

ENGRD 221: ENGINEERING THERMODYNAMICS

Lecture 1: August 23, 2007

Reading Assignments (from Moran & Shapiro, Sixth Edition): Sections 1.1, 1.2, 1.3.1, 1.3.2

Topics covered:

- Application areas of thermodynamics
 - Power plants
 - Refrigeration systems
 - Air conditioning
 - Airplanes, turbojet engines
 - Automobile engine
 - Solar-cell arrays
 - Biomedical applications, etc.
- Energy, heat & work: General overview
- Macroscopic versus microscopic viewpoints, statistical versus classical thermodynamics
- Various forms of microscopic energy that make up sensible energy
- Thermodynamic system and its properties
- Thermodynamic state
- Limit of the macroscopic model and assumptions (example of selection of volume in defining density)
- System boundary, system surroundings, universe
- Energetic interactions of a system with its surroundings
- Closed systems and open systems (control volumes)
- Energetic interactions of an open or closed systems with its surroundings
- Open system boundaries: Real/imaginary, stationary/moving
- Examples of open and closed systems
- Thermodynamic processes