

**THE UNIVERSITY OF TEXAS AT EL PASO**  
**COLLEGE OF SCIENCE**  
**DEPARTMENT OF PHYSICS**

Course #: PHYS 4393  
Course Title: Special Topics: Fluid Dynamics  
Credit Hrs: 3  
Term: Fall 2012  
Course Meetings & Location: TR 10:00 am – 11:20 am, PSCI 216  
Prerequisite Courses: PHYS 2420, PHYS 2230, MATH 2326  
Course Fee: (if applicable)  
Instructor: Dr. Huiyan Yang  
Office Location: PSCI 215B  
Contact Info: Phone # 915-747-7510  
E-mail address hyang4@utep.edu  
Fax # 915-747-5447  
Emergency Contact # 915-747-5536  
Office Hrs: TR 9:00 am – 9:50 am, or through appointment  
Textbook(s), Materials: Required: Fluid Mechanics, 4<sup>th</sup> or 5<sup>th</sup> Ed., Kundu and Cohen  
Suggested: Introduction to Fluid Mechanics, Fay, 1994  
Course Objectives (Learning Outcomes): Develop an understanding and attain knowledge of fluid dynamics fundamentals. Gain skills and abilities to apply fundamental laws in fluid dynamics to natural science or engineering problems. Learn to solve fluid dynamics problems analytically and numerically.  
Course Activities/Assignments: Course activities include reading assignment, lectures, homework, midterm exam, and a final exam.  
Assessment of Course Objectives: Outcomes will be measured by homework and exams.  
Grading Policy: Grades will be calculated using the following weights:  
Homework 40%; Midterm 30%; Final Exam 30%  
Make-up Policy: No credit will be given to missed homework. Attendance at exam is mandatory. Make-up exams can be arranged at the discretion of the instructor. A written excuse will be necessary for rescheduling an exam.  
Attendance Policy: Attendance in class is the responsibility of the students. If class is missed, you are responsible for obtaining the notes from another student or from the instructor.  
Academic Integrity Policy: Acts of academic dishonesty will not be tolerated in this class. Lapses in academic integrity will be referred to the Dean of Students, as required at <http://academics.utep.edu/Default.aspx?tabid=23785>.  
Civility Statement: This course requires positive behaviors: Be on time and be focused on your work. Please do not distract yourself or others with telephones or music.

**Disability Statement:** If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

**Military Statement:** If you are a military student with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact me as soon as it appears that your service will interfere with this course. The instructor will work with you to ensure that your service will not adversely affect your academic progress.

**Course Schedule:** Tentative List of Topics: may change with class activity

1. Introduction and Classical Thermodynamics
2. Fluid Statics
3. Kinematics
4. Inviscid Flow: Euler Equation and Bernoulli's Equation
5. Fixed (Control) Volume Theorems
6. Navier-Stokes Equation and Viscous Flow
7. Similarity and Dimensional Analysis
8. Vorticity and Circulation
9. Irrotational Flow
10. Boundary Layers
11. Introduction to Turbulence