MEC 305: Heat and Mass Transfer
Spring 2018

Instructor: Prof. David Hwang (david.hwang@stonybrook.edu)
222 Heavy Engineering Building

Teaching Assistants: Zhongnan Ran (in charge of recitation; zhongnan.ran@stonybrook.edu),
and Priya Priyadarshini (HW grading; Priya.Priyadarshini@stonybrook.edu)

Lectures: MWF 10:00-10:53am (102 FREY HALL)

Recitation-01:   M 09:00-09:53am (E4320 MELVILLE LBR)
Recitation-02:   W 09:00-09:53am (E4320 MELVILLE LBR)

Office Hours: Mon 1pm-4pm (222 Heavy Engineering)

Prerequisites: MEC 301 and MEC 364

Required Text: Yunus Cengel and Afshin Ghajar, *Heat and Mass Transfer: Fundamentals & Applications*, 5th Ed., McGraw-Hill, 2015.

Homework: Homework to be assigned either weekly or biweekly.
Assignments will be due by the end of class a week after they are assigned, unless otherwise stated. Late homework will receive half credit until the solutions are posted and will <u>not</u> be accepted after that.

Exams: Two midterms (dates TBD)
One final exam (date following regular final exam schedule).
No makeup exams, unless arranged <u>prior</u> to the exam.

Grading: (Subject to minor adjustment)

Homework:	15%	(due by one week)
Midterm I:	20%	(~5-6th week; TBD)
Midterm II:	20%	(~8-9th week; TBD)
Final:	45%	(regular final exam schedule)

Course Outline:
1. Basic Concepts of Thermodynamics and Heat Transfer
2. Heat Conduction
    Heat Conduction Equation
    Steady Heat Conduction
    Transient Heat Conduction
3. Convection
    Fundamentals of Convection
    Forced Convection
    Natural Convection
4. Radiation Heat Transfer

Course Learning Objectives:

1. Demonstrate the ability to identify the three modes of heat transfer: conduction, convection, and radiation, and solve simple multi-mode heat transfer problem.
2. Demonstrate the ability to formulate and solve the differential equation of heat conduction in various coordinates systems with proper thermal boundary conditions.

3. Demonstrate the ability to develop thermal resistance networks for practical heat conduction problems.
4. Demonstrate the ability to solve transient lumped-parameter heat conduction problems.
5. Demonstrate the ability to analyze convective heat transfer in boundary layer and internal pipe flows based on Newton's law of cooling.
6. Demonstrate the ability to analyze radiative heat transfer between nonblack surfaces.

Blackboard: All homework assignments and solutions will be posted on the Blackboard course account (http://blackboard.sunysb.edu). For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

All communication off class/office hours will be done exclusively through Blackboard. Blackboard uses your official Stony Brook e-mail address. It is your responsibility to check this e-mail address regularly, so that you do not miss any important announcements.

Allowed Calculators: Following the Mechanical Engineering Department's mandatory calculator policy, only the following calculators will be allowed to be used on the midterm and final exams. There will be no exceptions. This list of calculators is identical to that allowed for the *National Council for Examiners for Engineering and Surveying* (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better.

Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name.
Hewlett Packard: The HP 33s and HP 35s models, but no others.
Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

The NCEES policy on calculators can be found here:
http://www.ncees.org/exams/calculators/

Disability Support Services (DSS) Statement: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities.

Academic Integrity Statement: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/.

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.