

**CE 2375: Introduction to Fluid Mechanics
Fall 2023**

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| Class Reference Number: | 11413 |
| Class Meeting: | 12:00-1:20 pm, TR, Aug 28-Dec 7 |
| Class Room: | LART 318 |
| Textbook: | Fluid Mechanics, 3rd Edition by R.C. Hibbeler, ISBN: 013464929X <u>Pearson MasteringEngineering (comes with E-Text)</u> The purchase for access to this MasteringEngineering homework can also be made in combination with the textbook. (Available at UTEP Bookstore) |
| Instructor: | Mayra C. Chavez, Ph.D. Visiting Professor Department of Civil Engineering Office: E224 E-mail: mcchavez4@utep.edu Office Hours: 1:30 pm - 2:30 pm, TR |
| Prerequisite: | CE 2334: Statics |

Course Objectives

At the end of the course, students will learn the following:

1. Understand the concept of fluid systems and control volume
2. Understand the concepts of temperature, pressure, and energy;
3. Understand fluid flow descriptions and graphical descriptions
4. Apply conservation of mass and energy;
5. Apply the Bernoulli and energy equations;
6. Apply the linear momentum equation;
7. Understand steady laminar flow within parallel plates and smooth pipes
8. Understand resistance to flow in rough pipes and minor and major losses in single pipe flow

Chapters Covered

1. Fundamental Concepts in Fluid Mechanics
2. Fluid Statics
3. Kinematics of Fluid Motion
4. Conservation of Mass
5. Work and Energy of Moving Fluids
6. Fluid Momentum
7. (9) Viscous Flow within Enclosed Conduits
8. (10) Analysis and Design for Pipe Flow

Approved Calculators (Scientific Calculators)

- **Casio:** All **fx-115** models. Any Casio calculator must contain fx-115 in its model name.
- **Hewlett-Packard:** The **HP33s** and **HP 35s** models, but no others
- **Texas Instruments:** All **TI-30X** and **TI-36X** models. Any Texas Instruments calculator must contain either **TI-30X** or **TI-36X** in its model name.

Grades

Your grade for this course will be assessed based on your performance in the homework (15%), quizzes (15%), 3 mid-term exams (50%), and Final Exam (20%). Several quizzes will be given throughout the semester. The content of a quiz may be the materials covered in previous sessions or to be covered that day. There will be no make-up quizzes. Your worst quiz will be dropped. Three exams will be given during the semester, and one comprehensive Final at the end of the semester. Every student is required to take the exams. Every exam will be counted towards your final grade.

Your final grade will be calculated based on the points you have accumulated as follows:

| | |
|----------|-------------|
| A | ≥90 |
| B | ≥80 but <90 |
| C | ≥70 but <80 |
| D | ≥60 but <70 |
| F | <60 |

The instructor reserves the right to revise this grading plan. However, students will be informed of any changes during the semester.

Homework

Students are encouraged to solve as many problems in the book as possible. Students need to complete the assigned homework problems **online** before the due date. Late homework assignment submissions will receive a deduction of 5% per day after due date, but never lower than 60% credit.

Problem Solving Tips: Start a problem with one new sheet and write down all the givens and unknowns. Then proceed with calculation procedures before entering the answer online. Write down necessary details in the solution for easy checking of calculational errors or other possible mistakes. Use the hints provided in the MasteringEngineering website for the problems. Discuss the problems with your classmates, the teaching assistant, or the instructor. You will do well in the class if you understand all the problems you solved.

Go to: <https://mlm.pearson.com/enrollment/chavez88870>.

Detailed instructions included at the end of this document.

Course Portfolio

Students are strongly advised to prepare a course portfolio documenting all materials relevant to the course. The portfolio shall contain the class notes, quizzes, exams, homework, study notes, and any relevant materials accumulated during the semester. The instructor believes the students will benefit from the portfolio years later when they need to review the learned subjects for advanced courses or professional engineer licensure exam.

Attendance and Tardiness

Attendance is mandatory. Absence can be checked by the instructor through exams, roll calling, randomly picked names for problem solving in class, or other mechanisms. **You could receive an F grade if you miss more than 5 classes without the instructor's consent.** The instructor appreciates all efforts to attend the class. There will be no penalty for being late. You are always welcome to attend the class. However, all exams and quizzes will be given at *the beginning of the classes*. No additional time will be allowed for late attendees.

Study Aids

Instructor's Office Hours

You are always welcome to visit the instructors at the posted hours or by making an appointment.

Teaching Assistant

There will be a teaching assistant (TA) assigned to each session of the course. The TA will assist the instructor in grading quizzes, proctoring exams, and answering questions. In addition to the instructor's office hours, there will be TA's office hours to answer your questions. The TA's schedule will be announced in the second week of the class.

ACES and the Tutoring Center

Students are reminded of the tutoring services available in the ACES and the library. These services are provided to you by the University. Check the schedules and make use of the services.

Study Guide

Read the text to be discussed prior to the scheduled class and review the subject thoroughly after the class. Read the textbook carefully. Work on all examples given in the text and solve as many unassigned problems as you can. Expect to spend 8 to 10 hours each week on the subject. Establish a good studying habit and you will do very well in the class. Use the tutorial materials available in the MasteringEngineering before and after the class.

Policy on Cheating

Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts. (Regents: Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). Scholastic dishonesty harms the individual, all students, and the integrity of the university; policies on scholastic dishonesty will be strictly enforced. *Students having any mobile communication device out during exam or quiz will be considered to be engaged in academic dishonesty.*

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, 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.

References

Students are encouraged to study materials related to the subjects discussed in the class. There are many books that can help students to improve their understanding of the subjects and their problem solving skills. A vast amount of textbooks for similar topics are available at the UTEP library. For example, here are two good supplemental text books:

- Finnemore & Franzini, Fluid Mechanics with Engineering Applications, Tenth Edition, McGraw Hill

Class Schedule

| Week | Date | Ch. | Sections | HW Assigned | Class overview | Homework Due | |
|------|---------------------|--|--------------------|---|--|--------------|--|
| 1 | 8/29 8/31 | 1 1 | 1.1-1.10 | Chapter 1: 5, 11, 19, 30, 33 | Quiz 1 | | |
| 2 | 9/5 9/7 | 2 2 | 2.1-2.10 | Chapter 2: 4, 7, 11, 38, 39, 45, 46, 47, 53, 63 | Quiz 2 | HW 1 | |
| 3 | 9/12 9/14 | 3 3 | 3.1-3.5 | Chapter 3: 4, 17, 27, 30, 36, 46, 48, 51, 53 | Quiz 3 | HW 2 | |
| 4 | 9/19 9/21 | 4 | | | Exam 1 (Chap. 1, 2, 3) Exam 1 Review Solution | HW 3 | |
| 5 | 9/26 9/28 | 4 4 | 4.1-4.4 4.1-4.4 | Chapter 4: 2, 5, 12, 22, 27, 31, 39, 43, 51, 77 | Quiz 4 | | |
| 6 | 10/3 10/5 | 5 5 | 5.1-5.5 | Chapter 5: 1, 4, 22, 53, 75, 80, 95, 101 | | HW 4 | |
| 7 | 10/10 10/12 | 5 5 | 5.1-5.5 | | Quiz Chapter 5 | | |
| 8 | 10/17 10/19 | | | | Exam 2 (Chap. 4 and 5) Exam 2 Review Solution | HW 5 | |
| 9 | 10/24 10/26 | 6 6 | 6.1-6.4 | Chapter 6: 4, 7, 13, 29, 38, 45, 50, 57 | Quiz 6 | | |
| 10 | 10/31 11/2 | 6 9 | 6.1-6.4 | Chapter 9: 1, 7, 19, 25, 30, 36, 43 | Drop deadline | HW 6 | |
| 11 | 11/7 11/9 | 9 9 | 9.1-9.6 | | Quiz 9 | | |
| 12 | 11/14 11/16 | 10 10 | 10.1-10.3 | Chapter 10: 1, 5, 9, 13, 24, 27, 59, 65 | | HW 9 | |
| 13 | 11/21 11/23 | 10 | | | Quiz 10 Thanksgiving Break | | |
| 14 | 11/28 11/30 | 10 | | | Chapter 10 Exam 3 (Chap. 6, 9, 10) | HW 10 | |
| 15 | 12/5 12/7 | | | | Exam 3 Review Final Review | | |
| 16 | 12/11 - 12/15 | Finals Exam 4 (comprehensive Final) Tuesday Dec 12th @ 1pm-3:45pm | | | | | |

The above schedule, policies, and assignments in this course are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor and the students.

To register for Chavez2375Fall23:

1. Go to <https://mlm.pearson.com/enrollment/chavez88870>.
2. Sign in with your Pearson student account or create your account. For Instructors creating a Student account, do not use your instructor credentials.
3. Select any available access option, if asked.
 - Enter a prepaid access code that came with your textbook or from the bookstore.
 - Buy instant access using a credit card or PayPal.
 - Or Select Get temporary access without payment for 14 days.
4. Select Go to my course.
5. Select Chavez2375Fall23 from My Courses.

If you contact Pearson Support, give them the course ID: chavez88870

To sign in later:

1. Go to <https://mlm.pearson.com>.
2. Sign in with the same Pearson account you used before.
3. Select Chavez2375Fall23 from My Courses.