

ASEN 2001 - Fall 2020
Introduction to Statics, Structures and Materials

- Instructors:** Kathryn Wingate, PhD (Statics)
She/her
Email: kathryn.wingate@colorado.edu
Lab Sections: 12:50 – 2:40 pm (**303**, 307, 311)
3:00 – 4:50 pm (**304**, 308, 312)
- Aaron Johnson, PhD (Mechanics of Materials)
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Lab Sections: 8:30 – 10:20 am (**301**, 305, 309)
10:40 am – 12:40 pm (**302**, 306, 310)
- Lab Coordinator:** Trudy Schwartz
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- Teaching Assistants:** Victoria Kravets: victoria.kravets@colorado.edu
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- Class Website:** log on to <https://canvas.colorado.edu>
- Lab Section Zoom Site:** <https://cuboulder.zoom.us/j/91427234884>
- Homework Site:** in Canvas!
- Piazza Site:** In Canvas!
- Quiz / Lab Submission Site:** Gradescope, <https://gradescope.com>
- Course Playlist:** In [Spotify](#)! (seriously)
- Class Email List:** This is automatically done through Canvas.
- Texts:** R.C. Hibbeler, *Statics and Mechanics of Materials* (5th ed.), Pearson, Online through Canvas, [including Mastering Engineering site](#).
- Prerequisites:** APPM 1360 & PHYS 1110 or equivalent; CSCI 1300 or equivalent.
Corequisites: ASEN 2012; APPM 2350 or equivalent.

Required Equipment

- A way to turn written work into a PDF. This could be a tablet computer on which you write electronically, or a scanner smartphone app (such as CamScanner or Scannable) to scan in handwritten work on paper.
- A computer microphone or a phone would be very beneficial to participate in group work.

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. MATLAB programming will be required for homework and laboratory assignments.

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 moment diagrams.
8. Moments of inertia.
9. Beam deflection
10. Torsion.

Grading Guidelines

Group work:	3 Open-ended Modeling Problems (Labs)	30% (10% each)
	Homework	10%
Individual:	6 Quizzes	60% (10% each)
		<hr/> 100%

- Group work 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

Guidelines use the following definitions:

- In-Person (Synchronous): activity in person on campus on scheduled days and times.
- Hybrid (Synchronous): rotating in-person schedule.
- Remote (Synchronous): activity via Zoom or other real-time platform on scheduled days and times; students will need to participate in activity or complete assignment at a specified time.
- Online (Asynchronous): activity via lecture capture or Canvas online; students can participate when it is convenient for them within a specified time window.

Class	Class Delivery	Notes
Lecture	Online (Asynchronous)	Online videos posted to Canvas. Recommend watching the day of or before the scheduled lecture.
Quizzes	Remote (Synchronous)	Quizzes occur during scheduled lecture time and will be submitted via Canvas and Gradescope.
Final Exam (Optional)	Remote (Synchronous)	The final exam will occur during scheduled time, and will be submitted via Canvas and Gradescope.
Office Hours	Remote (Synchronous)	Offered over Zoom, and will occur during lecture time.
Lab	Hybrid Remote (Synchronous)	Offered over Zoom and will occur during scheduled lab time. You also need to work with your assigned lab team outside of lab hours to complete assignments. If public health orders allow, some optional pedagogically meaningful in person activities may occur starting mid-September.

No portion of the course will require you to attend in-person. Pedagogically meaningful in-person activities will be made available following the guidance of the Colorado Department of Public Health and CU Boulder administration but participation in those activities will not be required. Furthermore, given the current state of the pandemic, at this time we do not anticipate any in-person activities occurring until late September at the earliest. Please note that while the CU Class Search website states that AERO 120 is reserved for some of the lecture meetings, there will be no required in-person lecture meetings.

If you cannot meet a component of the course delivery system, or you need an all-online, asynchronous experience (not able to meet weekly scheduled lectures or labs even remotely), please reach out to Dr. Wingate and Dr. Johnson as soon as possible.

Online Learning Protocol

The Zoom meeting environment is a professional one—this includes expectations for your conduct, attire, and environment. Please refer to the “AES Lab and Group Work Protocol” document for more details. Here are some highlights:

- 1) Please use your preferred full name when you join the Zoom session. Do not use any usernames or “nicknames” that don’t represent your real name.
- 2) Please mute yourself when you are not talking to avoid distracting the rest of the class.
- 3) If you feel comfortable turning your camera on during office hours and lab, you are encouraged to do so. However, students will not be required to show video of themselves during any part of the class. If you choose to have your camera turned off, we would appreciate you putting a picture of yourself as your Zoom profile picture to help us connect your face to your name!

- 4) You will be able to fully participate in the class without having a webcam. You will be able to ask questions during office hours and lab through voice (by using the “Raise Hand” feature in Zoom) or through chat.
- 5) This course is a professional space. If you are not in an office-like setting, we recommend that you use a virtual background if your computer allows. Please wear attire that you would wear to class if we were meeting in person.
- 6) Be engaged and responsive during the meeting. Don’t be afraid to speak or use chat, especially if the meeting is small. Your feedback and engagement are essential to the communication that takes place in a meeting.

Quiz Times and Policies

Instead of exams, students will take 6 quizzes Remotely every other Thursday throughout the semester. Each quiz will consist of a few multiple choice questions and 1 work-out problem. Each quiz will open at 9:15 am MDT/MST and will close at 10:35 am MDT/MST. The quiz will be available as a Canvas quiz, and once you start the quiz you will have a half hour to submit your final answers to Canvas. You will then have until 11:00 am MDT/MST to scan and submit your handwritten work to Gradescope. You will not be given credit for the work-out problem without submitting this work, even if you enter the correct answer in Canvas. If you have the wrong final answer, this work will be used to give you partial credit.

- Statics Quizzes
 - Quiz 1: September 10
 - Quiz 2: September 24
 - Quiz 3: October 8
- Mechanics of Materials Quizzes
 - Quiz 4: October 22
 - Quiz 5: November 5
 - Quiz 6: November 19

As students may use the final exam to replace up to 3 quizzes, no make-up quizzes will be granted.

Final Exam

The final exam is optional: students are not required to take the final exam and the final exam will not be counted towards your grade on its own. The final exam will be used to replace up to 3 quiz grades. The final exam will consist of 6 questions, each one covering material from a different quiz. You will choose up to 3 questions to answer. 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:

- Optional Final Exam: Thursday, December 10, 7:30 – 10:00 am MST

Lecture: The primary mode of lecture will be pre-recorded videos provided by your instructors via a link through Canvas. These videos are an Online, asynchronous component of the course delivery system in addition to your reading and homework activity.

Office Hours: Students can ask questions about concepts, example problems given in the lecture videos, and homework assignments Remotely via Zoom during office hours that will be held during the scheduled lecture times (Tuesday and Thursday, 8:30 - 11:30 am). Students are strongly encouraged to participate in office hours, even if they don't have specific 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.

Office hours will be held in the same Zoom meeting as lab section meetings:

<https://cuboulder.zoom.us/j/91427234884>

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. Emails will be responded to during business hours, i.e. Monday through Friday, 8:00 am – 5:00 pm. Emails regarding quizzes or lab assignments which are received 24 hours or less before the quizzes or lab report deadlines will not be responded to. Students are encouraged to attend office hours in lieu of emails as it enables clarity and learning.
2. All homework questions must be posted to the Piazza discussion board. If we receive an email with a homework question, we will direct you to the Piazza discussion board.
3. 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.
4. 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.
5. Why have homework, lab exercises, and quizzes?
 - 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.

- You are responsible for concepts introduced in labs on quizzes.
- The labs this year are Open-ended Modeling Problems (OEMPs), which Dr. Johnson has been using and researching in his structures courses and since 2018. These OEMPs help you learn how to model real-world systems—such as a ski lift, playground slide, or wing spar beam—with the formulas and techniques taught in class. Like the name suggests, OEMPs have no single correct answer and focus more on making and justifying assumptions. Each OEMP will have an individual portion to start you thinking about the problem and a group portion where you will discuss the problem and gain experience in working and cooperating in groups. Group members must inform the instructional team early on if a teammate is not participating. Your lab grades will be from a “Lab Check” assessment on Canvas that covers material from the individual portion, the submitted group assignment, and an anonymous peer evaluation of the team members.

6. Homework:

- All homework questions must be submitted to the Piazza discussion page under the appropriate homework assignment/question. No homework questions should be emailed to the instructional team—all questions should be asked at office hours or posted on Canvas. 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. Teams of up to three students are permitted. Groups may change during the semester. 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.
- At the end of the semester your lowest homework grade will be dropped.
- No late homework assignments will be accepted. You will have 1 week to complete each homework assignment: Please plan accordingly.
- All homework assignments must be submitted through Mastering Engineering on Canvas. No hard copy submissions of the homework will be accepted.
- Homework solutions are posted shortly after the submission deadline.

7. Quizzes:

- Makeup quizzes will not be granted for any reason. The final exam will be used for replacing up to 3 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.

8. Labs:

- Lab meetings will be conducted Remotely. Therefore, ALL students are expected to join live during their scheduled lab sessions. This will ensure that students have an opportunity to hear the lab introductions, work in small groups on the lab assignments, ask questions about the lab assignments, take short lab quizzes, and participate in debriefs at the conclusion of each assignment. The course schedule will provide a summary of lab topics, duration of the lab, and lab deliverables.
- In addition to these Remote meetings, students will work in groups on lab assignments outside of class time in a Remote, In-person, or Online fashion with synchronous or asynchronous group meetings at the discretion of and organization by the lab group. Resources and tools to help facilitate group efforts will be provided on the course Canvas page. Group formation will be defined prior to the lab introduction and will attempt to account for an individual's situation such as time-zone differences or access to high speed internet for synchronous activities.
- Students can ask questions about lab assignments Remotely via Zoom during the normal scheduled lab dates and times, or during office hours.
- 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 or CSCI 1300. We will not teach computer programming, although we will make an effort to formulate the assignments to emphasize proper computing skills. In this class, we will exclusively use the programming language MATLAB. 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/>.
- Lab documents will be provided in advance of the labs, which provide a detailed description of various steps and milestones in each lab. You are required to carefully study the lab documents before the beginning of each lab section. These lab documents will also include guidelines for the individual and group work that needs to be submitted for each lab.
- Students are encouraged to submit lab questions to the Piazza discussion page under the appropriate lab number and check/participate in the ongoing discussions. As with the homework, you may discuss the means and methods for formulating and solving problems but you cannot compare answers on Piazza nor post your exact work or computer code.

9. 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.

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 Code of Conduct](#).

Requirements for COVID-19

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible,
- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders,
- clean local work area,
- practice hand hygiene,
- follow public health orders, and
- if sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert [CU Boulder Medical Services](#).

Students who fail to adhere to these 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 policies on [COVID-19 Health and Safety](#) and [classroom behavior](#) and the [Student Code of Conduct](#). If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the “Accommodation for Disabilities” statement on this syllabus.

Before returning to campus, all students must complete the [COVID-19 Student Health and Expectations Course](#). Before coming on to campus each day, all students are required to complete a [Daily Health Form](#).

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home and complete the [Health Questionnaire and Illness Reporting Form](#) remotely. In this class, if you are sick and will miss a quiz or lab, please e-mail both Dr. Wingate and Dr. Johnson with “2001” at the beginning of your e-mail title (e.g. “2001: Missing Lab on Monday”). You are not required to state the nature of your illness. If you will miss meetings for other sophomore courses (2002 and/or 2012), it would be helpful to e-mail all of your 2000-level instructors together so that we all know of your absence.

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. Violations of the policy may include: 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 at the [Honor Code Office 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 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 cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and 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 options for reporting and support resources.

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. In this class, excused absences for labs on religious holidays need to be communicated to the instructor via email 2 weeks ahead of the expected absence. See the [campus policy regarding religious observances](#) for full details.