

Instructor: Robert P Smith
Office: TBD
Phone: 940-315-0450
Email: Robert.Smith@unt.edu
Lecture Time: Tuesday & Thursday 3:25 - 4:45 pm room F183
Instructor Office Hours: T/Th 1:45 – 3:15 pm or by appointment.

TA: TBD

TA Office Hours: TBD

Required Textbook: M. J. Moran and H. N. Shapiro, Fundamentals of Engineering Thermodynamics, any edition

Course Description:

Thermodynamics is a **fundamental mechanical engineering course** for lower-level undergraduate students. This course will provide basic skills and knowledge to solve various **classical macroscopic** thermodynamic engineering problems. Specifically, throughout this course students can:

- (1) Understand the basic concepts of thermodynamic properties including temperature, pressure, volume, enthalpy, entropy, internal energy, and specific heat
- (2) Understanding the concept of work and energy transfer by heat
- (3) Apply the first law of thermodynamics and understand the concept of energy
- (4) Apply the control volume concept to analyze engineering systems such as turbines, heat exchangers, pumps, etc.
- (5) Apply the second law of thermodynamics to analyze the thermodynamic cycle performance

Pre-requisites:

MEEN students: must complete Math 1720, Phys 1710, and MEEN 1000 with a grade of C or better.

MEET students: must complete CHEM 1410, CHEM 1430 and ENGR 2332.

Course Learning Outcomes (CLO):

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

1. Demonstrate ability to formulate the first and second law of thermodynamics;
2. Demonstrate ability to identify, formulate, and solve engineering problems;
3. Understand concepts of the First Law of Thermodynamics;
4. Understand the concept of work and energy transfer by heat;
5. Understand concepts of the Second Law of Thermodynamics;
6. Demonstrate ability to evaluate and work with thermodynamic properties;
7. Demonstrate ability to use control volume analysis for various engineering applications.

ABET Student Learning Outcomes (SO)

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
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;
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.

MEEN 2210 CLO	ABET EAC Student Outcomes						
	1	2	3	4	5	6	7
i	X						
ii	X			X			
iii	X						
iv	X						
v	X						
vi	X						
vii	X						

Grades:	Homework	10%	$\geq 90\%$	A
	Attendance	5%	80-89.9%	B
	Quizzes	15%	70-79.9%	C
	Midterm Exams	40%	60-69.9%	D
			< 60%	F
	Final	30%		
	Total	100%		

Homework:

- (1) Please turn in your homework on the due date before the specified time on Canvas (online submission). You can submit a hard copy in-person. **But NO late homework will be collected.**
- (2) Definition of “late”: when the homework is turned in after the specified time on due date.

- (3) Having no textbook is not a valid excuse for not doing your homework. It is the student's responsibility to acquire textbooks for his/her study.
- (4) Exceptions (late homework may be collected): medical emergency (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. Evidence must be submitted.
- (5) Homework can be turned in before the due date.
- (6) Homework may be turned in by email (not preferred). In this case send the scanned copy to TA.

Exam:

- (1) Exams are closed book and closed notes with formula sheets.**
- (2) The final exam is comprehensive.**
- (3) Formula sheets can be maximum 1 page (for Midterm) or 3 pages (for Final), letter size, **single** side.
- (4) Each student is responsible for preparing his/her own formula sheets.
- (5) Formula sheets could include anything BUT: solutions to homework or examples. Students who failed to follow this rule will score zero in the exam and this cheating matter will be reported to the department and university.
- (6) Formula sheets may be turned in with the exam papers. You will have it returned with graded exams.
- (7) There will be NO make-up exams. Exceptions:** medical emergency (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. Evidence must be submitted.

Disability Accommodations: If you need academic accommodations for disability, you must have document which verifies the disability and makes you eligible for accommodations, then you can schedule an appointment with the instructor to make appropriate arrangements.

Academic Dishonesty:

There is a zero-tolerance policy for academic dishonesty. Cheating of any kind whatsoever will result in an automatic 'F' in this course and the matter will be turned over to the appropriate student disciplinary committee.

IMPORTANT EXAM DATES

Quizzes and midterm exams: The date (TBD) will be announced during the class.

See tentative schedule on the next page.

Final exam: Monday Dec 7, 2025 (3:30 pm – 5:30 pm)

Schedule Overview (Subject to change)

Week	Date	Topic	HW Due
#1	Aug 18 - Aug 20	Lec. 1: course overview, introductory concepts (Ch. 1) Lec. 2: units, temperature, pressure, density (Ch. 1)	No HW
#2	Aug 25 – Aug 27	Lec. 3: energy, work, power (Ch. 2) Lec. 4: energy transfer, 1 st law of thermodynamics (Ch. 2)	TBD
#3	Sep 1 – Sep 3	Quiz 1 (1/28), Review of Ch. 1 and part of Ch. 2 Lec. 5: 1 st law of thermodynamics, power cycles (Ch. 2)	TBD
#4	Sep 8 – Sep 10	Lec. 6: basic concept of thermodynamic properties (Ch. 3) Lec. 7: determining the state, retrieving data (Ch. 3)	TBD
#5	Sep 15 – Sep 17	Lec. 8: more examples for retrieving data (Ch. 3) Lec. 9: specific heats and ideal gas (Ch. 3)	TBD
#6	Sep 22 – Sep 24	Lec. 10: (more) examples of the 1 st law of thermodynamics (Ch. 3) Midterm 1	No HW
#7	Sep 29 – Oct 1	Lec. 10: (more) examples of the 1 st law of thermodynamics (Ch. 3) Lec. 11: control volume analysis, mass & E balance (Ch. 4)	TBD
#7	Sep 29 – Oct 1	Lec. 11: control volume analysis, mass & E balance (Ch. 4) Lec. 12: applying 1 st law to complicated systems (Ch. 4)	TBD
#8	Oct 6 – Oct 8	Lec. 13: applying 1 st law to complicated systems (Ch. 4) Lec. 14: integrated system analysis (Ch. 4)	TBD
#9	Oct 13 – Oct 15	Lec. 15: introduction to entropy (Ch. 5) Quiz 2 (TBD)	TBD
#10	Oct 20 – Oct 22	Lec. 16: interpretation of 2 nd law statements (Ch. 5) Lec. 17: quality and efficiency of energy usage (Ch. 5)	TBD
#11	Oct 27 – Oct 29	Lec. 18: entropy concepts, evaluating entropy (Ch. 6) Lec. 19: entropy balance for closed system (Ch. 6)	TBD
#12	Nov 3 – Nov 5	Lec. 21: entropy balance for open system (Ch. 6) Lec. 22: using ideal gas for entropy evaluation (Ch. 6)	TBD
#13	Nov 10 – Nov 12	Lec. 23: energy efficiency for an integrated system (Ch. 6) Lec. 24: more examples of 2 nd law (Ch. 6)	No HW
#14	Nov 17 – Nov 19	Midterm 2 (TBD) Lec. 20: entropy concepts	TBD
#15	Nov 24 – Nov 28	Thanksgiving break (no class)	TBD
#16	Dec 1 – Dec 3	Lec. 25: course review Pre Final Week, course review	TBD
#17	Dec 7	Final Exam on Dec 7 3:30 pm – 5:30 pm (Comprehensive)	No HW