

ENGR 333 - Fluid Mechanics- Spring 2009

Lecture: MWF 8-8:50 in FH 111
Lab Section 1: Tues 8-10:50 in JH 214
Lab Section 2: Thurs 8-10:50 in JH 214

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ENGR 333 is a required course for the Environmental Resources Engineering BS degree.

Office Hour Schedule

Office hours will be held in my office (HGH 114) at the following times:

Monday: 9 - 11

Tuesday: 1 -2

Wednesday: 9 - 11

Thursday: 12 - 2

My complete schedule can be found at: <http://www.humboldt.edu/~mm11>. This schedule indicates additional times that are available for appointments. Appointment times must be scheduled in advance. I will not be available at those times unless you make an appointment.

Course Information

Fluid Mechanics covers the following topics: fluid properties, fluid statics, flow concepts, control volume analysis, continuity, energy and momentum concepts, boundary layer concepts, drag theory, flow measurements; flow in pipes and ducts, open channel flow, dimensional analysis and similitude. Engineering design applications in hydraulics will also be introduced.

This course integrates lecture, discussion, problem solving, and hands-on laboratories.

Pre-requisites for ENGR 333 are ENGR 211 and ENGR 325. ENGR 333 may be taken before, concurrent with or after ENGR 331.

A minimum grade of C- is needed for ENGR 333 to be counted towards the ERE BS degree.

Course Text

Fluid Mechanics
Frank M. White
McGrawHill

You may use either the fifth or sixth edition of the course text. The primary difference between them is the problems at the back of each chapter. Purchasing a new copy of the 6th edition also

gets you access to online supplemental learning materials. These are not required but some students may find them useful.

Supplemental reading materials will be distributed in class or via Moodle at no additional cost to the student.

Additional materials and fees: There is a \$20 laboratory fee that supports the laboratory section of this course.

Student Learning Outcomes

ENGR 333 addresses the following ERE Student Learning Outcomes:

- I. ERE graduates will be able to apply the tools and concepts of mathematics, basic sciences, and engineering science in engineering practice.
- II. ERE graduates will be prepared and understand the need to continue their life-long education in mathematics, basic sciences, and engineering science, design, and practice.
- IV. ERE graduates will be able to effectively and professionally communicate ideas and technical information to the public and to fellow and other professionals in written and oral reports.
- V. ERE graduates will have the ability to design systems, components, processes and procedures to meet specified objectives, with an emphasis on designs for managing environmental resources.
- VII. ERE graduates will be able to work effectively in multi-disciplinary teams and, when necessary, to pro-actively resolve problems with team dynamics.
- VIII. ERE graduates will be prepared for graduate school based upon their experience with independent research, technical writing, statistical analysis, and computational methods.
- IX. ERE graduates will be prepared to assume a leadership role in the profession based upon their engineering science and design experience with traditional and nontraditional solutions to environmental problems.
- X. ERE graduates will have a professional attitude and ethical responsibility to their client and their community in terms of the legal, economic, technical, and the environmental aspects of their role.
- XII. ERE graduates will have the ability to identify, formulate, and solve engineering problems.

Course Requirements and Grading Criteria

Performance in ENGR 333 is evaluated using a combination of your exam, homework, laboratory report and quiz scores weighted as shown in the table below. Grades are posted on the course Moodle site as soon as possible and you are encouraged to periodically check these grades and

monitor your course progress. Final letter grade assignments are generally assigned on the scale shown below.

Grade Component Weights

Homework	10 %
Labs	15 %
Quizzes (lowest score dropped)	20 %
Midterms (2)	40 %
Final	15 %

Grading Criteria

A	92 or above
A-	90 – 91
B+	88 – 89
B	82 – 87
B-	80 – 81
C+	78 – 79
C	72 – 77
C-	70 – 71
D	<69.5
F	<55

Incomplete grades are not assigned unless you have documented extenuating circumstances. If you anticipate needing an Incomplete grade, please discuss with me as soon as possible.

Exams

Midterm exams are scheduled during the laboratory section as indicated on the course calendar.

The final exam will be given during the assigned final time for the course: Friday, May 15, 2009 from 8:00 - 9:50.

Quizzes

Quizzes are given approximately weekly at the beginning of the laboratory period on Fridays. The schedule of quizzes is shown on the *Course Calendar*.

Homework

Homework is assigned on Fridays and due on the following Friday. All homework must be handed in at the beginning of the class period on the day it is due. **Homework handed into any other location will not be accepted.** Class will start promptly, and NO MATERIAL MAY BE HANDED IN WHILE THE CLASS IS IN SESSION.

Late Homework is not accepted without advance arrangement and a good reason.

Homework will be returned on Mondays to help you prepare for quizzes.

All homework assignments should be neat and legible. Do not submit pages with ragged "tear-out" edges from spiral notebooks. Staple all pages together - do not use paper clips or folded corners. I may deduct credit for sloppily prepared homework or refuse to accept it.

I encourage questions about homework assignments and will offer help in office hours or by email.

Laboratories

Attendance at all laboratory sessions is mandatory. If you will miss a lab session, you must contact me *{preferably in advance}* to arrange a make up or alternate exercise. Failure to attend and participate in any lab session will result in a grade penalty even if the lab is not graded (e.g. missing a problem session results in a deduction from your laboratory grade). Details about specific laboratory activities and report requirements will be posted on the course Moodle site and distributed during the appropriate laboratory sessions.

Make-Up Policy

Make-ups for labs, quizzes and exams will only be given in extraordinary situations that are verifiable and well documented. I will decide whether an excuse is acceptable. One criterion for acceptance of any excuse will be its timeliness. Therefore, whenever possible, inform me before the missed work is due.

Academic Integrity and Authorized Collaboration

To learn the course materials and complete homework assignments, sharing ideas with fellow students will often be educational. Part of my teaching philosophy is to encourage students to learn from one another and to help fellow students to learn.

Collaboration on homework is authorized provided that it is done in the spirit of mutual learning and sharing of ideas. Collaboration strives to achieve balanced contributions from all members of a group; thus, when you collaborate, you should indicate the names of all persons with whom you collaborated. **The copying of someone else's work or ideas and representing them as your own is not collaboration and is unethical and prohibited.** As in most, if not all issues involving ethical considerations, it may be hard to know where to draw the line. If you do not provide the names of your collaborators, I will assume the collaboration is copying, not mutual learning. If you do collaborate, you are still responsible for understanding all the course material for quizzes and exams.

In the context of developing computer programs and solutions to homework, it is okay to discuss the problem statement and objectives, applicable theories and concepts, and desired results with your collaborators. Unless otherwise directed by your instructor, it is **NOT** acceptable to develop computer solutions or share spreadsheets and computer programs with other students.

Students are responsible for the knowing policies regarding academic honesty and the official HSU Student Code of Conduct. These documents can be found at the following links:

http://studentaffairs.humboldt.edu/judicial/conduct_code.php

http://studentaffairs.humboldt.edu/judicial/academic_honesty.php

Additional Student Services

If you have any type of disability that may hamper your full participation in course activities, it is your responsibility to inform me of your need for accommodations as soon as possible. I expect to hear from you within the first two weeks of the semester so that appropriate accommodations can be arranged. Complete information on the services available at HSU can be found at the Student Disability Resource Center (SDRC) in House 71, 826-4678 (voice) or 826-5392 (TDD) or on their website <http://www.humboldt.edu/~sdrc/>. Some accommodations may take up to several weeks to arrange.

If you qualify for extra time on exams or need other accommodations, it is your responsibility to obtain and provide me with the Exam Accommodation Request form from the SDRC. The form must be presented to me in a timely manner so appropriate arrangements can be made in advance for all exams. I strongly recommend submitting the form at the beginning of the semester or at least one week before the first exam that you wish to use accommodations. It is also strongly recommended that you communicate eligible accommodations and scheduling arrangements with me one week prior to exams. This will ensure your test accommodation arrangements are completed in a timely manner.

Other University Policies

Students are responsible for knowing the University policy and procedures for course registration and class room conduct. Two links are provided here and more information is available through the HSU web page. If you are concerned about a University policy and can not find the appropriate documentation, I will assist you.

Add/Drop policy: <http://www.humboldt.edu/~reg/regulations/schedadjust.html>

February 3 – Deadline to Add/DROP a course without a \$2.00 fee

February 16 – Last day to **DROP** courses **without** instructor's & department chair's signatures, and serious & compelling reason. After this date, a \$10 fee required and a "W" grade will be recorded.

April 17 – Last day to **DROP** a class with a serious & compelling reason (not eligible for fee refund); need instructor's & department chair's signatures

Attendance and disruptive behavior:

http://studentaffairs.humboldt.edu/judicial/attendance_behavior.php

Emergency Procedures

Please review the evacuation plan for FH 111 and JH 214 (posted on the yellow or orange sign next to the door).

You should also review campus emergency procedures at:

http://studentaffairs.humboldt.edu/emergencyops/campus_emergency_preparedness.php

During an emergency, information can be found campus conditions at: **826-INFO** or www.humboldt.edu/emergency

ENGR 333 Course Calendar – Spring 2009

The course calendar outlines the readings, quizzes, exams and activities for each week of the semester. It is subject to slight modifications as needed to adjust for the pace of the class. Any changes to the course calendar will be announced in class and via email. An updated calendar highlighting modifications will also be posted to the course Moodle site.

Week	Lecture Topics	Lab Topic	Reading
Jan 20 – 23	Course Introduction Fluid Properties	Fluid Properties Lab	Chap 1:1-9, 11
Jan 26 – 30	Fluid Properties cont'd	Velocity Visualization Lab 1	Chap 1
Feb 2 – 6	Fluid Statics	Quiz 1 Velocity Visualization Lab 2	Chap 2.1-5
Feb 9 – 13	Fluid Statics, cont'd	Quiz 2 Problem Session 1	Chap 2.6-8, 10
Feb 16 – 20	Control Volume Theory Conservation of Mass Conservation of Momentum	Quiz 3 Momentum Lab	Chap 3.1-4
Feb 23 – 27	Conservation of Momentum Conservation of Energy	Midterm Review Problem Session 2	Chap 3.5-6
Mar 2 – 6	Conservation of Energy	Midterm #1	Chap 3.6-7
Mar 9 – 13	Acceleration Differential Fluid Eqns	Energy Lab	Chap 4.1-2
Mar 16 – 20	***** SPRING BREAK *****		
Mar 23 – 27	Dimensional Analysis	Quiz 4 Dimensional Analysis Lab	Chap 5
Mar 30 – Apr 3	Pipe Flow	Prob Sess 3 – Optional Lab	Chap 6.1-4, 6-8
Apr 6 – 10	Pipe Flow	Quiz 5 Pipe Flow Lab Midterm Review	Chap 6.9-10, 12
Apr 13 – 17	Flow Past Immersed Bodies	Midterm #2	Chap 7.1, 6
Apr 20 – 24	Open Channel Flow	Open Channel Flow - Lab 1	Chap 10.1-4

Course Calendar, Cont'd

Week	Lecture Topics	Lab Topic	Reading
Apr 27 – May 1	Open Channel Flow	Quiz 6 Open Channel Flow Lab 2	Chap 10.5-6, Notes
May 4 – 8	Open Channel Flow	Course Review Problem Session 4	Chap 10
15 May 08	*****FINAL EXAM, Friday, May 15 from 8:00 – 9:50 AM *****		