

**PURDUE UNIVERSITY**  
School of Mechanical Engineering  
ME 30900 — **Fluid Mechanics** — Fall 2013

**Course Web Page**

Assignments, class information, and scores will be posted on Blackboard: <https://mycourses.purdue.edu>. Information presented in lecture or the lab preparation session supersedes the information posted on Blackboard. Students are responsible for any information given in lecture or the lab preparation session.

**Textbook**

Pritchard, P.J., *Fox and McDonald's Introduction to Fluid Mechanics*, 8th ed., Wiley & Sons.

**Additional Helpful References**

Munson, B.R., Young, D.F., and Okiishi, T.H., *Fundamentals of Fluid Mechanics*, Wiley & Sons.

Sabersky, R.H., Acosta, A.J., and Hauptmann, E.G., *Fluid Flow: A First Course in Fluid Mechanics*, Macmillan.

Wassgren, C., *Notes on Fluid Mechanics and Gas Dynamics*, <https://engineering.purdue.edu/~wassgren/notes>

White, F.M., *Fluid Mechanics*, McGraw-Hill.

There are many other undergraduate fluid mechanics texts available in the Engineering Library. Students are encouraged to use these as references.

Undergraduate calculus and thermodynamics texts.

**Course Objectives**

1. Develop the ability to identify and classify the various types of flows one may encounter.
2. Develop (from first principles) the control volume formulation of the basic laws with emphasis on conservation of mass and Newton's 2<sup>nd</sup> law.
3. Apply the control volume formulation of the basic laws to model physical systems.
4. Conduct simple experiments and analyze data.
5. Enhance systematic problem solving skills and sharpen written communication skills through short technical laboratory reports.

**Course Prerequisites**

ME 30900 must be preceded by differential equations, dynamics, and a first course in thermodynamics.

**Computer Usage**

Knowledge of word processing and spreadsheet software will be necessary for laboratory report preparation and some homework assignments. Knowledge of a computer programming language may also be helpful for some assignments.

**Attendance and Honesty Policy**

Students are responsible for all material covered during class, including assignments and quizzes. If the instructor is late, students should wait 15 minutes before leaving. In the event of a major campus emergency, course requirements, deadlines, and grading schemes are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Campus emergency information can be found on Purdue's home page <http://www.purdue.edu>. Students can also sign up for emergency text messages at <http://www.purdue.edu/securepurdue>.

Students are encouraged to avoid coming to class if they are ill so that they can recover more quickly and avoid infecting their colleagues. The instructor will work with the student to determine the best approach for getting the student caught up on the course material when they return. Students must pre-arrange absences for graded assignments and exams, or submit a documented excuse (e.g., a signed note from a doctor) if such arrangements cannot be made.

The Purdue University Code of Honor is in effect for all students:

[http://www.purdue.edu/studentregulations/student\\_conduct/codeofhonor.html](http://www.purdue.edu/studentregulations/student_conduct/codeofhonor.html)

Students are not allowed to collaborate, talk with one another, or use unauthorized materials on exams.

Violation of this policy will result in a failing grade (i.e., a grade of an "F") for the course and be reported to the Office of the Dean of Students.

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### Grading Policy

Final grades will be determined using the following algorithm.

1. All final scores will be normalized (i.e., divided) by, at most, the largest student final score in the class and multiplied by 100. The value of the normalization score may be smaller than the largest student final score, based on the instructor's discretion and the overall course performance. For example, if the largest final score in the class is a 95, all other scores will be divided by a value  $\leq 95$ .
2. The final grades will be determined using the following table.

$97 \leq \text{score}$	$\Rightarrow A+$	$93 \leq \text{score} < 97$	$\Rightarrow A$	$90 \leq \text{score} < 93$	$\Rightarrow A-$
$87 \leq \text{score} < 90$	$\Rightarrow B+$	$83 \leq \text{score} < 87$	$\Rightarrow B$	$80 \leq \text{score} < 83$	$\Rightarrow B-$
$77 \leq \text{score} < 80$	$\Rightarrow C+$	$73 \leq \text{score} < 77$	$\Rightarrow C$	$70 \leq \text{score} < 73$	$\Rightarrow C-$
$67 \leq \text{score} < 70$	$\Rightarrow D+$	$63 \leq \text{score} < 67$	$\Rightarrow D$	$60 \leq \text{score} < 63$	$\Rightarrow D-$
$\text{score} < 60$	$\Rightarrow F$				

#### 5% Homework

- a) Homework assignments may be completed in teams of up to, but no more than three students. All team members must be in the same lecture section and each team member is expected to contribute to each assignment. Team members may change from assignment to assignment, but teams should not split during the course of a single assignment. Each team member's name must appear on each page of the assignment, and all team members will receive the same assignment score.
- b) Homework must be turned in within the first five minutes of your lecture period on the due date. Homework will not be accepted at the end of the lecture period or in another lecture period. Late homework will not be accepted without an authorized excuse.
- c) A subset of the assigned homework problems will be graded. You may wish to retain a copy of your homework solution to compare with the posted solution prior to your work being returned to you.
- d) Graded homework can be picked up from Ms. Elaina Leshner in ME 2172. Graded homework not collected after one week from when the assignment was made available for return will be discarded.
- e) Homework solutions will be posted on Blackboard.

#### 10% Laboratory

- a) Refer to the *Laboratory Policy and Procedures* handout for details concerning the laboratories.

#### 5% Laboratory Preparation Quizzes

Short quizzes will be given during many of the lab preparation periods and will be based on material covered in previous weeks.

20% Exam 1: Th, 26 Sep; 8:00-10:00 P.M.; CL50 and MATH 175

20% Exam 2: We, 30 Oct; 8:00-10:00 P.M.; CL50 and MATH 175

20% Exam 3: We, 20 Nov; 8:00-10:00 P.M.; LILY 1105 and SMTH 108

20% Final: TBD

- a) All exams will be closed notes and closed book unless otherwise indicated. Formula sheets will be provided with the exams. No materials other than the formula sheets are to be used during exams.
  - b) The only calculating device students are allowed to use on exams is a TI-30XA calculator unless otherwise indicated.
1. A score of zero will be recorded for missed assignments, quizzes, or exams without a documented, authorized excuse. An oral make-up assignment, quiz, or exam may be given in place of a written one.
  2. Homework, laboratory, quiz, and exam re-grades must be submitted within one week of the date the graded document has been made available for return. Re-grades submitted after this deadline will not be considered. Re-grade requests must include a written statement detailing the justification for the re-grade. Note that documents are re-graded from scratch and may result in a score lower than the original score.
  3. All assignments submitted for grading, including homework, quizzes, laboratory reports, and exams, must be presented in a straightforward and neat manner. Be sure to include all pertinent information such as coordinate axes, free body diagrams, control volumes, and units. Answers should be clearly indicated. Multiple page assignments must be stapled together. Loose, folded, or paper-clipped papers will not be accepted. Points will be deducted for convoluted or sloppy work. Each homework problem must contain the following header printed in the upper, right corner of each page:  
Last name, First name (of each team member)  
Hwk Assignment \*  
Lecture Section \*  
If this format is not followed, a grade of zero will be assigned.
  4. For privacy, scores will not be reported via e-mail or telephone. Scores will be posted using Blackboard.