

UNIVERSITY OF NORTH TEXAS – Mechanical and Energy Engineering
MEEN 2210/MEET 3990 **THERMODYNAMICS I** SYLLABUS
Summer 2021. 3 Credit hours

Instructor: Dr. Hassan Qandil (hassan.qandil@unt.edu)
Office Hours: Via Email or Zoom Meetings.
Lectures: MW 8:00 am to 9:50 am
Location: ONLINE (ZOOM LECTURES)
Teaching Assistant: Almara, Laura <LauraAlmara@my.unt.edu>
TA Office Hours: Via Email or Zoom Meetings.

Pre-requisite:

Must complete Math 1720 and Phys 1710 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”, 8th edition, M.J. Moran, H.N. Shapiro, D.D. Boettner, M.B. Bailey, ISBN: 978-1-118-41293-0.

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% (Extra credit for interactive lecture participation)
 Homework 20% (Online PDF submissions)
 Quizzes 20% Online problem solving, like home practice
 Mid Term 25% Online reading comprehension / multiple choice / qualitative
 Final Exam 30% Online reading comprehension / multiple choice / qualitative
10% Extra Credit is available through exams and quizzes

TENTATIVE LECTURE SCHEDULE

Week	Dates	Chapter	Topic	Quiz
1	Jun. 1 st - Jun. 5 th	1	Intro	
2	Jun. 8 th - Jun. 12 th	2	Energy & First law	
3	Jun. 15 th - Jun. 19 th	2,3	Energy & First law, Evaluating properties	1
4	Jun. 22 nd - Jun. 26 th	3	Evaluating properties	
5	Jun. 29 th - Jul. 3 rd	Midterm (Monday, Jun 28th 8am to 10am) (Ch: 1-3) (Online using Lockdown Browser & Respondus Monitor)		
6	Jul. 6 th - Jul. 10 th	4	Control volume analysis	
7	Jul. 13 th - Jul. 17 th	5	Second law	2
8	Jul. 20 th - Jul. 24 th	5	Second law	
9	Jul. 27 th - Jul. 31 st	6	Entropy	3
10	Aug. 3 rd - Aug. 7 th	6	Entropy	
Final (Friday, Aug 6th, 8am to 10am) (COMPREHENSIVE) (Online using Lockdown Browser & Respondus Monitor)				

ACCEPTABLE BEHAVIOR: I consider this class to be place where you will be treated with respect. All expected to contribute to respectful and inclusive environment. Students engaging in unacceptable behavior that may violate the Code of Student Conduct will be directed to leave the ZOOM session and the instructor may refer the student to the Dean of Students for investigation. We enforce student Code of Student Conduct at deanofstudents.unt.edu/conduct.

REMOTE COURSE DELIVERY

- All course announcements, lecture notes, recorded lectures and assignments will be posted on the MEEN 2210 Canvas site. *Students are expected to have access to the textbook on their own.* I will try to provide recommendations for alternative educational resources that are available online, whenever possible.
- We will have synchronous (live) Zoom meetings during the regular class meeting times. All Zoom meeting invitations along with references to Zoom

resources will be posted on the MEEN 2210 Canvas site. We will **use Zoom chat in lieu of in-class discussions.**

- **It will be the student responsibility to log in to Zoom and join the virtual lecture** using the details provided on ZOOM tab in CANVAS.
- I will hold **virtual office hours** via live Zoom sessions, a student can schedule a meeting by emailing me (hassan.gandil@unt.edu).
- All **assignments** will be posted online via CANVAS. Submissions are also online through CANVAS and in a **PDF format**.
- All **quizzes and exams** will be conducted via CANVAS using a LockDown browser and Respondus Monitor, which required that the student have access to a webcam and a microphone. For more details, please refer to the following link: <https://clear.unt.edu/supported-technologies/respondus-lockdown-browser> (Links to an external site.)
- Your **attendance/class participation** will be evaluated based on your participation in Zoom sessions.

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 STATEMENT:

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify eligibility. If a disability verified, ODA will provide student with accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. For additional information see the ODA website at disability.unt.edu

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.