ASEN 2701 – Spring 2025

Introduction to Statics, Structures, and Materials

January 16, 2025

Instructor: Kurt Maute
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Teaching Assistants:

Maggie Lea	maggie.lea@colorado.edu
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Class Website: https://canvas.colorado.edu

Homework Site: Mastering Engineering, linked through Canvas!

Graded Exams Uploaded to: Gradescope, https://gradescope.com
Regrade requests need to be submitted to Canvas.

Announcements and Email: Announcements and emails are sent exclusively through Canvas. You are strongly encouraged to adjust your settings in Canvas to receive automatic notifications for course announcements.

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

Lecture: T/TR 02:30 PM - 03:45 PM, AERO 111. Recordings of the lectures will be provided on CANVAS after the lecture. However, if you are enrolled in the in-person section, you are strongly encouraged to attend lectures and participate in in-class activities.

Office hours:

Day	Time	Instructor	Location
Tuesday*	11:30 AM – 12:30 PM	Maggie Lea	AERO N253 Kitty Hawk Conference Room
Tuesday	5:30 PM – 7:00 PM	Danik Baskakov	Study Hall (AERO 111)
Thursday	5:30 PM – 7:00 PM	Sophie Obrien	Study Hall (AERO 111)
Friday	8:00 AM – 9:00 AM	Kurt Maute	AERO N353 Chawla Conference Room

* room not available 03/04; alternative location will be announced via CANVAS notifications

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

Homework (two lowest scores are dropped)	15%
3 Midterm exams (highest two grades are counted)	50%
Comprehensive final exam	35%

- Please verify all your scores and grades on Canvas within one 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 as outlined in 'Important Notes' below.
- We reserve the right to make minor changes to this distribution of weights based on variations in assignments.
- 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.

Midterm Exam

Students will take three midterm exams during the semester. The exams may include work out, computational problems, and/or conceptual questions (T/F, multiple choice, short answer). The final exam is comprehensive. All exams will be in AERO 111.

Exam dates:

- Exam 1 (2/13/2025)
- Exam 2 (3/13/2025)
- Exam 3 (4/17/2025)

Final Exam

Since many of the topics covered in the first half of the course (statics) are directly applicable to what is covered in the second half (solid mechanics), the final exam is comprehensive. As we near the end of the semester, more details on specific exam topics will be given.

The final exam will take place during the university-scheduled final exam time, which is Sunday, May 4th, from 4:30 pm–7:00 pm. Please mark this date in your calendars and plan your travels accordingly.

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 is 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, and 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

- The instructor reserves the right to reply to emails only during business hours, i.e. Monday through Friday, 8:00 am – 5:00 pm. You can expect a reply to emails within one business day. Emails should be exclusively on administrative and personal matters and not about technical questions; see notes below.
- You should email the instructor to schedule personal meetings. These meetings are exclusively to discuss personal matters, such as 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 your courses and can put you in touch with many campus resources.
- For questions about the lecture material, homework problems, etc. you should attend office hours instead of email as it enables clarity and learning. You are strongly encouraged to attend office hours if you have any technical questions.
- Canvas will be used exclusively to send out announcements, to provide comments to you daily on class activities, and to provide general information about course assignments.
- The instructor reserves the right to update the weekly course schedule based on events that require different dispositions. Sufficient advance notice will be given through announcements in class and posting on the web.
- 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 one week to complete each homework assignment. Please plan accordingly.
    - Unless stated differently in the assignment, homework is due on Wednesdays (see the course schedule on Canvas) at 11:59 pm.
    - Questions about homework problems should be asked during office hours in person as it is much more efficient to explain a concept or comment on your analysis.
    - Collaboration is permitted on homework. However, we strongly recommend that you 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.
    - No makeup homework is given in this class. The homework assignments with the two lowest scores will be dropped. This policy is meant to accommodate illness, family and medical emergencies, and other reasons that prevent you from submitting a homework assignment. In

situations where you miss submitting homework assignments more than twice, please, contact the instructor.

- Exams
  - No makeup exams are given in this class. Three midterm exams are 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% are 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 other emergencies occurring on the exam date. If you miss more than one exam, please contact the instructor. 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 instructor in writing within one week of the grade posting to Canvas. Submit a single pdf document to the 'regrade request' assignment on Canvas 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, you will receive accommodations as determined by Disability Services. If you have received an email with accommodations instructions, there is no need to email us. We will receive the notifications automatically and contact you about how we provide accommodation. See also note on *Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation* below.

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. 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.

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 your instructor so an appropriate plan of action can be formulated.

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, we provide additional flexibility in the grading policies for homework assignments and exams to accommodate religious obligations. Please contact the instructor.

See the campus policy regarding religious observances for full details.

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.

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.

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. 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 that individuals impacted receive outreach from OIEC about their options and support resources. To learn more about reporting and support for 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.

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.

Acceptable Use of AI in this Class

In this class, the use of AI tools is allowed to improve your understanding of the material but is disallowed to solve the problems posted in assignments.