

EML 3100 - Thermodynamics, Spring 2025 (Updated: March 5, 2025)
4th Period, 10:40-11:30am, (Florida Gym 220, Section 132B) MWF

Instructor

Dr. S.A. Sherif
Department of Mechanical and Aerospace Engineering
1064 Center Drive, NEB Room 235
Gainesville, FL 32611
Tel (352) 392-7821, sasherif@ufl.edu
<https://mae.ufl.edu/people/faculty/primary/profiles/sa-sherif/>
Office Hours: MWF 2:30-3:30pm on Zoom (or as announced in Canvas)

Graders: There are four graders, but they are not allowed to provide TA help. Contact Dr. Sherif directly.

Catalog 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.

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

Course Objectives: This course provides an intermediate level coverage of thermodynamics. Students will learn concepts such as system and control volume analyses, evaluation of thermodynamic properties, application of conservation of mass, energy, and the second law of thermodynamics, the use of entropy, the application of availability and irreversibility to engineering problems, and analysis of power and refrigeration cycles.

Materials and Supply Fees: N/A

ABET Student Outcomes

This course achieves the following ABET outcomes [note that the outcome number corresponds to the respective ABET outcomes (1) through (7)]:

- (1) **Outcome 1**: Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (**High**)
- (2) **Outcome 3**: Ability to communicate effectively with a range of audiences (**Low**).
- (3) **Outcome 4**: 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 (**Low**).
- (4) **Outcome 7**: Ability to acquire and apply new knowledge as needed, using appropriate learning strategies (**Low**)

Meeting Times: 10:40-11:30am MWF(4th Period)

Class/Laboratory Schedule/Homepage: No lab

Homepage: **Students have access through E-Learning with Canvas**

Meeting Location: Florida Gym 220

Required Textbooks and Software Required: Fundamentals of Thermodynamics, 7th or 8th Editions, C. Borgnakke and R. Sonntag, John Wiley and Sons, Inc. (Make sure you have a hard copy book during the exams. Loose pages are not allowed unless they are permanently bound. Three-ring binding is not acceptable but spiral binding is). **Do not get the International Student Edition as it does not have all the appendices needed.**

Recommended Reading: None

Course Outline

Course Schedule and Assignments: Exams 1, 2, and 3 are scheduled in the evening

Section numbers below are based on the 7th Edition

Date	Topic	Date	Topic
Jan 13	2.1 to 2.5	March 12	9.1, 9.2
Jan 15	2.6 to 2.12	March 14	9.3, 9.4
Jan 17	3.1 to 3.3	March 17	Spring Break
Jan 20	Martin Luther King Holiday	March 19	Spring Break
Jan 22	3.4 to 3.6	March 21	Spring Break
Jan 26	3.7 to 3.10	March 24	9.5, 9.6
Jan 29	4.1 to 4.3	March 26	EXAM 2 (Chapters 6, 7, 8)
Jan 31	4.4 to 4.6	March 28	10.1, 10.2
Feb 3	4.7 to 4.9	March 31	10.2 (continued)
Feb 5	5.1 to 5.3	April 2	11.1 to 11.3
Feb 7	5.4 to 5.5	April 4	11.4 to 11.5
Feb 10	5.6 to 5.7	April 7	11.6 to 11.7
Feb 12	5.8 to 5.10	April 9	11.8 to 11.9
Feb 14	6.1 to 6.4	April 11	11.10 to 11.12
Feb 17	6.5 to 6.6	April 14	12.1 to 12.3 (Project 2 Due)
Feb 19	EXAM 1 (Chapters 2, 3, 4, 5)	April 16	12.4 to 12.6
Feb 21	7.1, 7.2		
Feb 24	7.3, 7.4	April 18	12.7 to 12.9
Feb 26	7.5 to 7.7	April 21	EXAM 3 (Chapters 9, 10)
Feb 28	7.8 to 7.10	April 23	12.10 to 12.12
March 3	8.1 to 8.4	April 24	Reading Days
March 5	8.5 to 8.8	April 25	Reading Days
March 7	8.9, 8.10 (Project 1 Due)	May 1	Final Exam (12:30-2:30pm FL Gym 220)
March 10	8.11 to 8.13		(Final Exam is comprehensive)

Locations, Dates, and Times of Midterm Exams:

Date	Room	Period	Time
February 19	220 FL Gym	4 th & 5 th	10:40am-12:35pm
March 26	220 FL Gym	4 th & 5 th	10:40am-12:35pm
April 21	220 FL Gym	4 th & 5 th	10:40am-12:35pm

Attendance Policy, Class Expectations, and Make-Up Policy

The lecture videos on Canvas are supplementary materials and start from the coverage of Entropy. They will help you get more out of the course if you watch all of them or watch a portion of them. On the other hand, the in-person lectures cover the whole course. If you miss an in-person lecture make sure you watch the corresponding topic on video. Office hours will be on Zoom. There will be some help sessions on Zoom especially before the exams. These "help sessions" will be recorded. It is extremely important that students attend the class regularly. Irregular attendance always results in poor or mediocre performance. **Policy on Homework Assignments:** 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. A correct solution will be posted on Canvas. You may upload homework assignments early, but not past the due date. The assignments can be submitted until 11:59pm on the day the assignments are due. Late homework is not accepted via any other means. **Policy on exams:** There will be three midterm exams (20% each) and a Final Exam (25%) of the course grade. The Final Exam will be given during Finals Week in the time slot specified by the University. All exams will be in person. The Final Exam is comprehensive. Each midterm exam will cover a portion of the course material as specified in this syllabus. **No make-up exams will be given unless there is an extreme and documented emergency.**

All exams are open book and closed notes. Make sure you have a hardcopy book or print your eBook and bind it. You will need it during the exams (3-ring binding is not acceptable. All other types of binding are acceptable).

Miscellaneous Policies

Students will be held responsible for knowledge of all scheduling and policy announcements made in class. You may call Dr. Sherif or send him an e-mail 24 hours a day, 7 days a week at 352-392-7821. Please make sure you leave a phone number if you call and cannot find him. If you send an Email, please also list a phone number where you can be reached. Dr. Sherif will return your call within a few hours. Sending an Email along with the voice message can also help alert him to your request. Excused absences are consistent with university policies in the undergraduate catalog at the following URL: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>
Excused absences require appropriate documentation.

Pre-recorded Help Sessions

There are 20 pre-recorded help sessions (Labeled E1 through E20) on Canvas that students are strongly encouraged to watch. These lectures cover Entropy (Chapter 8 in the 7th Edition) through the end of the course. These 20 lectures have lots of solved problems that will teach you how to apply the concepts in different situations. There are also two substitute lectures (labeled Substitute Lectures 1 and 2) that I will be letting you know when to watch.

Grading

Homework	7%
Project 1	3%
Project 2	5%
Exam #1	20%
Exam #2	20%
Exam #3	20%
Final Exam	25%
Extra credit	up to 3% (see details on the last page of the syllabus)

Grading Scale

A	90-100		
A-	86-90	B+	82-86
B	78-82	B-	74-78
C+	70-74	C	66-70
C-	62-66	D+	58-62
D	54-58	D-	50-54
E	0-50		

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.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.bluer.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 Honor 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. 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.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status. 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 Undergraduate Coordinator
- HWCoe Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@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://elearning.ufl.edu/>.

Career Connections 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://seccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>;
<https://distance.ufl.edu/state-authorization-status/#student-complaint>.

Virtual Exchange Extra Credit Opportunity

The MAE Department is offering a six-week Virtual Exchange (VE) opportunity under the supervision of Dr. Matthew J. Traum. This hands-on learning experience uses portable lab kits to explore flow phenomena underlying hydroelectric dam operation. UF students will collaborate with engineering undergraduates from Aswan University in Egypt to run experiments, analyze data, and produce written and video reports.

Format

- Remote via Zoom
- Optional in-person attendance in MAE-C-010

Class Meeting Schedule

- March 11 & 13, 2025
- March 25 – April 22, 2025 (after Spring Break)
- Meets Tuesdays & Thursdays, 9:35–10:25 am (Period 3)

Deliverables

- Complete four lab experiments, producing written or video reports with Egyptian collaborators
- Submit a short research summary on a selected hydroelectric facility

Extra Credit

Up to a 3% increase in the overall average of EML3100 will be given based on the performance in VE (Dr. Traum's course). The VE is scored out of 100 points:

- 100–90 points in Dr. Traum's course provide 3% extra credit added to the EML 3100 overall average
- 89.9–80 points in Dr. Traum's course provide 2% extra credit added to the EML 3100 overall average
- 79.9–70 points in Dr. Traum's course provide 1% extra credit added to the EML 3100 overall average
- Below 70 points: No extra credit

How to Enroll

To participate, students must enroll in the 0-credit ENG 4912 Egypt Virtual Exchange Independent Study with Dr. Traum. Enrollment forms and lab kits will be distributed during an in-person information session on March 11, 2025, at 9:35 am in MAE-C-010.

For questions, contact Dr. Traum at mtraum@ufl.edu.