

UNIVERSITY OF NORTH TEXAS – Mechanical and Energy Engineering
MEET 3990 **APPLIED THERMODYNAMICS**
SYLLABUS Fall 2025 3 Credit hours

Instructor: Dr. Hassan Qandil (hassan.qandil@unt.edu)
Office Hours: By appointment via Zoom.
Lecture & Location: TuTh, 4:00 pm to 5:20 pm, NTDP B192
Teaching Assistant: TBD
TA Office Hours: TBD

Pre-requisite:

Must complete CHEM 1410, CHEM 1430 and ENGR 2332 with a grade of C or better.

Catalog 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, pump, etc.
- (5) Apply the second law of thermodynamics to analyze the thermodynamic cycle performance

Required Text:

“Fundamentals of Engineering Thermodynamics”, 9th edition (2020), M.J. Moran, H.N. Shapiro, D.D. Boettner, M.B. Bailey. Wiley, ISBN: 978-1119721437.

ABET Criteria:

Upon completion of this course, the student should be able to:

- Demonstrate ability to formulate the first and second law of thermodynamics;
- Demonstrate ability to identify, formulate, and solve engineering problems;
- Understand concepts of the First Law of Thermodynamics;
- Understand the concept of work and energy transfer by heat;
- Understand concepts of the Second Law of Thermodynamics;
- Demonstrate ability to evaluate and work with thermodynamic properties;
- Demonstrate ability to use control volume analysis for various engineering applications.
- Understand failure criterion for designs

ABET EAC Student 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						

CALCULATORS: only calculator approved for course are those permitted on (FE) exam. No graphing calculators.

- 1) Hewlett Packard—HP 33s and HP 35s models, but no others.
- 2) Casio—All fx-115 and fx-991 models. Any Casio calculator must contain fx-115 or fx-991 in its model name.
- 3) Texas Instruments: All TI-30X and TI-36X models. Any TI calculator must contain either TI-30X or TI-36X in its model name.

GRADES: Standard grading scale used: 90/80/70/60. Re-grade request must be made in class the day returned. No re-grade requests after class dismissed. Entire exam will be re-graded, which may result in lower score than originally assigned. Make-up NOT allowed only exception being University excused absences with documentation provided.

Attendance 5% **Taken In-class** (Extra credit for lecture participation)
 Homework 20% **Online PDF submissions**, problem solving / critical thinking
 Quizzes 20% **In-class**, problem solving, like home practice
 Mid Term 25% **In-class**, reading comprehension / multiple choice / qualitative
 Final Exam 30% **In-class**, reading comprehension / multiple choice / qualitative
Extra Credit is available in class, and through exams and quizzes

TENTATIVE LECTURE SCHEDULE

Week	Dates	Chapter	Topic	Quiz
1	Aug. 18 th – Aug. 22 nd	1	Intro	
2	Aug. 25 th – Aug. 29 th	1	Intro	
3	Sept. 1 st – Sept. 5 th	2	Energy & First law	
4	Sept. 8 th –Sept. 12 th	2	Energy & First law	
5	Sept. 15 th – Sept. 19 th	3	Evaluating properties	1
6	Sept. 22 nd – Sep. 26 th	3	Evaluating properties	
7	Sep. 29 th – Oct. 3 rd	3\4	Evaluating properties\Control volume analysis	
8	Oct. 6 th – Oct. 10 th	4	Control volume analysis	
Midterm (Thursday Oct 9th, In-class. same class time) (Ch: 1-4)				
9	Oct. 13 th – Oct. 17 th	5	Second law	
10	Oct. 20 th - Oct 24 th	5	Second law	
11	Oct. 27 th - Oct. 31 st	6	Entropy	
12	Nov. 3 rd - Nov. 7 th	6	Entropy	2
13	Nov. 10 th - Nov. 14 th	8	Vapor Power Systems	
14	Nov. 17 th - Nov. 21 st	9	Gas Power Systems	
15	Nov. 24 th - Nov. 28 th	Thanksgiving Break – No Classes		
16	Dec. 1 st - Dec. 5 th	-	Review	
Final (Thursday Dec 11th, In-class. 1:30pm – 3:30pm) (COMPREHENSIVE)				

COURSE POLICY: **Course delivery method is in-person.** All course announcements, lecture notes, recorded material and assignments will be posted on the MEET 3990 Canvas courses. *Students are expected to have access to the textbook on their own.*

HOMEWORK: All **Homework submissions are online** through CANVAS and in a PDF format. **NO LATE SUBMISSIONS ALLOWED** except for students with UNT-approved excuse (please follow UNT Policy 06.039).

EXAMS: All **quizzes and exams will be in-class**. If you have an emergency and need an authorized absence as per UNT Policy 06.039, **please connect with the Dean of Students' office requesting an excused absence in writing** (studentaffairs.unt.edu/dean-of-students).

ATTENDANCE: Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community.

If you experience any symptoms of COVID-19 (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus.

ACADEMIC INTEGRITY STANDARDS AND SANCTIONS FOR VIOLATIONS: According to UNT Policy 06.003, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Academic dishonesty will not be tolerated and will result in zero assignment score and reported to Office of Academic Integrity. No exceptions. Having any calculator not on the approved list is a violation of Academic Integrity.

ADA Policy: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at anytime, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website (<https://disability.unt.edu/>).

ACCEPTABLE BEHAVIOR: Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. To learn more, visit UNT's Code of Student Conduct (<https://deanofstudents.unt.edu/conduct>).

STUDENT PERCEPTIONS OF TEACHING EFFECTIVENESS (SPOT) Course participates in SPOT evaluations (<http://spot.unt.edu/> or email spot@unt.edu).

RETENTION OF STUDENT RECORDS Course follows Family Educational Rights and Privacy Act (FERPA) laws and UNT Policy 10.10, Records Management and Retention.

SYLLABUS CHANGES Instructor reserves right change syllabus. Any changes announced in class and posted to CANVAS with an accompanying email to student's UNT email address.

ACCESS TO INFORMATION - EAGLE CONNECT: Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle Connect (<https://it.unt.edu/eagleconnect>).