

ASEN 2701 - Fall 2022

Introduction to Statics, Structures and Materials

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Teaching Assistants: TBD

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

Homework Site: Mastering Engineering, linked through Canvas!

Discussion Site: Canvas Bulletin Boards

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

Class Email List: This is automatically done through Canvas.

Texts: R.C. Hibbeler, *Statics and Mechanics of Materials* (5th ed.), 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

Group Work

Homework	15%
In-class Activities	5%

Individual Work

6 Quizzes	70%
Final Exam	10%
	<hr/> 100%

- AES department policy: group work grade only counts towards final grade if the total individual grade is C or better.
- Please verify all your scores and grades on Canvas within 2 weeks 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.

Quiz Times and Policies

Students will take 6 quizzes roughly every other Thursday throughout the semester. Each quiz will consist of a few conceptual questions (e.g., multiple choice) and 1 work-out, or computational, problem. Quizzes are 30 minutes long and will be given during lecture time.

- Statics Quizzes

- Quiz 1: September 8
- Quiz 2: September 22
- Quiz 3: October 6

- Mechanics of Materials Quizzes
 - Quiz 4: October 27
 - Quiz 5: November 10
 - Quiz 6: December 1

As students may use the final exam to replace up to 2 quizzes, no make-up quizzes will be granted.

Final Exam

The final exam will have two parts. One part is mandatory, the other part is optional. The mandatory part will have questions pertaining to topics covered near the end of the course (beam deflection and torsion).

The optional part of the final exam will consist of 6 questions, each one covering material from a different quiz. You will choose up to 2 questions to answer from the optional part. The optional part will be used to replace up to 2 quiz grades. If your score on a given final exam question is higher than your score for the corresponding quiz, your quiz score will be replaced with your score on that final exam question. If your score on a given final exam question is lower than your score for that quiz, your quiz score will remain unchanged.

The final exam will take place during the university-scheduled final exam time, which is Wednesday, December 14th from 7:30 AM to 10:00 AM MT.

Lecture: Lecture will be in person. Please note that 10:00 AM lectures will be recorded and can be viewed on Canvas.

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. Online Canvas discussion boards may also be used for any questions at any time and will be moderated by the instructional team.

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:

1. Questions regarding quizzes, course policies, lecture material, and homework must be directed to the appropriate Canvas discussion board. If we receive an email regarding one of these topics we will refer you to the Canvas discussion board.
2. Emails to the directly instructor should occur if you experience a medical/family emergency, or if you are struggling in the course and need to discuss success strategies. Emails will be responded to during business hours, i.e., Monday through Friday, 8:00 am – 5:00 pm. Students are encouraged to attend office hours in lieu of emails as it enables clarity and learning.
3. 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.
4. 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.
5. 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.
6. Why is homework important?
 - 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.
7. Homework:
 - 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.
 - At the end of the semester your lowest homework grade will be dropped.
 - No homework questions should be emailed to the instructional team—all questions should be asked at office hours or posted on the Canvas discussion board. The instructional team will not respond to posts that are posted after 5:00 pm the day before the homework is due.

- 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 actually learn, and the more difficult it will be to succeed on quizzes.
- Homework solutions are posted shortly after the submission deadline.

8. Quizzes:

- Makeup quizzes will not be granted for any reason. The final exam will be used for replacing up to 2 quiz grades per the policy stated above.
- Regrade requests must be submitted to the professors in writing within 2 weeks of the grade posting to Canvas. Submit a single pdf document to the 'regrade request' folder on canvas with: the quiz problem with your original work, your hand-written CORRECT solution to the quiz 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 quizzes 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.

9. In-Class Activities:

- 5% of the course grade is devoted to in-class activities. While these activities are unannounced, you can expect to see ~10-15 of them during the semester.
- As the name implies, you must attend class to receive credit. These activities typically consist of a mix of conceptual questions and problems to be solved in a group setting.
- The in-class activities shall be graded with respect to completion instead of accuracy. Provided that you attend class and are actively participating, full credit shall be awarded.
- At the end of the semester, the lowest in-class activity grade shall be dropped.

10. 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.
- To receive a course grade of C or better (which is required to fulfill the prerequisite for ASEN2003 and other courses), students must receive a C or better in the individual coursework portion of the class. Stated differently, the students who receive an individual grade of C- or lower will not receive any group grades.

CU Campus-Wide Syllabus Policies

Classroom Behavior

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail 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, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Conduct & Conflict Resolution policies](#).

Requirements for COVID-19

As a matter of public health and safety, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. CU Boulder currently requires COVID-19 vaccination and boosters for all faculty, staff and students. Students, faculty and staff must upload proof of vaccination and boosters or file for an exemption based on medical, ethical or moral grounds through the MyCUHealth portal.

The CU Boulder campus is currently mask-optional. However, if public health conditions change and masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct and Conflict Resolution. For more information, see the policy on classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

If you feel ill and think you might have COVID-19, if you have tested positive for COVID-19, or if you are unvaccinated or partially vaccinated and have been in close contact with someone who has COVID-19, you should stay home and follow the further guidance of the Public Health Office (contacttracing@colorado.edu). If you are fully vaccinated and have been in close contact with someone who has COVID-19, you do not need to stay home; rather, you should self-monitor for symptoms and follow the further guidance of the Public Health Office (contacttracing@colorado.edu). {Faculty: insert your procedure here for students to alert you about absence due to illness or quarantine. Because of FERPA student privacy laws, do not require students to state the nature of their illness when alerting you. Do not require "doctor's notes" for classes missed due to illness; campus health services no longer provide "doctor's notes" or appointment verifications.}

Accommodation for Disabilities

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.

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 academic integrity policy. Violations of the Honor Code may include, but are not limited to: plagiarism, 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. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found on the [Honor Code website](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by or against members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or email cureport@colorado.edu. Information about OIEC, university policies, [reporting options](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about their rights, support resources, and reporting options.

Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. See the [campus policy regarding religious observances](#) for full details.