

ENGRD 221: ENGINEERING THERMODYNAMICS

Lecture 8: September 18, 2007

Reading Assignments (from Moran & Shapiro, Sixth Edition): Analysis of transient systems (section 4.12) and review of all topics covered in Lectures 6 and 7. On lecture 9, we will be covering chapter 5 (2nd law of thermodynamics).

Topics covered:

- Review of lumped and continuum (integral) formulations of mass balance for open systems
- Review of conservation of energy (1st thermodynamics law) for lumped open systems
- Control surface in a general flow, convected energy, flow work, heat transfer at the control surface, heat flux vector
- The integral energy balance, enthalpy formulation, comparison with the lumped formulation
- Various examples showing applications of energy and mass conservation in the analysis and design of energy system components (please read and practice with ALL examples solved in the textbook in chapter 4)
- An example of transient (non-steady state process), filling process of a closed container, transient mass and energy balances