

**Instructor:** Xiaohua Li  
**Office:** NTDP F101G  
**Phone:** 940-369-8020  
**Email:** xiaohua.li@unt.edu  
**Lecture Time:** Tuesday & Thursday 12:30 p.m.-2:20 p.m. room NTDP F175  
**Office Hours:** T/TH: 9:00-10:00 plus open office policy

**Required Textbook:** Fundamentals of Engineering Thermodynamics, 8<sup>th</sup>  
M. J. Moran, H. N. Shapiro, D. D. Boettner and M.B. Bailey  
ISBN-13: 978-1118412930 (8<sup>th</sup> edition); ISBN-10: 1118412931 (8<sup>th</sup> edition)

**Reference Book:** Thermodynamics: An Engineering Approach, 7th edition  
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).

**Pre-requisites:** MEEN 2210 Thermodynamics I.

### Course Learning Outcomes (CLO):

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

1. Demonstrate an ability to correctly apply the 1st and 2nd laws of thermodynamics
2. Demonstrate an ability to analyze exergy and exergy destruction for different thermodynamics systems
3. Demonstrate an understanding on how to improve thermal efficiency for different thermodynamics systems based on 1st and 2nd law of thermodynamics
4. Demonstrate an ability to model and analyze various vapor power and gas power cycles/systems
5. Demonstrate an understanding of refrigeration system
6. Demonstrate an understanding of gas mixtures and psychrometrics, and be able to 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

<b>Grades:</b> Homework (8)	10%	≥ 90	A
Quizzes (highest 3/5)	10%	80-89.9	B
Exam #1 (Ch7&8)	25%	70-79.9	C
Exam #2 (Ch9 only)	25%	60-69.9	D
Final (Exam #3) (Ch 10&12)	25%	< 60	F
Attendance (5/6)	5%		
<b>Total</b>	<b>100%</b>		

### Homework Policy:

1. “**Homework Day**”: **Thursday**. the day new homework will be assigned (HW will be posted in Blackboard only) and previous homework will be collected;
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 posted in Blackboard after 2:30 pm Thursday
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) and emailed to instructor before the class ends (2:20p.m)
12. Homework should be stapled. Instructor or TA will not be responsible for lost loose homework pages.

### Exam and Quiz Policy:

- (1) **Quizzes are open book and open notes.**
- (2) **Exams are closed book and closed notes with formula sheets and thermodynamics tables.**
- (3) Formula sheets could be maximum 5 pages **on top of** instructor’s handouts, A4 or letter size, both sides

- (4) **Student is responsible for preparing his/her own formula sheets. Instructor will NOT provide any formula sheets for the exam**
- (5) **Student is responsible for preparing/purchasing/print his/her own thermodynamics tables. Instructor will NOT provide any thermodynamics tables for the exam**
- (6) Formula sheets could include anything **BUT: solutions of any kind/format** (numerical or symbolic) to homework problem or lecture/textbook examples. Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to MEE department and University.
- (7) Formula sheets must be turned in with the exam papers (in the case of formula sheets were not checked by the instructor during the exam). Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to MEE department and university
- (8) **There will be NO make-up quiz. Exceptions:** medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. **Documentary evidences** must be submitted.
- (9) **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.
- (10) **All make-up quizzes and exams should be completed within one week after the regular quizzes and exams.**
- (11) **Exchanging 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**
- (12) **Using cell phone for whatever purpose during the exam is prohibited.**
- (13) **Using Internet through whatever devices during the exam is prohibited.**
- (14) **Peeking, talking & discussing (either by oral/written/sign language) between/among students during the exam is prohibited**
- (15) **Using any unauthorized/unapproved materials during the exam is prohibited**
- (16) **Using any type of earpiece/earbuds/earphone/Bluetooth/Stereo Headset (unless a with doctor's prescription/notes) during the exam is prohibited**
- (17) **Using any type of smart glasses (unless a with doctor's prescription/notes) during the exam is prohibited**
- (18) **Using any type of smart watches during the exam is prohibited**

**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.

### IMPORTANT EXAM DATES

Exam #1 (**tentative; depends on whenever chapter 8 is finished; Covers Ch 7 and 8**):  
June 29<sup>th</sup> 2017, Thursday 12:30 p.m.-2:20 p.m. room F175

Exam #2: (**tentative; depends on whenever chapter 9 is finished; Covers Ch 9 only**):  
July 20<sup>th</sup>, 2017, Thursday 12:30 p.m.-2:20 p.m. room F175

Exam #3 (Final, **covers Ch 10 and 12**):  
Aug 11<sup>th</sup>, 2017, Friday, 12:30 p.m.-2:20 p.m. room F175

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### UNT Official Academic Calendar: Summer 2017 - 10W Term

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Date	Event
June 5, 2017	First Class Day
July 4, 2017	Independence Day (no classes: university closed)
August 10, 2017	Last Class Day
August 11, 2017	Finals

### UNT Official Summer 2017 Final Exams

<i>This session...</i>	<i>Has final exams on this date...</i>
3W1	June 1, 2017
8W1	July 7, 2017
SUM	August 11, 2017
5W1	July 7, 2017
<b>10W</b>	<b>August 11, 2017</b>
8W2	July 28, 2017
5W2	August 11, 2017

**Exams will meet at the same time and location assigned to the class unless other arrangements have been made.**

**Thermodynamics II-MEEN 3110**  
**Topics and Tentative Schedule**

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

Week	Date	Topic
#1	Jun. 5 Jun. 9	-Course Overview; Review of Thermodynamics I -Chapter 7: 7.1-7.3 Introducing Exergy; Exergy of a System
#2	Jun. 12 Jun. 16	-Chapter 7: 7.4 Closed System Exergy Balance -Chapter 7: 7.5 Exergy Rate Balance for Control Volumes at Steady State
#3	Jun. 19 Jun. 23	-Chapter 7: 7.6 Exergetic (Second Law) Efficiency -Chapter 8: 8.1-8.2 The Rankine Cycle
#4	Jun. 26 Jun. 30	-Chapter 8: 8.3-8.4 Improving Rankine Cycle Performance <b>-Exam #1: Covers Ch 7 and 8</b>
#5	Jul. 3 Jul. 7	<b>-Jul. 4th 2017. Tuesday; Independence Day (no classes: university closed)</b> -Chapter 9: 9.1-9.2 Engine Terminology; Otto Cycle
#6	Jul. 10 Jul. 14	-Chapter 9: 9.3-9.4 Diesel Cycle; -Chapter 9: 9.5-9.6 Brayton Cycle
#7	Jul. 17 Jul. 21	-Chapter 9: 9.5-9.6 Brayton Cycle <b>-Exam #2: Covers Ch 9 only</b>
#8	Jul. 24 Jul. 28	-Chapter 10: 10.1-10.3 Analyzing Vapor-Compression Refrigeration Systems -Chapter 10: 10.1-10.3 Analyzing Vapor-Compression Refrigeration Systems
#9	Jul. 31 Aug. 4	-Chapter 12: 12.1-12.3 Describing Mixture; Evaluating properties -Chapter 12: 12.4-12.5 Psychrometric Principles
#10	Aug. 7 Aug. 11	-Chapter 12: 12.4-12.5 Psychrometric Charts; -Chapter 12: 12.6-12.8 Dehumidification
	Aug. 11	<b>-Exam #3 (Final Exam): Covers Ch 10 and 12</b>

**Document History:**

Dr. Xiaohua Li prepared on 08/01/2011, last updated on 05/28/2017