MEEN 3110  Thermodynamics II  Spring 2021

Instructor:   Weihuan Zhao
Office:      Discovery Park F101M (Mechanical Engineering Dept.)
Phone:       940-369-5929
Email:       weihuan.zhao@unt.edu

Lecture Time: Tuesday & Thursday 10:00-11:20am (Remote, zoom sessions)

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

TA/Grader:   Mr. Kayode Oluwabunmi  kayodeoluwanmi@my.unt.edu
TA/Grader Office Hours: Make appointments via email

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

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 |
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Class Policy:

(1) Come in time before the class starts.
(2) Review the materials covered/taught in the previous class before coming to the class.
(3) 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.

(4) 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 class is over and the instructor exits the Zoom meeting section, 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) **Quizzes and exams must be submitted on Canvas before the due time.**

(3) Quizzes and exams dropped in the instructor’s departmental mailbox will NOT be collected; Quizzes and exams slid into the instructor’s office will NOT be collected; Quizzes and exams emailed to instructor’s and TA/grader’s email box will NOT be accepted.

(4) Formula sheets can be maximum 1 page (for Midterm) or 2 pages (for Final), A4 or letter size, ***single*** side.

(5) Each student is responsible for preparing his/her own formula sheets.

(6) 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.

(7) Formula sheets must be turned in (uploaded) with the exam papers. 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.

(8) All students must turn on their cameras to show their working area during the exams.

(9) 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. 16th, 2021, Tuesday, 10:00-11:20am, On the Zoom Section

Midterm Exam II (Temporary schedule and subject to change):
Mar. 16th, 2021, Tuesday, 10:00-11:20am, On the Zoom Section

Final Exam (UNT official final schedule):
April 29th, 2021, Thursday, 8:00-10:00am, On the Zoom Section
# MEEN 3110.001 Thermodynamics II

## Schedule Overview

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Homework Due</th>
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<tr>
<td>#1</td>
<td>Jan.12&lt;sup&gt;th&lt;/sup&gt; - Jan.14&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Course Overview; Chapter 7</td>
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<td>#2</td>
<td>Jan.19&lt;sup&gt;th&lt;/sup&gt; - Jan.21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Chapter 7</td>
<td>1/28</td>
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<td>#3</td>
<td>Jan.26&lt;sup&gt;th&lt;/sup&gt; - Jan.28&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Chapter 7</td>
<td>2/4</td>
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<td>#4</td>
<td>Feb.2&lt;sup&gt;nd&lt;/sup&gt; - Feb.4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Chapter 8</td>
<td>2/11</td>
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<td>#5</td>
<td>Feb.9&lt;sup&gt;th&lt;/sup&gt; - Feb.11&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Chapter 8</td>
<td>2/18</td>
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<td>#6</td>
<td>Feb.16&lt;sup&gt;th&lt;/sup&gt; - Feb.18&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Midterm I (Feb. 16&lt;sup&gt;th&lt;/sup&gt;): covers Ch 7 and 8; Chapter 9</td>
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<td>Chapter 9</td>
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<td>#8</td>
<td>Mar.2&lt;sup&gt;nd&lt;/sup&gt; - Mar.4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Chapter 9</td>
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<td>#9</td>
<td>Mar.9&lt;sup&gt;th&lt;/sup&gt; - Mar.11&lt;sup&gt;th&lt;/sup&gt;</td>
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<td>Apr.20&lt;sup&gt;th&lt;/sup&gt; - Apr.22&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>Chapter 13; Pre-final Day (Reviews)</td>
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<td>#16</td>
<td>April 29&lt;sup&gt;th&lt;/sup&gt; (8:00-10:00am)</td>
<td>Final Exam (Ch 10, 12 and 13)</td>
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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 2021 Final Exams - Discovery Park**
[https://registrar.unt.edu/exams/final-exam-schedule/spring](https://registrar.unt.edu/exams/final-exam-schedule/spring)