

Thermodynamics

EML 3100

Section 2433 MWF 10:40 - 11:30 am

Section 27G7 MWF 1:55 - 2:45 pm

Section 3645 MWF 3:00 - 3:50 pm

Instructor:

Teresa Benitez

tbg1984@ufl.edu

Cell 787-403-7504

Office Hours: Tuesdays, Thursdays and Saturdays 2 - 3 pm on Zoom
By appointment at any other time.

Teaching Assistant(s):

- Marilyn Braojos
 - Mbraojos26@ufl.edu
 - 786-702-4967
 - Office hours: MWF 11:00 am - 12:00 pm on Zoom
- Kyle Rubin
 - fortheawesome@ufl.edu
 - Office hours: MWF 6:00 - 7:00 pm on Zoom

Course Description

Credits: 3. Application of the first and second laws of thermodynamics to closed and open systems and to cyclic heat engines. This includes the development of procedures for calculating the properties of multiphase and single-phase pure substances.

Course Pre-Requisites / Co-Requisites

Pre-requisites: CHM 2041, CHM 2045, MAC 2313 and PHY 2048.

Course Objectives

Students will learn thermodynamics concepts, such as control mass and control volume analyses, evaluation of thermodynamic properties, application of conservation of mass and conservation of energy, the second law of thermodynamics, entropy, and analysis of power and refrigeration cycles.

Professional Component (ABET):

- Engineering science: 90%
- Engineering design: 5%
- Engineering/mathematical analysis: 5%

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. Apply knowledge of mathematics, science, and engineering	High
b. Design and conduct experiments, as well as analyze and interpret data	
c. Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
d. Function on multidisciplinary teams	Low
e. Identify, formulate, and solve engineering problems	High
f. Understand professional and ethical responsibilities	Low
g. Communicate effectively	Medium
h. Understand the impact of engineering solutions in a global, economic, environmental, and societal context	High
i. Recognize the need for and be able to engage in lifelong learning	Medium
j. Understand contemporary issues	Medium
k. Use the techniques, skills, and modern engineering tools necessary for engineering practice	High

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

Announcements

- A weekly announcement will be posted on Canvas every Sunday or Monday, depending on the schedule for that week. Any additional urgent announcements may be posted by the instructor or a TA, and/or brought up during lecture.

Required textbook

- Title: Thermodynamics: An Engineering Approach
- Author: Cengel and Boles
- Publication date and edition: 2018, 9th Edition
- Low cost option: Opt in using UF All Access program

Lecture videos and notes

- All lectures will be recorded and shared on the cloud on Canvas.
- Some lectures may be synchronous/live (Zoom). These recordings will be posted, as well.
- Lecture notes generally will **not** be posted, unless the instructor finds it necessary.

Quiz dates and information (85%)

- **Dates**
 - September 22
 - October 8
 - October 27
 - November 12
 - November 24
 - December 9 (last day of class)
- Quizzes 1 and 2 will be worth 10% of the grade each.
- Quizzes 3,4 and 5 will be worth 15% of the grade each.
- Quiz 6 will be worth 20% of the grade each.
- **All quizzes will be with open notes, and “take-home”. They will be posted on the dates posted above at 6pm (EDT) and will be due within 6 hours.**
- Submissions will be submitted through the Canvas website.
- Make sure that your submissions are **clear**. If we cannot understand your handwriting and/or procedure, and/or if you do not follow the instructions for each quiz, you will lose points.
- Late submissions will be accepted with the following penalties (out of 50 points):
 - Up to 15 minutes late: - 10 points
 - 15 - 30 minutes late: - 20 points
 - 30 - 45 minutes late: -30 points
 - 45 - 60 minutes late: -40 points

Attendance policy and make-up policy

- Attendance is not mandatory. All lectures will be recorded. **Students are held responsible for the material and announcements made during lecture.**
- Regrade requests must be submitted within a week after a paper or problem set has been returned to you. Regrade requests will be made directly to the instructor.
- Make-up exam requests will be considered by the instructor.

Project (15%)

- **Preliminary information for projects will be posted by the first week of classes.**
- **Final information for projects will be posted by the second week of classes.**
- The options for projects are:
 - Literature review research paper (groups of 2 students)
 - Steam engine build from scratch (individual -- this is easier than it sounds!)
 - Steam tables coding (groups of 2 students)
 - Oral presentations (groups of 3 students) on one of these topics (topics beyond what we cover):
 - Real gases analysis
 - Pressure drop inside a pipe
 - Heat transfer mode: convection
 - Heat transfer mode: radiation
 - The components and analysis of a simple vapor compression refrigeration cycle
- All projects will be due by November 19 at midnight.
- Early submissions by November 10 get 5 additional points (out of 100).
- Sign-up for projects will be on September 12 (Saturday) at 9:00 am (on Canvas).

Recommended problems

- There is no homework in this course.
- Recommended practice problems will be posted on Canvas, with separate solution files posted at the same time. The solutions have extended commentary to help you.

Evaluation of Grades

Assignment	Percentage of Final Grade
Project	15%
Quizzes	85%
	100%

Grading Policy

Percent	Grade	Grade Points
92.0 - 100	A	4.00
89 - 91.9	A-	3.66
86.0 - 88.9	B+	3.33
82.0- 85.9	B	3.00
79 - 81.9	B-	2.66
76.0- 78.9	C+	2.33
70.0 - 75.9	C	2.00
67.0 - 69.9	D+	1.33
60.0 - 66.9	D	1.00
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Online Course Recording

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:

<http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.