Vm530 Advanced Heat Transfer

Summer 2017 Course Syllabus

Class Schedule

MW 16:00-17:40 CRQ306

Instructor

Prof. Bao, Hua

Room 417, JI Building
Office Hour: Th 10:00-11:00
hua.bao@sjtu.edu.cn
Meeting outside office hours by email appointment only

Textbook (required)

Principles of Heat and Mass Transfer **Seventh Edition** by Frank P. Incropera, David P. DeWitt, Theodore L. Bergman, Adrienne S. Lavine, ISBN: 978-0-470-64615-1

Note: feel free to use the sixth edition of this textbook, but all the homework assignments are based on the seventh edition.

Course Outline

Vm530 is a graduate level core course in heat and mass transfer that may be taken for graduate credits. The prerequisite for this course is Vm335 or an equivalent undergraduate course in heat transfer. As in Vm335, there is a balanced coverage of the three basic transport modes: diffusion, convection, and radiation. However, these topics are treated in greater depth, and students leave Vm530 with a better appreciation of the underlying fundamentals and with improved analytical skills. The specific objectives of the course are:

- To enhance the understanding of heat and mass transfer processes
- To strengthen analytical skills and the ability to cope with complex problems
- To provide experience in treating multimode heat and mass transfer processes

Scope of the Course

Heat and mass transfer by diffusion in one-dimensional, two-dimensional, transient, and phase change systems. Convective heat transfer for external and internal flows. Similarity and integral solution methods. Heat, mass, and momentum analogies. Turbulence. Buoyancy driven flows. Convection with phase change. Radiation exchange between surfaces and radiation transfer in absorbing-emitting media. Multimode heat transfer problems.

Grading Policy

In-class Participation 5%
Homework 10%
Mid-term 40%
Final 45%

Unethical Conduct

Communication between students in the solving of homework problems is encouraged. However, each student is expected to do his/her own work in satisfying the homework problem requirements, without using any materials that the instructors do not intend to have the students have, such as the homework solution manual which is strictly prohibitive. Any student detected of cheating on homework or examination will be reported to the honor council.