MEEN 2210.001 THERMODYNAMICS I
MEET 3990.001 APPLIED THERMODYNAMICS
Fall 2022
3 credit hours, Tuesday & Thursday 4:00-5:20pm, NTDP F175

Instructor: Weihuan Zhao
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Instructor Office Hours: Tuesday & Thursday 3:00-4:00pm plus open office policy

Instructional Assistant (IA): Ahmed Almatar (ahmedalmatar@my.unt.edu)

Required Textbook: (either one of the following textbooks is fine; the lectures will follow the chapters of the first textbook)

1. ***Thermodynamics, An Engineering Approach, 9th edition***, Cengel, Y.A., Boles, M.A., Kanoglu, M., McGraw Hill, 2019. ISBN: 978-1-259-82267-4.
2. ***Fundamentals of Engineering Thermodynamics, 8th edition***, Moran, M.J., Shapiro, H.N., Boettner, D.D., Bailey, M.B., Wiley, 2014. ISBN: 978-1-118-41293-0; ISBN: 978-1-118-82044-5.

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

Pre-requisites: Math 1720 and Phys 1710.

Course Learning Outcomes (CLO):

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

i. Demonstrate ability to formulate the first and second law of thermodynamics;
ii. Demonstrate ability to identify, formulate, and solve engineering problems;
iii. Understand concepts of the First Law of Thermodynamics;

iv. Understand the concept of work and energy transfer by heat;
v. Understand concepts of the Second Law of Thermodynamics;
vi. Demonstrate ability to evaluate and work with thermodynamic properties;
vii. Demonstrate ability to use control volume analysis for various engineering applications.

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 (SO)**						
	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)	10%	≥ 85%	A
Quizzes (~4)	15%	70-84.9%	B
Midterm Exam I (Ch 1~4)	25%	55-69.9%	C
Midterm Exam II (Ch 3~6)	25%	40-54.9%	D
Final Exam (Ch 7 and 10)	25%	< 40%	F
Total	100%		

Class Policy:

(1) If you are experiencing any symptoms of COVID-19, 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. UNT also requires you to contact the UNT COVID Hotline at 844-366-5892 or COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.
(2) Come in time before the class starts.
(3) Review the materials covered/taught in the previous class before coming to the class.
(4) Bring the textbook either as a hard copy or as an e-book to every class. This will help in following the class worked-out examples as well as the materials covered that day and assigned for further reading.
(5) Participate in Q&A.

Homework:

(1) Homework will be submitted on Canvas in e-copy with **one single pdf file**.
(2) Please turn in your homework on the due date *before 5:20pm*. **NO late homework will be collected.**
(3) Definition of "late": when the clock on Canvas passes the due time (5:20pm), homework turned in thereafter will be considered as "late" and will not be collected.
(4) Having no textbook is not a valid excuse for not doing your homework. It is the student's responsibility to acquire textbook for his/her study and bring to the classroom.
(5) Homework can be turned in (uploaded) on Canvas earlier than the due date.
(6) Homework dropped in the instructor's departmental mailbox will NOT be collected.
(7) Homework slid into the instructor's office will NOT be collected.
(8) Homework emailed to instructor's and IA's email boxes will NOT be accepted.
(9) Exceptions (late homework will be collected): medical emergence (student and important ones), religious holidays/duty, jury duty and military duty. Evidences must be submitted.

Quizzes and Exams:

(1) Quizzes are open book and open notes. **Exams are closed book closed notes with formula sheets.**
(2) Formula sheets can be maximum 1 page (for Midterm) or 2 pages (for Final), A4 or letter size, **single** side.
(3) Each student is responsible for preparing his/her own formula sheets.
(4) Formula sheets could include anything **BUT**: **solutions to homework or examples**. Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to the department and university.

(5) Instructor will check students' formula sheets before each exam.
(6) **There will be NO make-up quiz.**
(7) **There will be NO make-up exams. Exceptions**: medical emergency (student and important ones), religious holidays/duty, jury duty and military duty. Evidences must be submitted.
(8) **Exchanging anything without the approval from the proctor, including but not limited to, calculators/scratch papers/formula sheets/writing tools during the exam between/among students is prohibited.**
(9) **Using cell phone for whatever purpose during the exam is prohibited.**
(10) **Using Internet through whatever devices during the exam is prohibited.**
(11) **Peeking, talking & discussing (either by oral/written/sign language) between/among students during the exam is prohibited.**
(12) **Using any unauthorized/unapproved materials during the exam is prohibited.**
(13) **Using any type of earpiece/earbuds/earphone/Bluetooth/Stereo Headset (unless a with doctor's prescription/notes) during the exam is prohibited.**
(14) **Using any type of smart glasses (unless a with doctor's prescription/notes) during the exam is prohibited.**
(15) **Using any type of smart watches during the exam is prohibited.**

Calculator:

Graphing calculators will not be allowed during quizzes and exams. Only NCEES-approved calculators can be used (http://ncees.org/exams/calculator/).

Acceptable calculators are:

- Casio: All fx-115 and fx-991 models (Any Casio calculator must have "fx-115" or "fx-991" in its model name.)
- Hewlett Packard: The HP 33s and HP 35s models, but no others.
- Texas Instruments: All TI-30X and TI-36X models (Any Texas Instruments calculator must have "TI-30X" or "TI-36X" in its model name.)

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. For more information, please refer the Office of Disability Accommodation website at https://disability.unt.edu/

Academic Dishonesty:
There is a zero-tolerance policy for academic dishonesty. Cheating of 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: The date will be announced. A quiz will be given every other chapter.

Midterm Exam I (Temporary schedule and subject to change):
Oct. 6th, 2022, Thursday, 4:00-5:20pm, NTDP F175

Midterm Exam II (Temporary schedule and subject to change):
Nov. 8th, 2022, Tuesday, 4:00-5:20pm, NTDP F175

Final Exam (UNT official final schedule):
Dec. 15th, 2022, Thursday, 1:30-3:30pm, NTDP F175

Lecture Contents

Schedule Overview **(Subject to change)**

Week	Date	Topics	Homework Due
#1	Aug.30th – Sep.1st	Overview of Syllabus; Chapter 1	---
#2	Sep.6th - Sep.8th	Chapter 2	9/15
#3	Sep.13th - Sep.15th	Chapter 2; Chapter 3	9/22
#4	Sep.20th - Sep.22nd	Chapter 3	9/29
#5	Sep.27th - Sep.29th	Chapter 3; Chapter 4	---
#6	Oct.4th - Oct.6th	Chapter 4; Midterm I (Oct. 6th): covers Ch 1, 2, 3 and 4;	10/13
#7	Oct.11th - Oct.13th	Chapter 5	10/20
#8	Oct.18th - Oct.20th	Chapter 5	10/27
#9	Oct.25th - Oct.27th	Chapter 6	11/3
#10	Nov.1st - Nov.3rd	Chapter 6	---
#11	Nov.8th - Nov.10th	Midterm II (Nov. 8th): covers Ch 3, 4, 5 and 6; Chapter 7	11/17
#12	Nov.15th - Nov.17th	Chapter 7	11/29
#13	Nov.22nd - Nov.24th	Chapter 7; No class, Thanksgiving	---
#14	Nov.29th - Dec.1st	Chapter 10	12/8
#15	Dec.6th - Dec.8th	Chapter 10; Pre-final Day (Last Class Day)	---
#16	Dec. 15th, Thursday (1:30-3:30pm)	Final Exam: covers Ch 7 and 10	---

Disclaimer:

The course schedule, content, and assignments are subject to modification when circumstances dictate and as the course progresses. If changes are made, you will be given due notice.

Link for **Fall 2022 Final Exams** - **Discovery Park**
https://registrar.unt.edu/exams/final-exam-schedule/fall