MEC 509__Transport Phenomena (TP)  Aug. 28, 2019
   Wed., 4PM_Social/Behavior__N-101
Office hours: **MW 11:00AM to 12:30PM** (Office: Room 214, Heavy Engrg.)

**Course Description:** Introduction to differential and integral formulation of mass, momentum, and energy transport in fluids and solids. Topics include viscosity, laminar flow, boundary layer flow, turbulent flow, friction factor, conduction, convection, heat transfer coefficients, radiation, and applications to energy technology.

*Fall, 3 credits, ABCF grading*


**Course Topics:**

1. **Introduction:** the commonalities among heat transfer, mass transfer, and fluid mechanics
2. **Shell Momentum Balances and Velocity Distributions in Laminar Flow / Equations of Change for Isothermal Flow Systems**
   - [Chapters 2 and 3 are treated together](#)
3. **Velocity Distributions with More than One Independent Variable and Boundary Layer Theory**
   - [Chapter 4](#)
4. **Velocity Distributions in Turbulent Flow**
   - [Chapter 5](#)
5. **Inter-phase Transport in Isothermal Flow Systems and Boundary Layer Flow with Separation**
   - [Chapter 6](#)
6. **Temperature distribution in solids and in laminar flow / Equations of Change for Non-isothermal Systems**
   - [Chapters 10 and 11 are treated together](#)
7. **Temperature Distributions with More than One Independent Variable**
   - [Chapter 12](#)
8. **Temperature distributions in turbulent flow**
   - [Chapter 13](#)
9. **Energy transport by radiation**
   - [Chapter 16](#)

**Week-Date**

1-08/28
1 & 2-08/28 & 09/04
3 & 4-09/11 & 09/18
5-09/25
6-10/02
7-10/09
8 & 9-10/16 & 10/23
10 & 11-10/30 & 11/06
12-11/13
13-11/20
14-12/04

**Final Examination** (Dec. 11, class time [last class]) [comprehensive, from #2 to #8, open book]
Grades:

- Two section tests: 30 points each
- Final Exam: 35 points
- Home-work*: 5 points

Note that materials of the two midterms (section tests) are based on the TP Solution Manuel and the tests are closed book. The final examination is open book.

* I will collect the homework but will not return them back to you (keep a copy for yourself for each submission). The solutions from TP Solution Manuel will be made available in due time; you'll get full credit as long as you turn in every home work.

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, ECC(Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. [http://studentaffairs.stonybrook.edu/dss/index.shtml](http://studentaffairs.stonybrook.edu/dss/index.shtml).

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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 University Community Standards 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. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.