle); Pressure Vessels
7	Review of torsion; torsion of non-circular sections
8	Torsion of non-circular sections; energy methods
9	Energy methods
10	Energy methods
11	Spring Break
12	Energy methods; column buckling
13	Column buckling
14	Finite element method
15	Finite element method
16	Finite element method; design problems

Course Grading

Exam 1	27.5 %
Exam 2	27.5 %
Exam 3	27.5 %
Homework	10.5 %
In-class activities	7 %
	<hr/>
	100 %

- Students must verify all scores and grades on Canvas within 1 week after they are posted; requests to change a score need to be made within this period.
- We reserve the right to make minor changes to this distribution of weights based on variations in assignments.

Course Delivery

The course will be in person unless campus instructional guidelines change.

Exam Policies

Students will take three exams during the semester at the regular class time, and location (AERO 120). The exams may consist of work out (free response) problems, and/or conceptual questions (T/F, multiple choice, short answer).

Tentative exam dates are as follows:

- Exam 1 Tuesday, February 10th
- Exam 2 Tuesday, March 10th
- Exam 3 Tuesday, April 14th

Final Exam

There is no final exam for this course, or no exam given during finals week.

Lecture

Lecture will be in person in AERO 120.

Office Hours

Students can ask questions about concepts, example problems, and homework assignments during office hours. The office hour schedule will be posted to Canvas within a week of the course starting. Students are strongly encouraged to attend office hours if they have questions about the lecture material or homework.

Evaluated Outcomes

The Department of Aerospace Engineering Sciences has adopted a policy of assigning grades according to evaluated outcomes in each course. Each assignment is designed and graded to assess some combination of several or a few of the following outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Important Notes

- Students should expect to receive accommodations for a timed assessment (e.g., exam) only if their faculty instructor(s) receive the student's accommodations letter at least 5 business days before the assessment, as a departmental policy, in order to facilitate administering the assessment.
- You should email your professor to schedule personal meetings. For example, if you experience a medical/family emergency, or you are struggling in the course and need to discuss success strategies.
- Please note in case of a medical/family emergency, you should contact the office of Student Support and Case Management here: <https://www.colorado.edu/studentaffairs/sscm> They will help you coordinate across ALL of your courses and can put you in touch with a number of campus resources.
- We reserve the right to make changes to the weekly course schedule and/or assignments (e.g., homework) based on events that require different dispositions. We will give sufficient advance notice through announcements in class and via Canvas.

- Please check the Canvas site regularly as important announcements related to assignments, inclement weather, etc. are posted on this website.
- Homework
 - Each homework set contains several problems and can sometimes include conceptual questions. Several problems are graded based on completion while one problem is graded in terms of accuracy. A specific format shall be followed for the homework assignment.
 - Homework assignments are to lead you through important applications of current material. Like learning a musical instrument or sport, you cannot become proficient in statics/mechanics by watching the instructor solve problems - you must practice on your own. Homework enforces the mental processes that help you to become proficient in a subject. Before beginning any homework assignment, you should review the course notes and example problems.
 - All homework assignments must be submitted through Gradescope. No hard copy submissions of the homework will be accepted.
 - The lowest homework score will be dropped.
- In-class activities
 - **Attendance is important!** We move rather swiftly through many topics, and you are expected to attend class regularly.
 - These activities are **unannounced** and are intended to provide students with an opportunity to work on problems in a group setting.
 - To receive credit, students must attend the lecture. **There are no makeups offered for these activities.**
 - These activities are graded mainly on completion in lieu of accuracy. Provided that you show up to class and are actively participating, full credit can be awarded.
 - If you have an unavoidable conflict, family/medical emergency which will prevent you from attending class, please reach out to the instructor. At the instructor's discretion, an exemption can be granted provided that enough notice was given.
 - **Please be proactive** (contact the instructor) when class(es) are missed, especially if you are out for an extended period of time. Please avoid contacting the instructor after a (zero) grade is posted to Canvas if an ICA was missed, asking for an exemption.
 - The lowest in-class activity shall score be dropped.
- Exams
 - Exams typically consist of conceptual questions (T/F, multiple choice, short answer) and free response problems with a time limit of ~70 minutes.
 - Usually about 1 week before an exam, a detailed announcement is posted to Canvas.
 - Exams shall be administered at the usual class meeting time in AERO 120.
 - For each exam students may bring in a single page (8.5" x 11"), front and back, of hand-written notes and equations. Worked out problems, copies of homework and old exam solutions are **not** permitted.
 - Permitted resources: calculator (bring your own, they are not provided), pens, pencils, erasers, ruler, or straight edge. Tablets, cell phones, and laptops are not permitted.
 - At the instructor's discretion, makeup exams may be given when an emergency or unavoidable conflict causes a student to miss the assessment.
 - All makeup exams must be completed within 1-2 business days from the original exam date.

- Following an exam, a regrade request (optional assignment) will be made available on Canvas. Submit a single pdf document to the ‘regrade request’ assignment on Canvas with the exam problem with your original work, your hand-written CORRECT solution to the problem in question, and a page stating the problem number, grading issue, and what you believe the correct grade should be.
- If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member 2 weeks prior to the exams so that your needs can be addressed. If we have your paperwork already and you have received an email with accommodations instructions, there is no need to email us. We will receive the notifications automatically. If you are waiting for the paperwork and it is delayed for some reason, please let us know via email.
- Extra credit opportunities
 - When exams 1 and 2 are returned students can submit an optional assignment where they are tasked to ‘self-grade’ the assessment.
 - Students go through the exam and essentially highlight, and re-work as needed, the portion of the exam that was incorrect. This exercise is an opportunity to review what was done incorrectly and learn from the mistakes.
 - If the assignment is completed, an additional three (3) bonus points will be added to the exam(s).
- Grading
 - Minor adjustments may be made in the determination of final letter grades and with grade cut lines, but there is no “curving” in this course.

Letter Grade	Percent Score
A	93.00-100
A-	90.00-92.99
B+	87.00-89.99
B	83.00-86.99
B-	80.00-82.99
C+	77.00-79.99
C	73.00-76.99
C-	70.00-72.99
D	60.00-69.99
F	Below 60.00

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 as early as possible.

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. 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.