EML 3100 – Thermodynamics - Fall 2026

Instructor:

Dr. Saeed Moghaddam
Department of Mechanical and Aerospace Engineering
Office: NEB 237
Phone: 352-392-0889
E-mail: saeedmog@ufl.edu

Teaching Assistants:

Aryanna Williams, a.williams7@ufl.edu
Adrian Garcia, Adrian.garcia@ufl.edu
Caleb Singh, calebsingh@ufl.edu

Class Hours and Locations:

M-W-F, Period 2 (8:30 - 9:20 AM), MAE-A 303

Office Hours and Location:

<table>
<tr><th>Time</th><th>Monday</th><th>Tuesday</th><th>Wednesday</th><th>Thursday</th><th>Friday</th></tr>
<tr><td>8:30-9am</td><td></td><td rowspan="3">A. Williams (NEB 526 or 299)</td><td></td><td rowspan="3">A. Williams (NEB 526 or 299)</td><td></td></tr>
<tr><td>9-9:30am</td><td></td><td></td><td></td></tr>
<tr><td>9:30-10am</td><td rowspan="2">Moghaddam (NEB 237)</td><td></td><td rowspan="2">Moghaddam (NEB 237)</td></tr>
<tr><td>10-10:30am</td><td></td><td></td><td></td></tr>
<tr><td>10:30-11am</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>11-11:30am</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>11:30am-12pm</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>12-12:30pm</td><td></td><td></td><td rowspan="3">C. Singh (NEB 526 or 299)</td><td></td><td rowspan="3">A. Garcia (NEB 526 or 299)</td></tr>
<tr><td>12:30-1pm</td><td></td><td></td><td></td></tr>
<tr><td>1-1:30pm</td><td></td><td></td><td></td></tr>
<tr><td>1:30-2pm</td><td></td><td rowspan="3">A. Garcia (NEB 526 or 299)</td><td></td><td rowspan="3">A. Garcia (NEB 526 or 299)</td><td></td></tr>
<tr><td>2-2:30pm</td><td></td><td></td><td></td></tr>
<tr><td>2:30-3pm</td><td></td><td></td><td></td></tr>
<tr><td>3-3:30pm</td><td></td><td></td><td></td><td rowspan="3">C. Singh (NEB 526 or 299)</td><td rowspan="3">A. Williams (NEB 526 or 299)</td></tr>
<tr><td>3:30-4pm</td><td></td><td></td><td></td></tr>
<tr><td>4-4:30pm</td><td></td><td></td><td rowspan="2">Moghaddam (NEB 237)</td></tr>
<tr><td>4:30-5pm</td><td></td><td></td><td></td><td rowspan="3">C. Singh (NEB 526 or 299)</td></tr>
<tr><td>5-5:30pm</td><td></td><td></td><td></td><td></td></tr>
<tr><td>5:30-6pm</td><td></td><td></td><td></td><td></td></tr>
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Course Pre-Requisites and Co-Requisites:

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

Course Description:

This course introduces the fundamental principles of classical thermodynamics and their application to engineering systems. The course begins with essential definitions and concepts, including thermodynamic systems and control volumes, properties, states, phases, equilibrium, processes, and cycles. The First Law of Thermodynamics is introduced as the conservation of energy principle and applied to closed systems and control volumes to analyze energy transfer by heat and work. Additional topics include thermodynamic properties of pure substances and ideal gases, mass and energy analysis of steady-flow devices, and an introduction to the Second Law of Thermodynamics and entropy. Emphasis is placed on physical understanding, clear problem formulation, and application of thermodynamic principles to practical engineering devices such as turbines, compressors, pumps, heat exchangers, and basic power and refrigeration systems.

Course Objectives:

Upon successful completion of this course, students will be able to:

1. Define fundamental thermodynamic concepts, including systems, control volumes, properties, states, phases, equilibrium, processes, and cycles.
2. Distinguish between intensive and extensive properties and evaluate specific properties relevant to engineering analyses.
3. Apply the First Law of Thermodynamics as a statement of energy conservation for closed systems and control volumes, accounting for heat, work, and energy storage terms.
4. Determine thermodynamic properties of pure substances and ideal gases using property tables, charts, and appropriate equations of state.
5. Perform mass and energy analyses of steady-flow engineering devices, including nozzles, diffusers, turbines, compressors, pumps, and heat exchangers.
6. Apply the Second Law of Thermodynamics to determine the direction of processes and evaluate entropy changes for systems and control volumes.
7. Analyze basic power and refrigeration cycles using thermal efficiency and coefficient-of-performance metrics.
8. Formulate and solve thermodynamics problems in a structured and physically consistent manner, clearly stating assumptions, control volumes, governing equations, and conclusions.

ABET Student Outcomes:

This course contributes to the following ABET Student Outcomes, with the level of emphasis indicated in parentheses:

Outcome 1 (High): Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

Outcome 3 (Low): Ability to communicate effectively with a range of audiences.

Outcome 4 (Low): Ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that consider the global, economic, environmental, and societal impacts of engineering solutions.

Outcome 7 (Low): Ability to acquire and apply new knowledge as needed using appropriate learning strategies.

Required Textbook and Software:

Title: Thermodynamics An Engineering Approach
Authors: Yunus A. Cengel, Michael A. Boles, and Mehmet Kanoglu
Edition: 10th
ISBN: 978-1-266-66448-9

Course Website: https://ufl.instructure.com/courses/553983

Homework, Exams, and Grading:

Homework assignments will be posted at least one week in advance and are due by **midnight on Fridays**.

Show all work, mark all answers, and be neat.

Online assignment and submission (email or hard-copy submissions are not accepted)

SOME collaboration is allowable on homework, but each student is responsible for performing the bulk of his or her own homework assignment.

Exams:

Exam 1: Friday, February 13th (8:25am to 9:25am)
Location: MAE-A 303

Exam 2: Friday, March 13th (8:25am to 9:25am)
Location: MAE-A 303

Exam 3: Friday, April 10th (8:25am to 9:25am)
Location: MAE-A 303

Final Exam (comprehensive): Thursday, April 30th (7:30am to 9:30am)
Location: MAE-A 303

All exams are closed book and closed notes. A standardized set of thermodynamic property tables and approved reference material will be provided with each exam. No additional reference materials are permitted.

No make-up exams will be given unless there is a valid reason consistent with the University policy.

Grading Basis:

Homework	10%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Final Exam	30%
Total	100%

Grading scale:

90-100	A
87-89.99	A-
83-86.99	B+
80-82.99	B
77 - 79.99	B-
73 - 76.99	C+
70 - 72.99	C
67 - 69.99	C-
63 - 66.99	D+

Holidays:

January 19^{th} (Monday)
March 16^{th}- 20^{th} (Spring break)

Class Policies:

1. Regular class attendance is strongly encouraged. Students who do not attend class consistently typically experience difficulty mastering the material and perform poorly on exams.
2. Cell phones must be silenced and not used during class.
3. Students are expected to be respectful of their classmates and avoid distracting behaviors. Food is not permitted in the classroom; covered beverages are allowed.

Artificial Intelligence (AI) Use Policy

This course is designed to develop foundational understanding of thermodynamic principles and systematic problem-solving skills. Students are expected to use standard course tools—including lectures, the textbook, homework, and office hours—to learn and apply the material.

The use of generative AI tools (e.g., ChatGPT or similar systems) to solve, complete, or substantially assist with graded assignments or exams is not permitted in this course. Students must complete all submitted work independently and demonstrate their own understanding of the concepts and methods.

Students may use AI tools for general study support, such as clarifying definitions, reviewing prerequisite material (e.g., calculus or basic physics), or improving writing mechanics for non-technical text, provided such use does not replace their own problem formulation or solution process.

The skills developed in this course are essential for advanced engineering analysis. While AI tools may be useful in future coursework or professional practice, mastery of core thermodynamics concepts without reliance on AI is an explicit learning objective of this class.

Violations of this policy will be treated as academic misconduct in accordance with university guidelines.

Academic Honesty

All students admitted to the University of Florida have signed a statement of academic honesty committing them to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action.

This statement is a reminder to uphold your obligation as a student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.