

## **MEEG 463 Advanced Heat Transfer (Spring 2011)**

**Lecture** Monday 1:30-3:45 pm, Mandeville 308  
**Instructor** Dr. Junling (Joyce) Hu, Assistant professor  
Tech. 133  
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Email:jjhu@bridgeport.edu

**Office Hours** Open door policy all day; scheduled office hours: Wednesday 2:30-4:30 pm and Thursday 10:00am-12:00pm

**Textbook** Yunus A. Cengel, Heat and Mass Transfer: Fundamentals and Applications, 4<sup>th</sup> Edition, McGraw-Hill, 2010. ISBN 0077366646.

### **References**

1. Faye C. Mcquiston, Jerald D. Parker, Jeffery D. Spitler, Heating, Ventilation, and Air Conditioning – Analysis and Design, 6<sup>th</sup> Edition, John Wiley & Sons, Inc., 2005. ISBN 0471470155.
2. J. P. Holman, Heat Transfer, 9<sup>th</sup> Edition, McGraw-Hill, 2002. ISBN 0072406550.

### **Course Description**

This course provides a physical understanding of fundamental heat and mass transfer phenomena with the aid of FlowLab as a virtual laboratory. The course includes steady and transient heat conduction in one-dimensional and two dimensional solids, finned surfaces and multi-dimensional objects; free and forced convection for laminar and turbulent flows in ducts, over flat plates and blunt bodies, and through tube bundles and packed beds; film condensation and boiling; heat exchangers; radiation exchange between surfaces; diffusion mass transfer; and numerical methods in heat conduction.

### **Course Objectives**

At the end of the course, a successful student should be able to:

1. Understand how to model heat transfer processes
2. Perform basic heat transfer calculations
3. Recognize interaction of design variables on performance
4. Communicate the results of their work, both orally and in formal written reports.

### **Course Outline**

1. Basics of heat transfer
2. Heat conduction
3. Numerical methods in heat conduction
4. Convective heat transfer
5. Radiative heat transfer
6. Heat exchangers
7. Mass transfer

## **Grading**

Quiz/participations	20%	First exam	15%
Second exam	20%	Final exam	25%
Project/participation	20%		

## **Grading Policy**

Homework – Homework problems will be assigned and solutions will be given in Blackboard. You are expected to work on the homework problems first and check with the solutions by yourself within a week.

Quizzes – In-class quizzes will be given throughout the semester to encourage students to keep up-to-date with the material, and to ensure that the lectures are effective. The quizzes will be based on the homework assignments and class lectures. They will take approximately 10 minutes. They might be given at the beginning of a class or at the end of a class. No provision will be made to make-up any quiz. If you miss a quiz, you will receive a 0 grade for that one.

Exams – Mid-term and final exams will cover material from the lectures and homework. Make-up exams may be given to those students who submit a written request to the instructor no less than 3 days prior to the exam. Emergency or unexpected issues related to make-up exams will require proper documentation.

Project – Project involves a detailed simulation of a heat conduction problem. You may choose from a list of projects that have already been identified, or, with instructor approval, you may create your own project. Your final project report will include citation of relevant literature, and a report summarizing the results of the detailed analysis you performed. Each student will give a brief presentation on their project to the entire class.

## **Code of Conduct**

You are responsible for keeping up to date with the course materials posted on the Blackboard site: <http://blackboard.bridgeport.edu/>

You are expected to attend class during the scheduled times, except in unusual circumstances. You will not be able to keep up with the class if you do not attend.

It is the student's responsibility to familiarize himself or herself with and adhere to the standards set forth in the policies on cheating and plagiarism as defined in Chapters 2 and 5 of the Key to UB <http://www.bridgeport.edu/pages/2623.asp> or the appropriate graduate program handbook.

## **Note**

I reserve the right to make adjustments to the syllabus during the semester.