ME 0051: Introduction to Thermodynamics

(Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course website and announced in class)

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Office Hours: Tuesdays and Thursdays 11:00am-2:00pm
Teaching Assistant Office Hours: Tuesdays in Room 3-108, 4:30pm-5:30pm

Lecture Times:
Wednesdays in Room 4-202, 9:10am – 11:55am (Section 1), 1:50pm – 4:25pm (Section 2)

Catalog Description: 3 Credits; this course is an introduction into classical thermodynamics to provide an understanding of the basic concepts that relate to thermodynamic systems. Topics covered will include conservation of energy, work, heat, power systems, power cycles, real cycles and ideal cycles. Prerequisites: PHYS 0174, CHEM 0960.

Course Textbooks:
Required Text: Fundamentals of Thermodynamics, 8th Edition, Borgnakke, Sonntag. International Student Version.
Additional Reference: Fundamentals of Engineering Thermodynamics, 8th Edition, Moran, Shapiro.

Course Objectives

- To be able to define and state the first law of thermodynamics.
- To be able to define terms such as heat, work, energy and thermal efficiency.
- Identify and describe various forms of energy.
- Describe and define various forms of energy processes such as heat engines, refrigeration and heat pumps.
- Apply first law analysis to thermodynamic system components
- Apply reversible analysis to a power system
- Apply irreversible analysis to a power system

Course Outline:

Part 1:
Introduction (Ch. 1)
Properties of a Pure Substance (Ch. 2)
First Law of Thermodynamics (Ch. 3)
Part 2:
Energy Analysis of a Control Volume (Ch. 4)
The Second Law of Thermodynamics (Ch. 5)
Entropy (Ch. 6)
Part 3:
Second Law Analysis for a Control Volume (Ch. 7)
Power and Refrigeration Systems (Ch. 9 and 10)

Examination Schedule:

Exam I on Wednesday April 3rd
Exam II on Wednesday May 29th
Final Exam on Wednesday June 26th

Course Grading:

Homework	10%
In Class Studios	20%
Exam I	15%
Exam II	15%
Group Report	20%
Final Exam	20%

Grading Scale: A 10-point scale will be used as a baseline for final grades (A, A- > 90, 89 > B+, B, B- >80, etc.). An additional curve may be applied, as determined by the overall final grade distribution of the class. Grades of A-, B+, B-, etc. will be determined at the instructor's discretion.

Course Schedule:

Week 1	February 27th
	Course Introduction, Ch.1
Week 2	March 6th
	Ch. 2
Week 3	March 13th
	Ch. 3
Week 4	March 20th
	Ch. 3
Week 5	March 27th
	Test 1 Review
Week 6	April 3rd
	Test 1
Week 7	April 10th
	Ch. 4
Week 8	April 17th
	Ch. 4
Week 9	April 24th
	Ch. 5
Week 10	May 1st
	No Class
Week 11	May 8th
	Ch. 5/Ch. 6
Week 12	May 15th
	Ch. 6
Week 13	May 22nd
	Ch. 6/Test 2 Review
Week 14	May 29th
	Test 2
Week 15	June 5th
	Ch. 7
Week 16	June 12th
	Ch.7

Week 17	June 19th
	Ch. 9/Ch. 10/Final Review
Week 18	June 26th
	Final Exam

Class Policies: Regular class attendance is expected and encouraged. Each student is responsible for all of the material presented in class and in the reading assignments. Exams will emphasize treatment of material covered in lectures. In general, no late assignments will be accepted or makeup exams given. Exceptions will be made for a valid excuse consistent with University Policy. If you cannot attend an exam or meet a due date, you must contact the instructor prior to the exam or due date. Arrangements will be made for students on a case by case basis. (Failure to contact the instructor prior to the exam or assignment due date will result in a zero on that exam/assignment.)

Academic Integrity Policy: "Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation in oral or written form. Such violations will be dealt with severely, in accordance with University policy. Plagiarism means representing someone else's idea or writing as if it were your own. If you use someone else's ideas or writing, be sure the source is clearly designated." It is expected that students adhere to the academic integrity policy that is presented in the Student's Honor Code of Conduct / Student Handbook.