

# MEC 501\_\_Convection

Jan., 2018  
Tu 4PM to 6:50PM\_???

Spring 2018: office hours\_TUE and WED 11AM to 1PM

**Course Description:** Differential and integral formulation. Exact and approximate solutions. Topics include parallel and boundary layer flows, similarity solutions, external and internal flows, laminar and turbulent convection, and forced and free convection.

*Spring, 3 credits, ABCF grading*

**Learning Objectives:** This course is designed for students to acquire the ability of estimating convective heat transfer rate of engineering systems and man-made systems, and to be prepared for conducting independent research project in convective heat transfer problems.

**Prerequisites:** None

**Textbook:** *Convection Heat Transfer* by Adrian Bejan, 3<sup>rd</sup> edition (J. Wiley and Sons, New York 2004).

## Course Topics:

1. Fundamental Principles (Bejan, Chapter 1: **Jan. 23**)
2. Laminar Boundary Layer Forced Convection (Bejan, Chapter 2: **Jan. 30, Feb. 6, Feb.13**)
3. Laminar Duct Flow Forced Convection (Bejan, Chapter 3: **Feb. 20, Feb. 27**)

**First midterm (3/6)** [Take-home test \_materials from fundamental principles and laminar boundary layer forced convection]

*March 14: spring recess*

4. Natural Convection (Bejan, Chapter 4: **March 20, Mar. 27**)

**Second midterm (4/10)** [open book \_materials from laminar duct flow forced convection and free convection (natural convection)]

5. Turbulent flows (Bejan, Chapters 7 and 8: **April 3, April 17**)
6. Field synergy principle (**April 24**)

**Final Examination (May 1, Tuesday: 4:00 to 6:50PM)** [open book \_ comprehensive]

## Grades:

Homework	5 points [I will collect the homework but will not return them back to students (keep a copy for yourself)]
Two section tests	28 points each
Final Exam	39 points

Please note: the 1<sup>st</sup> take-home-test date is tentative—it may be moved to either 03/20 or 03/27.

### **Americans with Disabilities Act**

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

### **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.

### **STATEMENT ON ACADEMIC DISHONESTY**

Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, *but are not limited to*, copying or plagiarizing class assignments including homework, reports, designs, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted to the fullest via the CEAS CASA committee. For you, the honest student, academic dishonesty results in lower class curves, hence a depression in your GPA and class standing, while cheapening the degree you earn.