

ASEN 2002
Introduction to Thermodynamics and Aerodynamics
Fall 2017

Lecture Time/Location: Section 010 (All)– Tuesday/Thursday 9:30-4:45pm MATH 100

Laboratory Time/Location: Section 011 –Wednesday 8-9:50am ITLL 2B10
Section 012 –Wednesday 10-11:50am ITLL 2B10
Section 013 –Wednesday 1-2:50pm ITLL 2B10
Section 014 – Wednesday 3-4:50pm ITLL 2B10

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Overflow Lab Period: T/Th 12:30-2:00pm

Teaching Assistants:

Daniel Bateman	Alfredo Cruz	Arvind Dudi	Joel (Gabe) Funtanilla
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Hours: F 10-11:30am	Hours: M 10-11:30am	Hours: M 3-4:30pm	Hours: F 1-2:30pm
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Class WebSite: <https://learn.colorado.edu/>

Required Texts: McGraw Hill Connect: Cengel Fundamentals of Thermodynamics, 5th Edition.
Anderson, Introduction to Flight, 8th edition.

Prerequisites: APPM 1360, CHEM 1211/1221, PHYS 1110 or equivalent, GEEN 1300 or equivalent
Corequisite: APPM 2350 or equivalent, ASEN 2001

Required Equipment: Safety glasses, bound lab notebook. i.e. the pages are NOT removable, numbered pages are optional

Course Objective: Introduce the fundamental concepts and principles of thermodynamic and fluid dynamic systems. The focus is in areas of general importance to the aerospace engineering discipline. The primary goal is the synthesis of basic science (physics), mathematics, experimental ~~tools~~ for quantitative and qualitative analyses and design of general aerospace technology systems.

Topical Outline:

1. Basic concepts of thermodynamics
2. Conservation of energy: the First Law of Thermodynamics
3. Properties of pure substances
4. Control Volume Analysis
5. Introduction to basic concepts of aerodynamics
6. One-dimensional incompressible flows
7. One-dimensional compressible flows
8. Two-dimensional flows: lift and drag
9. Introduction to viscous flows

Grading

We do not grade on a "curve". Our grading scheme is not assigned to reward or punish. It is designed to indicate your level of

2. It is in your best interest to regularly check your grades once posted to D2L. Grade disputes must be resolved within two weeks of posting to D2L. This will avoid undue complications at the end of the semester when final grades are being determined.
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 may be announced at any time during class periods. We will post the current syllabus and assignments on the web. Both are dated in the footnote.
4. Always have a calculator for both lecture/discussion and laboratory sessions. Access to the current online textbook may prove useful but should not be done if it leads to your or your neighbors' distraction.
5. Attendance to all scheduled lecture/discussion and laboratory periods is expected. In addition to announced unit quizzes, random unit quizzes may be given during any lecture/discussion or laboratory session. Like the scheduled quizzes and exams, there are no makeups. We may normalize quiz grades at the end of the semester (not guaranteed).
6. Expect new material to be presented in both the lecture/discussion and laboratory periods. Quizzes and exams cover all material in the course including lecture/discussions, homework, and experimental and design laboratory work.
7. Why have reading assignments, homework, lab exercises, exams, and design projects?
 - € Reading assignments are to be completed before the lecture/discussion. The lecture/discussions should help to clarify and supplement what you have read.
 - € Homework reinforces the mental processes that help you to become proficient in a subject. In addition to the assigned homework, we encourage you to work additional problems for practice. Before beginning any homework assignment, you should read the text and work the examples in the text. Homework, which is graded in the category of "group work", may be discussed with the TA and fellow students. Copying is not acceptable and the HW must be a representation of your own understanding of the material.
 - € Experimental laboratory exercises are either more complex than homework or require special equipment (such as a wind tunnel). You will work in teams but may be required to submit individual experimental laboratory reports.
 - € Design projects help you to learn how to synthesize 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. A portion (up to 20%) of the total design lab grade will be from anonymous peer evaluation by team members.
8. Exams and quizzes provide a gauge to determine independently what you have learned. Exams will be administered during lecture time and the allotted final exam period. Tentative dates for the exams are Sept 2, Oct 17, Nov 14 and Dec 20. The exams are cumulative within each of the topic areas of thermodynamics and aerodynamics, weighted to reflect this. Specifically exams 1 and 3 are weighted at 10% and exams 2 and 4 are weighted at 15% of the overall grade.
9. Guidelines for Experimental and Design Labs will be handed out at the time they are assigned. Each lab assignment will include a grading rubric for you to use in preparation of your reports.
10. Lab reports must be submitted electronically to the appropriate dropbox on D2L. The report must be in pdf format.

problem on its own page and do not use the back of the page. This will help the TAs distribute and grade your HW. Your name (last, first), assignment number, and due date should be visible on the outside in the upper portion of each page. Written work must be neat and readable with adequate spacing and margins. You are responsible for legibility. Legibility reevaluation will be granted. Very messy work will be returned to you ungraded and a score of zero recorded. Final

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20. The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student.