

Instructor: Weihuan Zhao
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Lecture Time: Tuesday & Thursday 10:00-11:20am (Discovery Park B190)

Instructor Office Hours: Half hour before and half hour after each lecture session (on both Tuesday and Thursday)

TA/Grader: Mr. Bheemangouda Mudnal

TA/Grader Office Hours: By appointment via bheemangoudamudnal@my.unt.edu

Required Textbook: *Fundamentals of Engineering Thermodynamics, 8th edition*

M.J. Moran, H.N. Shapiro, D.D. Boettner, M.B. Bailey,

ISBN: 978-1-118-41293-0

ISBN: 978-1-118-82044-5

Course Description:

Thermodynamics II is the applications of fundamental thermodynamics laws and concepts. Course will discuss exergy analysis, vapor power system (Rankine cycle), gas power system (Otto cycle, Diesel cycle, Brayton cycle), refrigeration system/cycle, ideal gas mixture and psychrometric applications (air conditioning system), chemical reactions and chemical equilibria, combustion, flame temperature.

Pre-requisites: MEEN 2210 Thermodynamics I.

Course Learning Outcomes (CLO):

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

- i. Demonstrate an ability to correctly apply the 1st and 2nd laws of thermodynamics
- ii. Demonstrate an ability to analyze exergy and exergy destruction for different thermodynamics systems
- iii. Demonstrate an understanding on how to improve thermal efficiency for different thermodynamics systems based on 1st and 2nd law of thermodynamics
- iv. Demonstrate an ability to model and analyze various vapor power and gas power cycles/systems
- v. Demonstrate an understanding of gas mixtures and psychrometrics, and be able to analyze A/C systems
- vi. Demonstrate an ability to analyze reacting mixtures and simple combustion processes

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 3110 CLO	ABET EAC Student Outcomes (SO)						
	1	2	3	4	5	6	7
i	X						
ii	X						
iii	X			X			
iv	X						
v	X						
vi	X						

Grades:

Homework (~10)	10%	$\geq 85\%$	A
Quizzes (5-6)	15%	70-84.9%	B
Midterm Exam I (Ch 7, 8)	25%	55-69.9%	C
Midterm Exam II (Ch 9)	25%	40-54.9%	D
Final Exam (Ch 10, 12, 13)	25%	< 40%	F
Total	100%		

Class Policy:

- (1) **Face Coverings:** UNT encourages everyone to wear a face covering when indoors, regardless of vaccination status, to protect yourself and others from COVID infection, as recommended by current CDC guidelines. Face covering guidelines could change based on community health conditions.
- (2) **COVID monitoring and reporting:** COVID@unt.edu is monitoring campus COVID cases and answering COVID-related questions. If you experience any COVID symptoms, please report to COVID@unt.edu or the class instructor immediately.
- (3) Come in time before the class starts.
- (4) Review the materials covered/taught in the previous class before coming to the class.
- (5) 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.
- (6) Participate in Q&A.

Homework Policy:

- (1) Please turn in (upload) your homework on Canvas on the due date **before 11:20am**. **NO late homework will be collected.**
- (2) Definition of “late”: when the clock on Canvas passes the due time (11:20am), homework turned in thereafter will be considered as “late” and will not be collected.
- (3) 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.
- (4) Homework can be turned in (uploaded) on Canvas earlier than the due date.
- (5) Homework dropped in the instructor’s departmental mailbox will NOT be collected.
- (6) Homework slid into the instructor’s office will NOT be collected.
- (7) Homework emailed to instructor’s and TA/grader’s email boxes will NOT be accepted.
- (8) Exceptions (late homework will be collected): medical emergence (student and important ones), religious holidays/duty, jury duty and military duty. Evidences must be submitted.

Quiz and Exam Policy:

- (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) Formula sheets will be examined by the instructor before each exam.
- (6) **There will be NO make-up quiz; 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.

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 after each chapter is covered.

Midterm Exam I (Temporary schedule and subject to change):
Feb. 22nd, 2022, Tuesday, 10:00-11:20am, B190

Midterm Exam II (Temporary schedule and subject to change):
Mar. 29th, 2022, Tuesday, 10:00-11:20am, B190

Final Exam (UNT official final schedule):
May 12th, 2022, Thursday, 8:00-10:00am, B190

MEEN 3110.001 Thermodynamics II

Schedule Overview

(Please note the schedule may change based on the needs during the semester)

<u>Week</u>	<u>Date</u>	<u>Topics</u>	<u>Homework Due</u>
#1	Jan.18 th - Jan.20 th	Course Overview; Chapter 7	---
#2	Jan.25 th - Jan.27 st	Chapter 7	2/3
#3	Feb.1 st - Feb.3 rd	Chapter 7	2/10
#4	Feb.8 th - Feb.10 th	Chapter 8	2/17
#5	Feb.15 th - Feb.17 th	Chapter 8	2/24
#6	Feb.22 nd - Feb.24 th	Midterm I (Feb. 22 nd): covers Ch 7 and 8; Chapter 9	---
#7	Mar.1 st - Mar.3 rd	Chapter 9	3/10
#8	Mar.8 th - Mar.10 th	Chapter 9	3/24
#9	Mar.15 th - Mar.17 th	Spring break (No classes)	---
#10	Mar.22 nd - Mar.24 th	Chapter 9; Chapter 10	3/31
#11	Mar.29 th - Mar.31 st	Midterm II (Mar. 29 th): covers Ch 9; Chapter 10	---
#12	Apr.5 th - Apr.7 th	Chapter 10; Chapter 12	4/14
#13	Apr.12 th - Apr.14 th	Chapter 12	4/21
#14	Apr.19 th - Apr.21 st	Chapter 12	4/28
#15	Apr.26 th - Apr.28 th	Chapter 12; Chapter 13	5/5 (optional)
#16	May 3 rd - May 5 th	Chapter 13; Pre-final Day (Reviews)	---
#17	May 12 th (8:00- 10:00am)	Final Exam (Ch 10, 12 and 13)	---

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 **Spring 2022 Final Exams - Discovery Park**
<https://registrar.unt.edu/exams/final-exam-schedule/spring>