ME 323, Spring 2008, Thurs. April 3

Homework #1, due Thurs. April 10 beginning class, (text: Incropera & DeWitt, ID)

Reading (ID) 1.1, 1.2, 1.3.2, 1.3.3, 1.4-1.7, all Chapter 2 (be comfortable with summaries in Chpt 1 and 2)

- Three modes of heat transfer
- Resistance analogy: Conduction, Convection, Radiation
- Steady state applications with given properties
- Conduction: Heat rate equation (Cartesian, polar coordinates), boundary conditions

Problems (ID):

Conduction:
1.3, 1.4, 1.8

Convection:
1.13, 1.17,
1.20: Provide sketch with all need diagnostics and show how measurements would be used to compute h. (No numbers needed, call chip dimension a by b despite problem suggesting 10mm on a side.) Your description should be in concise but complete sentences.

Radiation:
1.24, 1.28,
1.29: For small differences in surface and surroundings temperature the resistor analogy for radiation is a useful tool. This problem requires a spread sheet and is good to get a feel for when the resistor analogy goes south for radiation problems (see section 1.2.3)