ME 235 Engineering Thermodynamics I
Winter 2006
Section 01

Class meets: MWF 8:30 – 9:30 1001 EECS

Instructors: Prof. Angela Violi 2150 G.G. Brown avioli

GSI: Sean Bulla bulla

***Course description*:** Introduction to engineering thermodynamics. First law, second law, system and control volume analyses; properties and behavior of pure substances; application to thermodynamic systems operating in a steady state and transient processes. Heat transfer mechanisms. Typical power producing cycles and refrigerators. Ideal gas mixtures and moist air applications.

***Prerequisites*:** Chem 130 General Chemistry, Chem 125 General and Inorganic Chemistry, or Chem 210 and 211, and Math 116 Calculus II.

Textbook: Çengel, Y. A. and Boles, M. A., Thermodynamics: an Engineering Approach, 5th ed., The McGraw-Hill Companies, New York, © 2006.

Course Objectives:

1. To make student familiar with basic concepts, devices and properties used in thermal science;
2. To teach the behavior of a simple pure substance including solid-liquid and gas phases;
3. To teach evaluation of work, heat transfer and power in processes;
4. To teach the formulation of conservation laws for mass, energy and entropy for various physical systems;
5. To teach application of process knowledge to the analysis of complete systems;
6. To make students familiar with how various engines and refrigerators function;
7. To teach the behavior of gas mixtures and moist air.

Course Outcome:

1. Identify different subsystems, indicate where there is work, heat transfer and the importance of temperature, pressure and density;
2. Given a set of properties, find the correct phase and remaining properties for a substance;
3. Given a physical setup, find process and compute associated work/heat transfer that is the most reasonable approximation;
4. Given a physical device and process, compute the work and heat transfer;
5. Given a physical setup, formulate the ideal approximation to the behavior and compute the corresponding work and heat transfer;
6. Given an actual device, analyze the corresponding ideal device;
7. Evaluate performance and power for simple heat engines/refrigerators;
8. Evaluate the energy and water flow involved in a process with moist air;
9. Treat a problem that involves a mixture of gases;
10. To have an understanding of how processes affect the environment.