

# ES 312 Energy Transfer Fundamentals

## Introduction to Thermodynamics and Heat Transfer

1/6/2006

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### Course Requirements

- Homework - 10%
  - Used primarily as an aid for your learning
  - Group work strongly encouraged. That doesn't mean copying others mistakes!
- Mid-term Exams - 3 at 20% each
  - Closed book, one cheat sheet, individual effort
- Final - 30%
  - Open book, comprehensive, individual effort

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### Semester Topics

- Text: **Heat Transfer**, J.P. Holman, 9th Edition

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| <ul style="list-style-type: none"><li>• Thermodynamics:<ul style="list-style-type: none"><li>- Physical Properties</li><li>- System Concepts</li><li>- Work and Heat Processes</li><li>- 1st and 2nd Laws of Thermodynamics</li><li>- Entropy Concepts</li><li>- Cycles (time permitting)</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Heat Transfer<ul style="list-style-type: none"><li>- Conduction in Solids/Nonmoving Fluids<ul style="list-style-type: none"><li>• 1-Dimensional</li><li>• Multi-Dimensional</li><li>• Unsteady</li></ul></li><li>- Convection in Fluids<ul style="list-style-type: none"><li>• Forced</li><li>• Natural</li></ul></li><li>- Radiation<ul style="list-style-type: none"><li>• Radiation Basics</li><li>• Radiation exchange between bodies</li></ul></li></ul></li></ul> |
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## Motivation

- What do you expect to learn?
- Why is this material important to engineers?
- Why is it important to an EE?
- What value with this course have to you later?

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