

ASEN 3113: Thermodynamics and Heat Transfer Fall 2023

Lecture Time/Location: Section 010 - M/W/F 3:00 pm – 3:50 pm AERO 120

Instructor:

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Office Hours:

11:00 AM-12:00 PM on Mon at AERO 232
11:15 AM-12:15 PM on Tue at AERO 232
9:00 AM-10:00 AM on Wed at AERO 232
5:30 PM-7:00 PM on Tue at AERO 120, 111, N100 (Study Hall)
5:30 PM-7:00 PM on Thur at AERO 120, 111, N100 (Study Hall)

Course Link:

<https://canvas.colorado.edu/>

Slack Link:

Email Policy: It is our intent to make ourselves as accessible as possible to you during this semester within the bounds of other responsibilities. In general, we will do our best to accommodate student needs and respond as promptly as possible to e-mails. We will reply to email questions only in business hours, i.e., Monday through Friday, 8:00 am – 6:00 pm. Emails received 24 hours or less before the exams are not guaranteed a response. We may also reply all (to the entire class) if the questions/answers are deemed to benefit others in the class (the identities of the questioners are not to be revealed). In your email, please identify yourself by providing the course number (**ASEN 3713**) in the subject line and your name at the start of the message. However, all technical questions

on course content should be asked during lecture, or during office hours. One-on-one meetings with the instructor will only be scheduled to address individual administrative or academic issues.

Text: McGraw Hill Connect: Cengel, *Fundamentals of Thermal-Fluid Sciences, 5th Edition*.

Prerequisites: ASEN 2002 or equivalent.

Introduction: This course follows ASEN 2002 and covers the Second Law of Thermodynamics, Entropy, Power/Energy Cycles and Heat Transfer (conduction, convection, and radiation). The emphasis will be on understanding the basic physical principles associated with these topics and developing the student's ability to solve numerical problems associated with them.

Course Objective: Given regular class attendance, reading of assigned text material in preparation for quizzes, careful and comprehensive completion of all assignments, students should be able to: (1) understand the general concepts of thermodynamics and heat transfer in order to develop an intuitive grasp of the subject matter; (2) develop an ability to apply these basic concepts to engineering analysis and design problems.

Course Reading and Assignments: The textbook will be followed closely but some additional material may be introduced to broaden a particular subject. This material will be distributed to the class. Students are expected to read the assigned textbook section in time to prepare for both in class discussion and for quizzes given approximately every week. Homework assignments will be weekly or bi-weekly.

Quizzes: Quizzes will be conducted on **Canvas**. Students will take quizzes on their own time after the Wednesday lecture but before the following Monday lecture. Once a quiz is started, students have 15 minutes to finish it, and the student is given only one attempt on the quiz. Quizzes cover previous lectures and reading assignments. There will be no make-up opportunity for quizzes since the lowest three will be dropped.

Exams: There will be three 50-minute-long mid-term exams and a final exam. All mid-term exams will be in-class and cover the material between it and the previous exam. All exams are close book. but you are allowed to have one single-sided 8.5x11 page crib notes for your first exam. However, for mid-term exams 1, 2, 3 and the final exam you are allowed to have quantity of 1, 2, 3, and then 4 single-sided 8.5x11 pages of crib notes, respectively, meaning 1-page crib notes accumulatively for each exam. Always bring a calculator. Thermodynamic Tables will be provided to you for the exams. Make ups for exams are extremely difficult to accommodate. There will be no unexcused exam make-ups provided. If you miss an exam, the course instructor will evaluate each case (e.g., medical emergency) on an individual basis based on the context and information available to decide if a make-up exam will be provided. Students are encouraged to provide as much documentation as possible to enable an informed decision. If necessary, the instructor may choose to use your existing grades to cover your missed grade(s).

Course Schedule: The specific weekly course schedule (lectures, exams, assignments) will be posted to Canvas.

COURSE GRADING AND POLICIES

Our grading scheme is designed to indicate your level of competency compared to the standards set by the AES faculty. Do you meet the minimum level of competency? Do you exceed the minimum? Are you below the minimum? This should be indicated by the final grade. We (the faculty) are professionals and it is our job to set and maintain standards. We are expected to use our education, experience, and interactions with industry, government laboratories, others in academia, etc., to determine the contents of these standards. Because our program is accredited by ABET (Accreditation Board for Engineering and Technology), the AES curriculum meets or exceeds that board's standards. As with any other professionals (doctors, lawyers, etc.) you must trust that we know what we are doing and that we are obliged to uphold standards.

The final grade indicates your readiness to continue to the next level of courses. Meeting the minimum requirements indicates that you are prepared to continue, at least at the minimum level required for the next sequence of courses. Exceeding the minimum means you are ready to enter the next course and that you have mastery of material beyond the minimum, i.e., you show some level of proficiency. This course consists of several graded components, with your final grade determined by the following breakdown:

Grade Breakdown:

Reading/lecture quizzes (<~10 min each; drop the lowest 3)	20%
Three Mid-term Exams (Exam 1: 12%, Exam 2: 13%, Exam 3: 15%)	40%
Homework*	20%
Final (TBD)	20%

*Group effort only counts toward final grade if total individual grade is C or better

Homework Grading Scheme:

$HW(\text{Score}/30) = 10\text{pts (random } P1) + 10\text{pts (random } P2) + 10\text{pts (\# of remaining problems completed)/(\# of remaining problems assigned)}$

Grading Notes:

- This class is not graded on a curve; there are absolute expectations of performance. However, we reserve the right to normalize and adjust the class grades based on the highest performance in the class. This process will not lower a person's grade.
- Any grade question/dispute must be resolved within two weeks after the grade is posted. This will avoid undue complications at the end of the semester when final grades are being determined. As for the final exam and final grade, any question/dispute will be resolved during the first week of the next semester (not during the break). There are certain due processes to be followed.
- In order to continue on ASEN core courses, a minimum grade of C is required.

Important Notes

1. Attendance in person of all lectures is expected. All classes will be video recorded and made available through Canvas; however, this is meant to provide an opportunity to review a past lecture while they are studying or if a lecture is missed by the student due to an emergency.
2. Always have a calculator for lectures.
3. Expect new material to be presented in the lectures.
4. Why have reading assignments, homework, and various quizzes?
 - Reading assignments are to be completed before the lecture/discussion. The lecture/discussions should help to clarify and supplement what you have read.
 - Homework assignments will cover material from lectures. Homework enforces the mental processes that help you to become proficient in a subject. In addition, homework may encourage you to learn other material not included in lectures.
 - Reading quizzes provide a gauge to determine what you have learned independently from the assigned reading.
5. All assignments must be submitted to **Gradescope** in an appropriate format (PDF, .m, etc.). Homework must be submitted before class begins on the day that it is due.
 - All individual submissions must follow the convention:

LastName, FirstName_AssignmentName, for example: Smith, John_HW1

6. Always submit work in a professional form. Neatness, clarity, and completeness count. If submitted work is not legible, you may not receive full credit. Please review before and after submitting. It is your responsibility to make sure the submission is complete.
7. Late assignments will not be accepted. If you know in advance that you must miss a homework due date for a legitimate reason, send the relevant Instructors/TA/TFs an e-mail to make an exception and special arrangements. We expect students to be professional by attending class and submitting assignments on time.
8. Collaboration is permitted on homework. This means you may discuss the means and methods for solving problems, even compare answers, but you are not free to copy someone's assignment. The work that you turn in must be your own--copying is not allowed for any assignments. Collaboration on quizzes and exams, or using another student's work or allowing another student to use your work is academic misconduct.

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

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 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 Student Conduct & Conflict Resolution (honor@colorado.edu); 303-492-5550). 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. 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

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, protected-class discrimination and harassment, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these policies, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, [reporting options](#), and support resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of any issues related to these policies regardless of when or where they occurred to ensure that individuals impacted receive information about their rights, support resources, and resolution options. To learn more about reporting and support options for a variety of concerns, visit [Don't Ignore It](#).

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, students need to inform the instructor in advance if they need accommodation.

See the [campus policy regarding religious observances](#) for full details.