

## ASEN 2701 – Fall 2024

### Introduction to Statics, Structures and Materials

#### Instructors:

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#### Teaching Assistants:

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

**Homework Site:** Mastering Engineering, linked through Canvas!

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

**Regrade requests:** To be submitted to Canvas

**Class Email List:** This is automatically done through Canvas.

**Texts:** R.C. Hibbeler, *Statics and Mechanics of Materials* (6<sup>th</sup>), Pearson, including Mastering Engineering site.

**Prerequisites:** APPM 1360 & PHYS 1110 or equivalent; CSCI 1300 or equivalent.

**Corequisites:** ASEN 2012; APPM 2350 or equivalent.

**Course Objectives:** Introduce the fundamental analytical tools for statics and structural analysis in the context of the physics of aerospace materials. Topics include force/moment equilibrium, truss analysis, beam theory, stress and strain, stiffness and strength of material, and aerospace structural design.

## Major Course Topics

1. Introduction to basic concepts of structures and materials
2. Forces, moments, equilibrium
3. Internal loads, distributed loads
4. Stress and strain
5. Stiffness, strength, and failure of materials
6. Truss analysis, method of sections, method of joints
7. Beam analysis, shear force and bending moment diagrams
8. Centroids and moments of inertia
9. Deformation in bending, bending stress
10. Shear stress in beams
11. Beam deflection
12. Torsion

## Grading Guidelines

Homework	15%
3 midterm exams (highest 2 grades are counted)	45%
Comprehensive final exam	35%
In-class activities	5%
	<hr/> 100%

- Please verify all your scores and grades on Canvas within 1 week after they are posted; requests to change a score need to be made within this period. All regrade requests should be submitted to Canvas folder as outlined in 'Important Notes' below.
- 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 3 midterm exams during the semester. The exams may consist of work out (free response) problems, and/or conceptual questions (T/F, multiple choice, short answer). The final exam is comprehensive.

Tentative exam dates are as follows:

- Exam 1 Thursday, September 26th
- Exam 2 Thursday, October 31st
- Exam 3 Thursday, December 5th

## Final Exam

The final exam is comprehensive. As we near the end of the semester, more details on specific exam topics shall be given.

The final exam will take place during the university-scheduled final exam time, which is Monday, December 16<sup>th</sup> from 7:30 am to 10:00 am. **Please mark this date on your calendars and plan your winter travels accordingly.**

**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 material or the homework.

## Evaluated Outcomes

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

- O1** Professional context and expectations (ethics, economics, etc.)
- O2** Historical perspective and vision
- O3** Multidisciplinary, system perspective
- O4** Written, oral, graphical communication ability
- O5** Knowledge of key scientific/engineering concepts
- O6** Ability to define and conduct experiments, use instrumentation
- O7** Ability to learn independently, find information
- O8** Ability to work in teams
- O9** Ability to design systems
- O10** Ability to formulate and solve problems
- O11** Ability to use and program computers

## Important Notes

- 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, or maybe to discuss your career goals. Emails will be responded to during business hours, i.e., Monday through Friday, 8:00 am – 5:00 pm. Any emails must include “ASEN 2701” on the Subject line. With respect to questions about the lecture material, homework problems, etc. students are encouraged to attend office hours in lieu of emails as it enables clarity and learning.
- 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 based on occurring events that require different dispositions. 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. Both are dated in the footnote.

- Canvas will be used to send out announcements, to provide comments to you daily on class activities, and to provide general information about course assignments.
- Homework
  - 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 us 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 book, lectures, and lecture examples.
  - All homework assignments must be submitted through Mastering Engineering on Canvas. No hard copy submissions of the homework will be accepted.
  - No late homework assignments will be accepted. You will have 1 week to complete each homework assignment. Please plan accordingly.
  - Homework is due on Wednesdays (see the course schedule on Canvas) at 11:59 pm.
  - At the end of the semester your lowest homework grade will be dropped.
  - Our preference is to avoid emailing the instructional team with questions about the homework and instead attend office hours in person as it is much easier to explain a concept or comment on your analysis.
  - Collaboration is permitted on homework. However, we strongly recommend to first work on your own on the homework before comparing your results with your homework team members. You may discuss the means and methods for formulating and solving problems and even compare answers, but you are not free to copy someone's assignment. Copying material from any resource (including solutions manuals) and submitting it as one's own is considered plagiarism and is an Honor Code violation. Remember, the less you think about the problems yourself, the less you learn, and the more difficult it will be to succeed on the graded assessments.
  - Homework solutions are posted shortly after the submission deadline.
- In-class activities
  - 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 be attending 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 shall be awarded.
  - The lowest in-class activity shall score be dropped.
- Exams
  - **No makeup exams are given in this class due to illness or any other reason.** Three midterm exams shall be given during the semester, and the lowest exam score will be dropped. For example, if a student earns a score of 90% on exam 1, 77% on exam 2, and 81% on exam 3, the grades of 90% and 81% shall be used in the computation of the overall course grade. In general, we will use this flexibility to allow for situations where students cannot take an exam due to an unavoidable schedule conflict or cannot take an exam due to illness or an emergency occurring on the exam date. If you have a schedule conflict with

the final exam, please notify the instructor as early as possible, so that an appropriate course of action can be taken.

- Regrade requests must be submitted to the professors in writing within 1 week of the grade posting to 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.
- 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

## **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.

For more information, see the [classroom behavior policy](#), the [Student Code of Conduct](#), and the [Office of Institutional Equity and Compliance](#).

## **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](mailto: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 instructional team.

## **Preferred Student Names and Pronouns**

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

## **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 in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: [StudentConduct@colorado.edu](mailto:StudentConduct@colorado.edu). Students found responsible for violating the [Honor Code](#) will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to

academic sanctions from the faculty member. Visit [Honor Code](#) for more information on the academic integrity policy.

### **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 [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about university policies, [reporting options](#), and [support resources](#) including confidential services can be found on the [OIEC website](#).

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

### **Religious Accommodations**

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.

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.

Free and unlimited telehealth is also available through [Academic Live Care](#). The Academic Live Care site also provides information about additional wellness services on campus that are available to students.