Western New England University
Springfield, Massachusetts
College of Engineering
ME 304-Thermodynamics II
Course Policies
Spring 2017

Lectures: Room # S301
Monday, Wednesday, Friday 8:00-8:50

Instructor: Mehdi Mortazavi, Assistant Professor
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Office Hours: Monday 2:00-3:00 pm;
Tuesday 2:00-3:00 pm;
Wednesday 2:00-4:00 pm;
Thursday 2:00-3:00 pm;
Other hours by appointment

Prerequisites: ME 303

Course Description: This intermediate course is offered to Mechanical Engineering majors and other majors and is designed to teach thermodynamic analysis of various power and refrigeration cycles. The first and second law analyses of the Carnot, Rankine, Otto, Diesel, Brayton, Sterling, and Ericsson cycles will be presented. Reheating and regeneration concepts will be discussed and applied to the Rankine cycle. Maxwell Relations are used to establish relationships among thermodynamic properties. Practical examples are utilized to teach students the analysis of non-reactive ideal gases in particular the air-water vapor mixture. The method of assessing students will include in-class and homework assignments, quizzes, exams, and a project. (3 credits)

Materials: **Required:**
Cengel, Yunus A., Boles, Michael A., **Thermodynamics: An Engineering Approach 8th edition**, McGraw-Hill

Supplementary:
Scientific calculator, hand-held, self-powered

Learning Objectives and Outcomes:
The primary outcomes of this second course in thermodynamics are:
1. Students will be capable of analyzing and designing a vapor or gas power cycle given a set of operational parameters and constraints, determining cycle efficiency, its power output, and required heat input [a, c, e, g, k].
2. For the steam power cycle, students will be able to make modifications to improve the overall cycle efficiency and output power [a].
3. Given the requirements and constraints of a refrigeration system, students will be capable of analyzing and optimizing a vapor refrigeration system [a, c, e, g, k].
4. Students will be able to determine the moisture content in air and perform calculations for humidification and de-humidification processes [a].

5. Students will be able to apply the thermodynamic principles by completing either an open ended design project or concept feasibility project which involves the design of a relatively complex thermal system (such as a home air conditioning system).
6. Students will be capable of calculating the properties of gas mixtures using thermodynamic relations, of interpreting thermodynamic property tables and graphs and determine property values, and apply to various thermodynamic equations of state [a].

Note: [ ] corresponds to ABET Criterion for Program Outcomes and Assessment.

Assessment: Students will be evaluated on their performance on homework assignments, quizzes, examinations, and a project. Work will ordinarily be available for student review within one week of submission. **All in-class quizzes and examinations are closed book.**

Requirements:
A. Assignments and Examinations
The written work for the course will consist of daily homework assignments, in-class quizzes, in-class projects, examinations, and a two-hour comprehensive final examination. Homework assignments will consist of both a reading and writing component; the student is responsible for reading the material that will be discussed in the following class and for reviewing in detail, prior to the class session, the example problems illustrated in the text. Each student is responsible for his or her own work. The use of the students calculator for all quizzes and examinations is required. The Course Syllabus outlines the material that will be covered during each class session.

B. Writing Component
All written work is to be of the highest quality. Each student is expected to demonstrate, in writing, an appropriate understanding of the concepts of thermodynamics in the assigned projects. All written reports will be evaluated on the basis of appropriate organization, proper communication, neatness, grammar, spelling, and punctuation.

C. Computer Usage
When appropriate, computer use is encouraged.

D. Attendance and Assignments Students are expected to:
1. Be punctual and attend all class sessions;
2. Complete all assigned homework which will be collected and graded;
3. Take all quizzes, in-class exams, and the scheduled final examination;
4. Satisfy the reading requirement for all assigned chapters; and,
5. Complete all assigned projects.

E. Policy:
1. Non-compliance of ANY item in Section D is grounds for course failure;
2. Missed lectures and quizzes will NOT be made up. A student missing an examination will be given the opportunity to make up the exam ONLY if he/she presents satisfactory evidence that his/her absence was unavoidable. It is the obligation of the student to notify the instructor prior to the exam, at which time, arrangements will be made for a make-up exam. Students will receive an exam grade of 0 for all unexcused absences;
3. Students are responsible for the material contained in the text as well as for all the material discussed in class;
4. Each homework problem is to be individually done in a neat, logical and orderly manner on letter size paper (11 inch x 8.5 inch). Follow the format outlined in ENGR 103.
   Step 1: Restate problem
   Step 2: List assumptions and make a sketch
   Step 3: Work problem sequentially and orderly
   Step 4: Box answers
   Step 5: THINK, Does the answer make sense?

Problems must be submitted on only **one side** of sheets (although multiple problems can be put on one sheet if done neatly and clearly). Put the homework sheet (homework statement posted on Kodiak) and staple your worked sheets into it. Write your name on the top right of all pages **including the cover page**. All sheets must be **stapled** together in the upper left corner.

- Submit your homework on letter size sheets (any pattern is acceptable). Homeworks done on pages torn from spiral notebooks or pad will be graded out of 60% of the full credit.
- Please stable all papers properly. Folding edge of sheets together or any other *masterpiece* is not accepted (they get 60% of the full credit).
- Write on one side of sheet. However, you can solve multiple questions on the same sheet (questions solved on the back side of papers will get 60% of the full credit).
- Homeworks should be submitted in hard copy format. Homeworks sent by email are not accepted (under any circumstances).
- It is highly recommended (not mandated) that you solve homeworks (and exams) by pencils. We are engineers and it is likely to make mistakes as we start solving a problem.
- Late homeworks are not accepted under any circumstances. This is because solutions will be posted immediately after the deadline. If you have missed the deadline **for ANY reasons**, you need to submit the *extra activity assignment* which has 60% credit of the original homework. Students who submit homeworks on time are not required to submit this particular assignment.

5. Homework will generally be assigned each week and must be submitted at the beginning of the class period for which it is due. **Late homework will NOT be accepted.**

Methodology: Class lectures, discussion, problem solving, quizzes, project, and exams.

Grading:

Exams during semester (6 exams)	42%
Homeworks	20%
Projects	10%
Final Exam	20%
Quizzes	8%
Final Grade	100%

Grading Policy
Numerical grades earned throughout the semester will be averaged in the proportions noted above and converted to a final letter grade based on the ranges shown below:

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	65-69
D	60-64
F	0-59

Significance of Numerical Results:
When solving an engineering problem, the accuracy of the solution cannot be greater than that of the data provided. Numerical answers to problems must always be given using the number of significant figures appropriate to the problems statement and data used.

Course Policies (continued)
Other:
- You are not permitted to borrow your friend's calculator during a quiz or exam.
- Questions are always welcomed.
- The instructor reserves the right to change both the course policy and syllabus as the need arises. Students will be notified of any such changes.

Integrity and Scholarship:
The policy on Integrity of Scholarship is stated on page 26 of the Western New England University 2012-2013 Catalogue (available at http://www1.wne.edu/catalogue/). "Honesty in all academic work is expected of every student. This means giving ones own answers in all class work (including reports), quizzes, and examinations without help from any source not approved by the instructor. Written material is to be the students original composition. Appropriate credit must be given for outside sources from which ideas, language, or quotations are derived. Dishonesty is cause for failure and/or dismissal.

Absence Dictated by Religious Beliefs:
Any student who is unable, because of his/her religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or study or work requirement which he or she may have missed because of such absence on a particular day, provided, however, that such makeup examination or work shall not create an unreasonable burden upon such school. **It is the responsibility of the student to make arrangements prior to the date of absence for completing the missed work.**

Student Disability Services:
The Department of Mechanical Engineering complies with the Americans With Disabilities Act in making reasonable accommodations for qualified students with disabilities. To request academic accommodations, the SDS Office in Deliso G05 can be contacted for information.

Class Cancellation:
When classes are cancelled, work that was due on the cancelled date will be collected at the next class meeting; quizzes (if any) and examinations that were scheduled on that date will be administered during the next class meeting.

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Course Syllabus*
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Textbook Cengel, Yunus A., Boles, Michael A., **Thermodynamics: An Engineering Approach 8th Edition**

Week	Class Topic	Reading Assignments
1	Review of ME 303	Ch. 1,2,3,4,5,6,7
2	Vapor Power Cycle	Ch. 10
3	Vapor Power Cycle & Exam 1	Ch. 10
4	Refrigeration Cycle	Ch. 11
5	Refrigeration Cycle & Exam 2	Ch. 11
6	Gas Power	Ch. 9
7	Gas Power & Exam 3	Ch. 9
8	Combined Power Cycle	Ch. 10
9	Thermodynamics Property Relations	Ch. 12
10	Thermodynamics Property Relations & Exam 4	Ch. 12
11	Gas Mixtures	Ch. 13
12	Gas Mixtures & Exam 5	Ch. 13
13	Gas Vapor Mixtures	Ch. 14
14	Air Conditioning & Exam 6	Ch. 14
15	Review	Ch. 9,10,11,12,13,14

*Note: This is not a firm list. There may be addition and/or deletions and/or any other modifications during the semester.