

ASEN 3113: Thermodynamics and Heat Transfer, Fall 2020

Lecture Time/Location: Section 010 – Mon/Wed 11:30 am -12:45 pm AERO 120

Lab Time/Location: Section 012 - Th 2:30 - 4:20 pm AERO 141
Section 011 - Fri 10:30 am -12:20 pm AERO 141

Instructor:

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Office Hours: 9-10:30 am on Th and 9-10:20 am on Fri at AERO 245

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Lab Manager:

Ms. Trudy Schwartz

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Teaching Assistant (TA):

Elise Rimsa, TA

Office Hours: 8:30-9:30 am on Wednesday at AERO 303 Onizuka Conference Room
(except for September 18th: at AERO 403 Born Conference Room)

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Teaching Fellows (TFs):

Lara Buri

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Emanuele (Emmi) Costantino

Office Hours: 11:30 am – 1:00 pm on Tuesday AERO N353 Chawala Conference Room
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Lab Assistants (LAs):

Lara Lufkin

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Cody Goldman

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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. Experiments will be carried out to help the student gain experience with the systems representing these principles.

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 design problems.

Course Structure: 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.

Exams: There will be 3 hour-long mid-term exams and a final exam. All hour-long 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, and you are allowed to fill out the other side of the same crib sheet for your second exam, and so on. Always bring a calculator. Thermodynamic Tables will be provided to you for the exams. After the hour-long exams are graded and returned we will go over them to resolve any issues that were particularly problematical to the class. There will be no make-up for exams and quizzes. **Acceptable excuses**, such as medical certification of an emergency, are required to make up any exam and a Doctor's note is required. (There will be no make-up opportunity for quizzes since two are dropped).

GRADING

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 academe, etc., to determine the content 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.

Grade Breakdown According to Assignments: Your final grade is determined according to the following percentage breakdown:

Reading/lecture quizzes (~10 min each; drop the lowest two)	5%
Clicker quizzes (random; drop the lowest two)	5%
Three Mid-term Exams (8% each)	24%
Experimental Labs (2 reports, 10% each)*	20%
Design Lab (1 power point presentation)*	8%
Homework*	15%
Final (1:30 p.m. – 4:00 p.m. on December 18)	23%
	100%

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

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 at the beginning of the next semester (**not during the break**). There are certain due processes to be followed.

Important Notes

1. We reserve the right to 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 also reserve the right to 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). To better help us manage and track your emails, from the junk and clutter that we receive on a daily basis, please include **ASEN3113** at the beginning of the subject line.

2. Teamwork and lab performance will be obtained from peer evaluation and from the faculty and TA/TF/LA observation of the student's participation in labs. **The peer evaluation is due the same time as each Lab report and will count for 10% of each Lab report grade (Lab report grade = 0.9*group grade + 0.1*peer evaluation score).**

3. The scheduled laboratory hours will be used for both experimental and design lab projects. These lab hours should be used for course work even when no formal supervision is present.

4. Attendance to all lectures and laboratory workshops is expected.

5. Always have a calculator for both lecture/laboratory sessions. Access to the current online textbook may prove useful but should not be done if it leads you or your neighbor's distraction.

6. Expect new material to be presented in both the "lectures" and the "laboratory" hours.

7. Why have reading assignments, homework, lab exercises, design project, 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 both material from lectures and material assigned but not covered in 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 or laboratories.

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

- Experimental laboratory exercises are either more complex than hands-on homework or require special equipment. You will work in teams and are required to submit a team laboratory report and one page or less your individual discussion about the lab.
- Design project helps you to learn how to synthesis the basic concepts, methods, and tools presented in the course curriculum. The team-oriented approach will give you experience in working and cooperating in groups.
- Reading quizzes at the beginning of class provide a gauge to determine what you have learned independently from the assigned reading. Lecture quizzes, at the end of class, cover the previous days' and/or the same day's lecture. Clicker quizzes, another way to measure what you have learned, increase your retention what was taught, and facilitate discussion and peering teaching. Always bring your clicker and calculator (and your text book too) to the classroom.

8. Safety is the number one priority for laboratory exercises. You are expected to attend PILOT lab orientation to get door and computer access.

9. All assignments must be submitted to Canvas in pdf form only:

- Homework must be submitted before class begins on the day that it is due.
- Pre-lab and Experimental Lab Reports must be submitted before lab begins on the day that it is due.

All individual submissions must follow the convention:

LastName, FirstName_AssignmentName, for example: Smith, John_HW1

For group Exp Lab Report submission, please follow the convention:

Lab#_Group#_Thu or Lab#_Group#_Fri

10. 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 submitting.**

11. Late assignments will not be accepted. If you know in advance that you must miss a homework due date or lab, send the relevant Instructors/TA/TFs an e-mail to make arrangements. We expect students to be professional by attending class and submitting assignments on time.

12. 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.

13. 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.

In order to continue on ASEN core courses, a minimum grade of C is required.

Other Important Notes

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 or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

Classroom Behavior

Students and faculty each have responsibility for maintaining an appropriate learning environment. 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. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

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 who are 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 a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct intimate partner abuse (including dating or domestic violence), stalking, 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, 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, students who have such a conflict should inform the instructor at the beginning of the semester after the class schedule is announced/distributed.