

SYLLABUS - CE319F

ELEMENTARY MECHANICS OF FLUIDS

Unique #: 15617, 15618, 15619, 15621
Room: ECJ 5.410

Fall 2007
T Th 9:30 to 10:45 a.m.

Instructor Information

Professor:	Richard L. Corsi, Ph.D.	Office Hours	T Th – 2:10 to 4:00 p.m.
Office:	ECJ 9.102E	Email:	corsi@mail.utexas.edu
Phone:	471-3611		

Pre-Requisites

EM 306 (or EM 306S) - Static Mechanics. EM 306 has as pre-requisites M 408D and Physics 303K/103M. Students will be expected to draw on materials from these courses in CE319F.

Textbook Information

Yunus A. Cengel and John M. Cimbala, *Fluid Mechanics: Fundamentals and Applications*, 1st edition 2006.

The following website relates to your textbook: http://www.mne.psu.edu/cimbala/Cengel_Cimbala_book/

This website contains an *errata sheet* for typographical errors in the book. You are highly encouraged to download the errata sheets and to make corrections to your book.

Exam Schedule

Exam 1: Oct 4, 2007 9:30 to 10:45 a.m.	Exam 2: Nov 8, 2007 9:30 to 10:45 a.m.	Final Exam: Dec 13th, 2007 2:00 p.m. to 5:00 p.m.
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Teaching Assistants

This course has been assigned a Teaching Assistant (TA). The TA will coordinate laboratory sessions. The course has also been assigned a tutor who will hold office hours (see Office Hours below). A homework grader has also been assigned. Students should not consult the grader. Please see me (Corsi) if you have questions about the grading of a homework assignment.

Office Hours

Professor: I strongly believe in the benefits of meeting with students in small groups, and encourage every student to visit during my office hours to discuss homework problems, general course concepts, and other issues related to the engineering profession or education. **Office hours will be T and Th from 2:10 to 4:00 p.m.** I often work problems with groups of students in my office or the small conference room near my office.

Tutor: We also have a tutor for the course (name to be provided in lecture). She will be available five hours each week (W 12:30 to 3:00 p.m., Th 11:00 – 12:00, and F 1:30 to 3:00 p.m.) to tutor students on concepts related to lecture/homework material.

Course Overview and Objectives

Fluid mechanics is a basic engineering science that covers materials which is fundamental for civil, architectural and environmental engineers. Fluid mechanics is essential to understanding phenomena related to the movement and forces established by and on fluids such as air and water, for designing systems that employ these fluids, and for predicting the transport of pollutants in fluid streams, e.g., rivers, oceans, buildings, and the outdoor atmosphere.

The course description from the Undergraduate Catalog is “*Fluid properties, hydrostatics, elements of fluid dynamics, energy and momentum, boundary layers, similitude, pipe flow, metering instruments, drag forces.*” Specific topic areas that will be covered in this course include: properties of fluids, pressure, fluid statics, fluid kinematics, conservation of fluid mass and energy, dimensional analysis and similitude, and closed conduit flow. Time permitting we will also cover drag forces and applications related to building air.

The intent of this course is to provide an introduction to the field of incompressible fluid mechanics; some compressible flow phenomena will also be discussed, but primarily to show the contrast between incompressible and compressible flows. Students should become familiar with a breadth of topics related to fluid mechanics, thus allowing for more in-depth analyses in CE356 (hydraulics) and 4th-year elective courses. Students should also become more familiar with the types of problems that involve elementary fluid mechanics, and should be able to identify the intellectual tools (fundamental concepts) that are available to address these problems. Many of the “tools” that students gain from this course should be directly applicable to future problem solving as a practicing engineer, and students should be aware that many of the types of lecture examples and homework problems in this course will be similar to problems on the Fundamentals of Engineering exam. Fill your intellectual toolbox. It will come in handy throughout your career.

Homework Policies

Homework submittal

Homework is due **by 3 p.m.** in *ECJ 8.6 (CE319F Corsi HW box)* each Wednesday and Friday (unless a different time for submission is specified by the instructor). This schedule is intended to allow for students to review assigned problems and to ask me (Corsi) or the course tutor for assistance prior to the due date. It is also designed not to penalize any students who have a laboratory during the assignment submission deadline. Due dates for each assignment are listed on the attached CE319F lecture and homework plan. I will **not** accept homework delivered under my door, in campus mail, or by email. Note that ECJ 8.6 is only open during the normal M-F workday, so plan accordingly.

Notes on Homework Assignments

- The instructor may subtract or substitute problems as deemed necessary during the course of the semester.
- The schedule for course topics and assignment due dates may be revised and updated during the semester (if we fall behind or get ahead). The instructor will provide students with an updated course outline/schedule on our Blackboard site if and when this occurs.

Homework format

The format for submitted homework will mimic the expectations of a professional workplace. An engineer’s job is not done unless the steps to the solution of a problem are adequately communicated so that someone else can evaluate the work. All homework must be submitted on standard **engineering paper** and must be neatly handwritten. The student’s **name must be in the upper right-hand corner of every page**, along with the **homework assignment number** and **page number**. Multiple pages of homework must be stapled in the upper left-hand corner.

Each homework problem must contain (1) a problem statement, (2) a sketch of the problem (where appropriate), (3) labels and definitions for all known and unknown quantities, (4) governing equations and any manipulations of governing equations required to get the solution, and (5) substitution of dimensional quantities (with units) into equations for the final answer. **Homework must be neat.** Solutions must be presented in an orderly fashion; anyone should be able to understand your solution six months or six years later. All equations must be written in general symbol form before specific numerical values are substituted into the equations. All dimensional quantities (in the given information and solution) must have the appropriate units following the numbers through the solution steps. Final answers must be clearly marked (underlined, boxed, or arrowed).

Homework Grading and Policy

Points will be assigned for each homework problem as follows:

- (a) Clear and complete presentation with correct answer - 10 points
- (b) Clear and complete presentation (generally correct approach) with incorrect answer - 7 points
- (c) Honest attempt but clearly incorrect approach and answer – 5 points
- (d) Poor attempt or solution altogether missing - 0 points

A penalty of up to 2 points per problem may be assigned for failure to follow the guidelines listed above (see *Homework Format*).

Homework that is late for any reason will be penalized 30% of the homework grade, provided that it is submitted by 3 p.m. on the day after (Thursday or Monday) the original submittal deadline. Homework assignments will not be accepted after this time.

Cooperation on homework assignments

Students may work together on homework assignments; however, each student must turn in an original handwritten set of solutions.

Importance of Homework and Need to Keep Up

Each student is expected to complete homework assignments. If a student fails to score at least 60% on the cumulative homework mark he/she will be ineligible to receive a mark of C or higher in the course. *Do your homework and keep pace in the course!*

Exam Policies

There will be two exams during the semester and a comprehensive final exam. Exam dates and times are listed earlier in this syllabus and in the course/topic outline. The exams will be closed book and closed notes. However, each student will be allowed to bring one (1) ***hand written*** 8.5 inch x 11 inch sheet of paper to the first exam, two to the second exam, and three to the final exam. Each side of the paper may be written on. These sheets **MUST** be submitted with the exam, and will be returned to students with graded exams. Conversion factors, physical properties of fluids, and trigonometric formulas will be provided on the exam as needed. Students are required to perform calculus level mathematics on each exam. The second exam will be comprehensive, but will weigh more heavily on material covered after the first exam. The final exam will be comprehensive.

Prior to the end of an exam, the time remaining on the exam will be announced. You **MUST** submit your exam at the announced end time. I will leave the room shortly after the announced end time. Absolutely no exam or exam material will be accepted after I leave the room.

Medical illness (or comparable situation such as a death in the family) will be the **ONLY** excuse for being given an opportunity to complete a make-up exam. In these cases, definitive evidence of circumstance (letter from

doctor, etc.) must be provided to me. If you miss an exam for reasons other than medical illness (or comparable situation) a grade of zero will be assigned to the exam. There will be NO exceptions to this policy.

If, after an exam has been graded and returned, you have questions about the grading, you must write your questions or comments on a separate sheet of paper and submit these questions/comments to me along with the graded exam. Exams will be accepted for re-evaluation for up to 10 calendar days after the exam is returned (no exceptions). Final exams will not be returned. Students may view the final exam by appointment.

Laboratory Policies

You should assume that there will be a laboratory every week but the first week of the semester. However, there will be some weeks in which there will not be a laboratory. If a laboratory will not be held I will announce this fact in lecture the Thursday before, and will also post the information on the course Blackboard website. Materials necessary for laboratory completion will also be posted on the Blackboard website and should be downloaded prior to attending your assigned laboratory.

Attendance Policies and Student Participation

Lectures: Attendance is expected, but will not be formally documented. Be warned that poor attendance is likely to adversely affect your grade in this course, particularly as related to performance on exams. There is substantial empirical evidence to back up this statement.

Laboratories: The laboratory component accounts for 10% of the course mark. It is an “easy” 10% if you attend. Attendance is required. The teaching assistant will monitor attendance for each laboratory. A penalty of 1.5% (absolute) to the final mark will be assigned for each lab session that a student fails to attend, up to a total of 10% (maximum). If a student fails to complete four or more laboratories, s/he will be ineligible for a grade of C or higher in the course. Furthermore, it is not beyond reason for a question about one or more laboratories to show up on an exam.

Grading Policies

Basis of grading in this course:

* Homework	15%
* Laboratory	10%
* Exam 1	20%
* Exam 2	25%
* Final Exam	30%

Letter grades will be assigned as follows[#]:

* A	90 – 100%
* B	80 – 89.5%
* C	65 – 79.5%
* D	55 – 64.5%
* F	< 55%

I reserve the right to lower the letter grade cut-offs. They will not be increased.

There is no set grading curve in this course. If every student earns an A mark, every student will receive an A mark. The key word is “earns”. You will need to work hard in this course to earn a good grade. We will cover a lot of material and the course is homework intensive. Falling behind in this course or not working hard generally leads to a poor grade. Supplementary (extra credit) work will not be given in this course.

Scholastic Dishonesty Policy

I have a strong belief about personal responsibility and ethical academic behavior. Any student who is found to engage in unethical behavior related to this course, including the acts of cheating on exams or laboratories, tampering with other student’s assignments, plagiarism, etc., will be penalized in accordance with the severity of the act. Penalties may be as severe as receipt of zero on assignments or exams, failure of the course, or worse. The official Cockrell School of Engineering policy is that students who violate University rules on scholastic

dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. **Work hard. Be honest. Explore. Learn.**

For further information see: <http://deanofstudents.utexas.edu/sjs/>.

Access to Computers

All students registered in this course must have an email account on the university network. You may use your existing account or you may obtain a University email account. I will be communicating via email with the class a lot (you might even get sick of me). You are expected to check your email on a regular basis. Please include CE319F on the subject line of any email that you send to me – this will ensure your email will not get thrown out as spam.

Additional materials for this course will be on the course Blackboard site. The course syllabus, handouts, assignments, and PowerPoint presentations are examples of the types of information that may be available on this site.

The Department of Civil, Architectural and Environmental Engineering has a microcomputer laboratory, the Learning Resource Center (LRC) on the third floor of ECJ. The LRC is available for you to use. Assistants in the LRC are there to operate the microcomputer laboratory and to respond to specific software and hardware problems. Typically, LRC assistants do not have detailed knowledge of material related to CE319F and should not be consulted on course-specific material

Course/Instructor Evaluations

During one of the two final meeting periods of the semester students will have an opportunity to evaluate this course and the instructor using approved MEC forms. These forms will be distributed and collected by a student in the class. I will not be present when the forms are being completed. All students are encouraged to complete the MEC forms. I am also very receptive to suggestions by students during the semester.

Students with Disabilities

The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Services for Students with Disabilities area of the Office of the Dean of Students at 471-6259 as soon as possible to request an official letter outlining authorized accommodations, or TTY at 471-4641, or the College of Engineering Director of Students with Disabilities at 471-4321.

Cockrell School of Engineering Drop Policies and Important Dates

From the 1st through the 12th class day, an undergraduate student can drop a course via the web and receive a refund. From the 13th through the 20th class day, an automatic Q is assigned, no refund; approval from the Dean and departmental advisor is required. From the 21st class day through the mid-semester deadline, approval is required from the Dean, instructor of the course and departmental advisor.

Some additional and important dates extracted from the 2007/2008 academic calendar:

September Tuesday. Last day of the official add/drop period; after **4** this date, changes in registration require the approval of the department chair and usually the student's dean. (See [General Information, chapter 4](#), for required approvals.)

Last day undergraduate students may register and pay tuition and fees without the approval of the registrar.

September Friday. Twelfth class day; this is the date the official **14** enrollment count is taken.

Last day an undergraduate student may add a course except for rare and extenuating circumstances.

Last day to drop a course for a possible refund. (See [General Information, chapter 4](#), for required approvals.)

September Wednesday. Last day to drop a course without a possible **26** academic penalty. (See [General Information, chapter 4](#), for required approvals.)

November Thursday-Saturday. Thanksgiving Break.
22-14

October 24 Wednesday. Last day an undergraduate student may, with the dean's approval, withdraw from the University or drop a course except for urgent and substantiated, nonacademic reasons.

Last day a student may change registration in a course to or from the pass/fail or credit/no credit basis.

December 7 Friday. Last class day except in the School of Law.