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)

Instructor: Professor Sam Ghalambor, Ph.D. P.E.
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Office Hours: Tuesday from 11:00am – 1:00pm

Teaching Assistant: (Sabrina He)
Office Hours: Wednesdays: 11:00 AM-1:00 PM

Course Lecture Times:
Wednesdays , 8:15am – 11:00am

Course 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, energy analysis of closed system, energy analysis of open systems, introduction to thermo cycles, and entropy. **Prerequisites: PHYS 0174, CHEM 0960**.

Course Textbooks:
Required Text: Thermodynamics an Engineering approach, 5th Edition, Yunus Cengel, Michael A Boles.
Reference Text: Fundamentals of Thermodynamics, 9th 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 thermodynamic systems
- Apply irreversible analysis to thermodynamic systems

Course Outline:

Part 1:

Introduction

Properties of a Pure Substance

First Law of Thermodynamics

Part 2:

Energy Analysis of a Control Volume

The Second Law of Thermodynamics

Entropy

Part 3:

Entropy Analysis for a Control Volume

Course Outcome:

1.Students who complete this course are expected to recognize, analyze, and resolve complex engineering challenges by utilizing the principles of engineering, science, and mathematics.

2. Students should be able 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

Examination Schedule: It is a rough estimation but will be announced on BB as the time permits

Exam I on Friday, Oct 26th

Exam II on Friday Nov 30th

Final Exam on the week of Jan 6th

Course Grading:

Homework	10%
Exam I, April 12	25%
Exam II, May 17	25%
Final Exam, June18 week	40%

Grading Scale: The official SCU/SCUPI grading scale will be used when determining final grades and numerical scores based on a student's course average. 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.

ABSENCE POLICY: If a student misses more than four class lectures, they will receive an "F" grade for the course unless they provide a legitimate excuse beforehand.

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.