

Instructor: Hassan Qandil	
Office: F102C/D206A	Email: hassanqandil@my.unt.edu
Lecture Time: (Section-2: MWF 1:30 p.m.-2:20 p.m.) (Section-1: TTh 11:30 a.m.-12:50 p.m.)	
Instructor Office Hours: Monday 12:00 p.m.-1:00 p.m. & Tuesday 1:00 p.m.-2:00 p.m.	
Pre-requisites: MEEN 2210 Thermodynamics I.	
TA: Rohini Atluri (RohiniAtluri@my.unt.edu)	TA Office: D206A
TA Office Hours: Wednesday 10:00 a.m.-12:00 p.m. & Thursday 10:00 a.m.-12:00 p.m.	
Required Textbook: <u>Fundamentals of Engineering Thermodynamics, 8th edition</u> M. J. Moran, H. N. Shapiro, D. D. Boettner and M.B. Bailey ISBN-13: 978-1118412930 (8 th edition); ISBN-10: 1118412931 (8 th edition)	
Also required for exam: Thermodynamics Tables, printed or booklet	
Reference Book: <u>Thermodynamics: An Engineering Approach, 7th edition</u> Çengel and Boles ISBN 10: 0-07-131111-4 ISBN 13: 978-0071311113	

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).

Course Learning Outcomes (CLO):

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

1. Correctly apply the 1st and 2nd laws of thermodynamics.
2. Analyze exergy and exergy destruction for different thermodynamics systems.
3. Understanding how to improve thermal efficiency for different thermodynamics systems based on 1st and 2nd law of thermodynamics.
4. Model and analyze various vapor power and gas power cycles/systems.
5. Understand gas mixtures and psychrometrics, and analyze A/C systems.

ABET Student Learning Outcomes (SO):

- a Ability to apply mathematics, science and engineering principles.
- b Ability to design and conduct experiments, analyze and interpret data.
- c Ability to design a system, component, or process to meet desired needs.
- d Ability to function on multidisciplinary teams.
- e Ability to identify, formulate and solve engineering problems.
- f Understanding of professional and ethical responsibility.
- g Ability to communicate effectively.
- h The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- i Recognition of the need for and an ability to engage in life-long learning.
- j Knowledge of contemporary issues.
- k Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

CLO	ABET Student Outcomes (SO)										
	SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	SO10	SO11
1	X		X		X			X			
2	X				X			X			
3	X		X		X			X			
4	X		X		X			X			
5	X		X		X			X			
6	X				X				X		X

Grades:

Homeworks (All included)	10%	≥ 90%	A
Quizzes (All included)	20%	80-89.9%	B
Midterm (Ch 7 & 8)	25%	70-79.9%	C
Final (Ch 9, 10 & 12)	40%	60-69.9%	D
<u>Attendance & Participation</u>	<u>5%</u>	< 60%	F
Total	100%		

Calculator Policy:

The use of a calculator is required and allowed on all homework, exams and quizzes. Calculators with graphing capabilities will be allowed in the course for homework and quizzes. However, only calculators currently allowed in the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams will be allowed in ALL EXAMS. **NO other calculators will be approved for exams.** Please refer to the National Council of Examiners for Engineering and Surveying (NCEES) calculator policy for the list of acceptable calculators:

- **Casio:** All fx-115 and fx-991 models.
- **Hewlett Packard:** The HP 33s and HP 35s models, but no others.
- **Texas Instruments:** All TI-30X and TI-36X models.

Homework Policy:

1. “**Homework Day**”: The day new homework will be assigned (HW assignment will be posted in Blackboard) and previous homework will be collected is:
Friday (for MWF section) **Thursday (for TTh section)**
2. Homework should be turned in on the due day **before** the lecture starts. **NO late homework will be collected.** **Exceptions:** medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. **Documentary evidences** must be submitted.
3. Definition of “**late**”: when class is over and instructor steps outside the classroom, homework turned in thereafter will be considered as “**late**” and will not be collected.
4. Solutions to homework will be available in Blackboard after 5:00 pm Friday.
5. Having no textbook is not a valid excuse for not doing homework. It is the student’s responsibility to acquire textbook for his/her study.
6. Homework can be turned in earlier than the due day.
7. Homework dropped in the instructor’s departmental mailbox will NOT be collected.

8. Homework slid through the door into the instructor's office will NOT be collected.
9. Homework dropped in the "homework dropbox" in front of the department door will NOT be collected.
10. Homework turned in other than the due day or outside classroom must be turned in to instructor either IN PERSON or through EMAIL.
11. If homework is turned in through email, it should be scanned (or pictured by a smart phone), legible, and emailed to instructor before the class ends.
12. Homework should be stapled; instructor or TA will not be responsible for lost loose homework.
13. Homework solutions from the students that appear to be the same or copied from a peer will not be graded. You can work with classmates if you have questions or problems, but you are responsible for your own work!

Format of Homework:

- (1) Each Homework assignment has 5 problems; each problem has 20 points; therefore, each Homework assignment has a total of 100 points.
- (2) **Use engineering paper only (noncompliance: 20 points off; cumulative)**
- (3) **Only solve one problem per page of engineering paper (noncompliance: 10 points off; cumulative).** You may extend that problem into another page but then should begin the next problem on a new page if you require more room. If more than one page is needed for a solution you should number each page and the first page should be marked with a "continued on next page" note on the bottom.
- (4) Done in pencil, no ink. **(noncompliance: 10 points off; cumulative)**
- (5) No cross outs, use an eraser. **(noncompliance: 10 points off; cumulative)**
- (6) Homework set number, name, date, course number, and page number(s) on the top of the page. **(noncompliance: 10 points off; cumulative).**
- (7) **Solution** – provide all the details so that anybody can easily follow your solutions and problem-solving approach. All intermediate values should be identified with the variable name and units (e.g., $F_1=50\text{ N}$; $X_c = 2.1\text{ m}$).**(noncompliance: 10 points off; cumulative)**
- (8) **Answer** – the **Final Answer** at the end of the problem should be identified with the **variable name, include units, and inside a box**. Include an arrow (from the far right side of the page) pointing to each final answer.
(noncompliance: 10 points off; cumulative)

Example:

$$\boxed{F_1 = 50\text{ N}}$$



Exam Policy:

- (1) Exams are closed book and closed notes with approved formula sheets only.
- (2) **Formula sheets:** Use the formula sheets provided only, NOTHING ELSE. Do not write/mark anything on the formula sheets provided so they could be reused;
- (2) **Thermodynamics tables:** thermodynamics tables are needed for all exams. Instructor will NOT provide thermodynamics tables. Students need to print/buy thermodynamics tables for their study and exams.
- (3) **Calculator: ONLY** FE exam approved calculator models allowed.

- (4) Using ANY unauthorized/unapproved materials during the exam is prohibited and considered as cheating.
- (5) Exchanging (either borrowing or giving) ANYTHING without the approval from the proctor, including but not limited to, calculators/scratch papers/formula sheets/thermodynamics tables/writing tools during the exam between/among students is prohibited and considered as cheating.
- (6) Using cell PHONE for WHATEVER purpose during the exam is prohibited and considered as cheating.
- (7) Using Internet through any device during the exam is prohibited and considered as cheating.
- (8) Peeking, talking or discussing (either by oral/written/sign language) between/among students during the exam is prohibited and considered as cheating.
- (9) Using any type of earpiece/earbuds/earphone/Bluetooth/Stereo Headset (except with doctor's prescription/notes) during the exam is prohibited and considered as cheating.
- (10) Using any type of smart glasses (except with doctor's prescription/notes) during the exam is prohibited and considered as cheating.
- (11) Using any type of smart watches during the exam is prohibited and considered as cheating.
- (12) Cheating will result in SCORE ZERO in the exam and "F" grade for this course.
- (13) Cheating will be reported to the Department, College and University.
- (14) There will be NO make-up exam. Exceptions: medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. Documentary evidences must be submitted.
- (15) Makeup exam should be scheduled within one week after the regular exam date.

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 whatsoever will result in an automatic 'F' in this course and the matter will be turned over to the appropriate student disciplinary committee.

Professionalism:

One of the goals of this course is to teach students about professionalism, including the standards and expected behavior of your chosen profession. With this in mind, students are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. Students are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accepts constructive criticism in a productive manner; (6) demonstrate an attitude that fosters professional behavior among peers and faculty; (7) be punctual to class meetings; (8) maintain a good work ethic and integrity; and (9) recognize the classroom as a professional workplace.

Classroom Inclusivity Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

UNT Official Academic Calendar: Spring 2018

Date	Event
August 27, 2018	First Class Day (Monday)
September 3, 2018	Labor Day (no classes; university closed)
November 22-25, 2018	Thanksgiving Break (no classes; university closed)
December 5-6, 2018	Pre-finals Days
December 6, 2018	Last Class Day
December 7, 2018	Reading Day (no classes)
December 8-14, 2018	Finals
December 24, 2018 - January 1, 2019	Winter Break (no classes; university closed)

Important event:

Engineering & Computer Science Internship & Career Fair

Thursday, October 4, 2018

11am-3pm

Discovery Park

MEEN 3110 Thermodynamics II Schedule Overview

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

Week	Date	Lecture Topics
#1	Aug.27th - Aug.31st	Syllabus, Chapter 7: 7.1-7.3 Introducing Exergy; Exergy of a System
		Chapter 7: 7.4 Closed System Exergy Balance
#2	Sept.3rd– Sept.7th	<i>Sep. 3rd: Labor Day - no class (Only for MWF Section)</i>
		Chapter 7: 7.4 Closed System Exergy Balance
#3	Sept.10th – Sept.14th	Chapter 7: 7.5 Exergy Rate Balance for Control Volumes at Steady State
		Chapter 7: 7.5 Exergy Rate Balance for Control Volumes at Steady State
#4	Sept.17th – Sept.21st	Chapter 7: 7.6 Exergetic (Second Law) Efficiency
		Chapter 7: 7.6 Exergetic (Second Law) Efficiency , Quiz#1: Ch7
#5	Sept.24th – Sept.28th	Chapter 8: 8.1-8.2 The Rankine Cycle
		Chapter 8: 8.1-8.2 The Rankine Cycle
#6	Oct.1st– Oct.5th	Chapter 8: 8.3-8.4 Improving Rankine Cycle Performance, Quiz#2: Ch8
		<i>Oct. 4th: Career day - no class (Only for TTh Section)</i>
#7	Oct. 8th – Oct.12th	Chapter 8: 8.3-8.4 Improving Rankine Cycle Performance, Review
		Midterm (MWF-Oct.12th, TTh-Oct.11th)
#8	Oct. 15th – Oct.19th	Chapter 9: 9.1-9.2 Engine Terminology; Otto Cycle
		Chapter 9: 9.1-9.2 Engine Terminology; Otto Cycle
#9	Oct. 22nd – Oct.26th	Chapter 9: 9.3-9.4 Diesel Cycle
		Chapter 9: 9.3-9.4 Diesel Cycle
#10	Oct.29th – Nov.2nd	Chapter 9: 9.5-9.6 Brayton Cycle
		Chapter 9: 9.5-9.6 modified Brayton Cycle, Quiz#3: Ch9
#11	Nov.5th – Nov.9th	Chapter 9: 9.5-9.6 modified Brayton Cycle
		Chapter 10: 10.1-10.3 Analyzing Refrigeration Systems
#12	Nov 12th – Nov.16th	Chapter 10: 10.1-10.3 Analyzing Refrigeration Systems
		Chapter 10: 10.1-10.3 Analyzing Refrigeration Systems, Quiz#4: Ch10
#13	Nov.19th – Nov.23rd	Chapter 12: 12.1-12.3 Describing Mixture; Evaluating properties
		<i>Nov.22nd – Nov.23rd: Thanksgiving</i>
#14	Nov.26th – Nov.30th	Chapter 12: 12.4-12.5 Psychrometric Principles
		Chapter 12: 12.6-12.8 Dehumidification
#15	Dec. 3rd – Dec. 7th	Chapter 12: 12.8 Evaporative cooling
		Chapter 12: 12.8 Mixing Air Streams
		December 5-6, pre-final days (no new materials; review) Dec 6th last class day Dec 7th Reading day (No class)
#16	Dec. 8th – Dec. 14th	Final Exam week For MWF 1:30 p.m.-2:20 p.m.: Dec 8th, 10:30 a.m.-12:30 p.m. For TTh 11:30 p.m.-12:50 p.m.: Dec 11th, 10:30 a.m. -12:30 p.m.