Instructor: Xiaohua Li
Office: NTDP F101G
Phone: 940-369-8020
Email: xiaohua.li@unt.edu
Lecture Time: Monday & Wednesday 12:30 p.m.-2:20 p.m. room NTDP B155
Office Hours: MW: 3:00 p.m.-4:30 p.m. plus open office policy

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

Çengel and Boles

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 | | | | | | |
3 | X | | X | | | | | | |
4 | X | | X | | | | | | |
5 | X | | X | | | | | | |
6 | | X | | X | | | | | |

Grades: Homework (8)  10%  ≥ 90  A
Quizzes (highest 3/5)  10%  80-89.9  B
Exam #1 (Ch 7 & 8)  25%  70-79.9  C
Exam #2 (Ch 9 only)  25%  60-69.9  D
Final (Exam #3) (Ch 10 & 12)  25%  < 60  F
Attendance (5/6)  5%
Total  100%

Homework Policy:
1. “Homework Day”**: Wednesday. The day new homework will be assigned (HW assignment will be posted in Blackboard) and homework assigned in previous week will be collected;
2. Homework should be turned in on the due day before the lecture starts. **NO late homework will be collected**
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 Wednesday
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 into 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 smartphone) and emailed to instructor before the class ends (2:20 p.m.)
12. Homework should be stapled, instructor or TA will not be responsible for lost loose homework
13. **Exceptions** (late homework will be collected): medical emergency (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. **Documentary evidences** must be submitted.

Exam and Quiz:
(1) Quizzes are open book and open notes
(2) **Exams are closed book and closed notes with instructor’s handouts, formula sheets and thermodynamics tables**

(3) Instructor will NOT provide thermodynamics tables. Student is responsible for preparing his/her own thermodynamics tables.

(4) Formula sheets could be maximum 5 pages on top of instructor’s handouts, A4 or letter size, both sides.

(5) Student is responsible for preparing his/her own formula sheet.

(6) Formula sheets could include anything **EXCEPT:** solutions of any kind/format (numerical or symbolic) 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 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.

**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 when chapter 8 is finished; Covers Ch 7 and 8):

June 29th, 2016, Wednesday 12:30 p.m.-2:20 p.m. room B155

Exam #2: (tentative; depends on when chapter 9 is finished; Covers Ch 9 only):

July 20th, 2016, Wednesday 12:30 p.m.-2:20 p.m. room B155

Exam #3 (Final, covers Ch 10 and 12):

Aug 12th, 2015, Friday, 12:30 p.m.-2:20 p.m. room B155

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 6, 2016</td>
<td>First Class Day</td>
</tr>
<tr>
<td>July 4, 2016</td>
<td>Independence Day (no classes: university closed)</td>
</tr>
<tr>
<td>August 10, 2016</td>
<td>Last Class Day</td>
</tr>
<tr>
<td>August 12, 2016</td>
<td>Finals</td>
</tr>
</tbody>
</table>
Summer Final Exam Schedule

Summer 2016 Final Exams

<table>
<thead>
<tr>
<th>This session...</th>
<th>Has final exams on this date...</th>
</tr>
</thead>
<tbody>
<tr>
<td>3W1</td>
<td>June 2, 2016</td>
</tr>
<tr>
<td>8W1</td>
<td>July 8, 2016</td>
</tr>
<tr>
<td>SUM</td>
<td>August 12, 2016</td>
</tr>
<tr>
<td>5W1</td>
<td>July 8, 2016</td>
</tr>
<tr>
<td><strong>10W</strong></td>
<td><strong>August 12, 2016</strong></td>
</tr>
<tr>
<td>8W2</td>
<td>July 29, 2016</td>
</tr>
<tr>
<td>5W2</td>
<td>August 12, 2016</td>
</tr>
</tbody>
</table>

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

(SUBJECT TO CHANGE)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Jun. 6</td>
<td>-Course Overview; Syllabus; Review of Thermodynamics I</td>
</tr>
<tr>
<td></td>
<td>Jun. 8</td>
<td>-Chapter 7: 7.1-7.3 Introducing Exergy; Exergy of a System</td>
</tr>
<tr>
<td>#2</td>
<td>Jun. 13</td>
<td>-Chapter 7: 7.4 Closed System Exergy Balance</td>
</tr>
<tr>
<td></td>
<td>Jun. 15</td>
<td>-Chapter 7: 7.5 Exergy Rate Balance for Control Volumes at Steady State</td>
</tr>
<tr>
<td>#3</td>
<td>Jun. 20</td>
<td>-Chapter 7: 7.6 Exergetic (Second Law) Efficiency</td>
</tr>
<tr>
<td></td>
<td>Jun. 22</td>
<td>-Chapter 8: 8.1-8.2 The Rankine Cycle</td>
</tr>
<tr>
<td>#4</td>
<td>Jun. 27</td>
<td>-Chapter 8: 8.3-8.4 Improving Rankine Cycle Performance</td>
</tr>
<tr>
<td></td>
<td>Jun. 29</td>
<td>-Exam #1: Covers Ch 7 and 8</td>
</tr>
<tr>
<td>#5</td>
<td>Jul. 4</td>
<td>Independence Day (no classes: university closed)</td>
</tr>
<tr>
<td></td>
<td>Jul. 6</td>
<td>-Chapter 9: 9.1-9.2 Engine Terminology; Otto Cycle</td>
</tr>
<tr>
<td>#6</td>
<td>Jul. 11</td>
<td>-Chapter 9: 9.3-9.4 Diesel Cycle;</td>
</tr>
<tr>
<td></td>
<td>Jul. 13</td>
<td>-Chapter 9: 9.5-9.6 Brayton Cycle</td>
</tr>
<tr>
<td>#7</td>
<td>Jul. 18</td>
<td>-Chapter 9: 9.5-9.6 Brayton Cycle</td>
</tr>
<tr>
<td></td>
<td>Jul. 20</td>
<td>-Exam #2: Covers Ch 9 only</td>
</tr>
<tr>
<td>#8</td>
<td>Jul. 25</td>
<td>-Chapter 10: 10.1-10.3 Analyzing Vapor-Compression Refrigeration Systems</td>
</tr>
<tr>
<td></td>
<td>Jul. 27</td>
<td>-Chapter 10: 10.1-10.3 Analyzing Vapor-Compression Refrigeration Systems</td>
</tr>
<tr>
<td>#9</td>
<td>Aug. 1</td>
<td>-Chapter 12: 12.1-12.3 Describing Mixture; Evaluating properties</td>
</tr>
<tr>
<td></td>
<td>Aug. 3</td>
<td>-Chapter 12: 12.4-12.5 Psychrometric Principles</td>
</tr>
<tr>
<td>#10</td>
<td>Aug. 8</td>
<td>-Chapter 12: 12.4-12.5 Psychrometric Charts;</td>
</tr>
<tr>
<td></td>
<td>Aug. 10</td>
<td>-Chapter 12: 12.6-12.8 Dehumidification</td>
</tr>
<tr>
<td></td>
<td>Aug. 12</td>
<td>-Exam #3 (Final Exam): Covers Ch 10 and 12</td>
</tr>
</tbody>
</table>

Document History:

Dr. Xiaohua Li prepared on 08/01/2011, last updated on 06/04/2016