Western New England University
Springfield, Massachusetts
College of Engineering
ME-303 Thermodynamics I
Course Policies
Fall 2016

Lectures:	Room # S301 Tuesday, Thursday 9:30-10:50 (ME 303-01) Tuesday, Thursday 11:00-12:20 (ME 303-03)
Instructor:	Mehdi Mortazavi, Assistant Professor office # S209 office: 413-782-1490 email: mehdi.mortazavi@wne.edu
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:	CHEM 105; MATH 235

Course Description: This introductory course is offered to both mechanical engineering majors and non-majors. It is intended to familiarize students with the fundamental concepts of the first and second laws of thermodynamics. Students will learn how to determine thermodynamic properties of real and ideal substances by using thermodynamic property tables and mathematical relationships. The concepts of energy, heat, work, entropy, reversible and irreversible processes are introduced and applied to real engineering systems and thermodynamic cycles. The methods of assessing students include homework assignments, quizzes, examinations, projects, and a final exam. (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 objective of this course in thermodynamics is to enable the student to enhance their engineering problem solving skills, to analyze problems in a systematic and logical manner, and develop a clear understanding of the theory and application of the principles of thermodynamics. After having successfully completed this course, the student will be able to:
1. Determine the thermodynamic properties of real and ideal substances by using thermodynamic property tables and mathematical relationships, and then apply them to various thermodynamic equations of state [a].
2. Apply the First Law of Thermodynamics (Conservation of Energy principle) and the Conservation of Mass principle to model, analyze, and design a variety of open and closed thermodynamic systems such as nozzles, turbines, throttling valves, heat exchangers, refrigeration systems, vapor cycle power plants, etc. [a].

3. Explain and apply the Second Law of Thermodynamics to a variety of thermodynamic processes, model a variety of open and closed thermodynamic systems such as nozzles, turbines, throttling valves, heat exchangers, refrigeration systems, vapor cycle power plants, etc., and describe its implications and influences [a, c, e, k].
4. List, describe, and apply the various equations of state to model non-measurable properties in terms of measurable properties for incompressible substances and ideal gases [a, e, k].

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

Assessment: Students will be evaluated on their performance on homework assignments, quizzes, examinations, and projects. 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, three 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 attached 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. Cell phones and pagers must be switched off during class time. Unauthorized web surfing or instant messaging during class time is not permitted;
3. 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;
4. Students are responsible for the material contained in the text as well as for all the material discussed in class;
5. Each homework problem is to be individually done in a neat, logical and orderly manner on engineering paper (i.e., an Engineers Computation Pad) following 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 a separate sheet of paper on only one side of a sheet (although multiple problems can be put on one sheet if done neatly and clearly). The first sheet of each homework assignment should be the homework sheet (sheet containing problem statements) followed by student's worked sheets.

Provide students name, course code, section number, assignment and problem numbers in the upper right corner. Subsequent pages should include student name and, assignment number. All sheets are to be **stapled** together in order in the upper left corner;
6. **Homework not adhering to the format described in Item E5**, as well as that submitted on paper torn from either a bound or spiral book or pad, **will not be accepted**;
7. 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, experiments, discussion, problem solving, quizzes, projects, and exams.

Grading:

First exam	10%
Second exam	15%
Third exam	15%
Homeworks	25%
Projects #1	7.5%
Projects #2	7.5%
Final Exam	20%
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.

Western New England University
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ME-303 Thermodynamics I
Professor Mehdi Mortazavi
Course Syllabus*
Fall 2016

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

Week	Lecture	Date	Topic	Reading Assignments
1	1	8/30	Introduction / Units / Systems & CVs	1.1-1.6
	2	9/1	Process and Cycles	1.7-1.11
2	3	9/6	Energy and Energy Transfer	2.1-2.5
	4	9/8	First Law	2.6
3	5	9/13	Energy Efficiency and Environment	2.7-2.8
	6	9/15	Phase / Phase Change / Property Diagrams	3.1-3.4
4	7	9/20	Enthalpy / Property Tables	3.5
	8	9/22	Compressibility Factor / Other EOS	3.6-3.8
5	9	9/27	Review Session / Work Problems	-
	10	9/29	**Exam #1 (Chapters 1,2,3)**	-
6	11	10/4	Moving Boundaries / Energy Balances	4.1-4.2
	12	10/6	Specific Properties	4.3-4.5
7	-	10/11	**Fall Recess**	-
	13	10/13	Conservation of Mass	5.1
8	14	10/18	Steady-Flow Systems	5.3-5.4
	15	10/20	Steady-Flow Systems (cont.)	5.3-5.4
9	16	10/25	Review Session / Work Problems	-
	17	10/27	**Exam #2 (Chapters 4 & 5)**	-
10	18	11/1	Second Law / Engines	6.1-6.3
	19	11/3	Refrigeration / Heat Pumps	6.4-6.5
11	20	11/8	Irreversibility / Carnot Cycle	6.6-6.8
	21	11/10	Carnot Heat Engines and Refrigerators	6.9-6.11
12	22	11/15	Review Session / Work Problems	-
	23	11/17	**Exam #3 (Chapter 6)**	-
13	24	11/22	Entropy	7.1-7.4
	-	11/24	**Thanksgiving Recess**	-
14	25	11/29	Property Diagram Involving Entropy	7.5-7.7
	26	12/1	Tds Equations / Entropy Balance	7.13
15	27	12/6	Review Session / Work Problems	-
	28	12/8	Review Session / Work Problems	-
16	-	12/12-12/16	**Final Exam (Comprehensive)**	-

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