

EML 3100 Thermodynamics

Section 4594, Course #13324

Class Periods: Tu (5th & 6th): 11:45am -12:35 pm; 12:50pm-1:40pm

Th (6th): 12:50pm-1:40pm

Location: Weil 270

Academic Term: Fall 2021

It may become necessary to modify this syllabus during the semester. In this event, students will be notified, and the revised syllabus will be posted on the course web site.

COVID-19

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the [UF Health Screen, Test & Protect website](#) for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

Instructor:

Dr. Roger TRAN-SON-TAY

rtst@ufl.edu

Office Hours: Tuesdays, Thursdays 2 - 3 pm

By appointment at other times.

Teaching Assistant:

- Alexander Browder
abrowder1@ufl.edu
Office Hours: Tuesday & Thursday: 9am - 11am
- Nathan Mackey
nathanmackey@ufl.edu
Office Hours: From Monday to Thursday: 4pm – 5pm

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 Online Resources: E-Learning/CANVAS system (<https://lss.at.ufl.edu/>)—all documents, homework, grades, etc. will be posted on this system.

Course Topics:

Chap 1 Introduction/Basic Concepts	Chap 6 The Second Law of Thermodynamics
Chap 2 Energy Fundamentals	Chap 7 Entropy
Chap 3 Properties of Pure Substances	Chap 9 Gas power Cycle
Chap 4 Energy Analysis of Closed Systems	Chap 10 Vapor Power Cycles
Chap 5 Mass and Energy Analysis of Control Volumes	

Course Objectives

This course provides an intermediate level coverage of thermodynamics. 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):

A. EML 3100 supports several program outcomes enumerated in the Mission Statement of the Department of Mechanical and Aerospace Engineering. Specific ME program outcomes supported by this course include: (1) Using knowledge of chemistry and calculus based physics with depth in at least one of them (**ME Program Outcome M1**); (2) Using knowledge of advanced mathematics through multivariate calculus and differential equations (**ME Program Outcome M2**); (3) Being able to work professionally in the thermal systems area (**ME Program Outcome M4**).

B. Engineering Science (100%)

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. an ability to communicate effectively with a range of audiences	
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	High
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

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

Required Textbooks and Software

- Title: Thermodynamics: An Engineering Approach, 9th Edition
- Author: Cengel, Boles, and Kanaglu
- Publication: Mc Graw Hill, 2019

Lecture and notes

- Lectures will be recorded and posted on Canvas.
- Lecture notes will **not** be posted, unless the instructor finds it necessary.

Exam dates and information

- All exams will be closed notes. They will be given during class hours.
- If a student scores more than 80/100 in **each** of the *four midterm exams*, *review paper*, **and** *HW*, he/she may be excused from the final exam. In that case, exams will count for 65% of the final grade.

Attendance Policy and Make-Up Policy

- Attendance is strongly recommended. Irregular attendance always results in poor or mediocre performance. It is expected that 3 to 5 study hours for each contact hour are to be spent every week studying for this class. If a week is missed, the study hours need to be made up in the following weeks.
- **Students are held responsible for the material and announcements made during lecture.**
- Homework problems will be assigned via Canvas and submitted through Canvas. **No email or hard copy submissions will be accepted.** Only two problems will be graded at random. Homework papers will not be returned, but a correct solution will be posted on Canvas. You may upload homework assignments early, but not past the due date. The assignments will be due at the beginning of class on the due date. After that, the system will stop accepting the assignments. Late homework is not accepted via any other means.
- Each quiz will count as 1 set of homework.
- **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 Policy:** **There will be no make-up exams.** Unless there is a **documentable extreme medical emergency**, no credit will be given for a missed exam. It is the student's responsibility to make sure he/she is available to take the exam. **All four midterm exams will be given during class hours.**

Evaluation of Grades

Assignment	Percentage of Final Grade
HW & Quizzes	20%
Review Paper	15%
Exams (4)	45%
Final Exam	20%
	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 who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, 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.ua.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/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

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 Conduct Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

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: <https://registrar.ufl.edu/ferpa.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: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

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://career.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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

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