

TEXAS A&M UNIVERSITY
Department of Mechanical Engineering

MEEN 344 Fluid Mechanics
Section 502, Spring 2013

Instructor: Dr. Eric L. Petersen
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Office hours: T 10:00-12:00; TH 14:00-16:00 or by appointment

Description: Application of laws of statics, buoyancy, stability, energy, and momentum to the behavior of ideal and real fluids; dimensional analysis and similitude and their application to flow through ducts and piping; dynamic lift and related problems; internal and external viscous flow.

Units: 3

Prerequisites: MEEN 221 – Statics and Particle Dynamics
MEEN 315 – Principles of Thermodynamics

Lecture Times: T, TH 08:00-09:15 **Room:** ZACH 104B

Website: Vista WebCT

Required Text: *Fox and McDonald's Introduction to Fluid Mechanics*, 8th Edition
by Phillip J. Pritchard
John Wiley & Sons, 2011 ISBN-13 9780470547557

Grading: Exams 1, 2, 3 65% total
Homework 5%
Final Exam 30%

The grade is based on three mid-term exams, one comprehensive final exam, and assigned homework. The grading will be relative but, in general, the minimum scale will be based on A = 90-100%, B = 80-89.9%, C = 70-79.9%, etc. In other words, if you have an 82 average but the class average is 85, you will still get a B.

Homework:

Working homework problems is a necessity for learning and practicing the material. The student is responsible for keeping up with the homework assignments and their due dates; the assignments will be collected in class on the due date. The solutions will be given some time prior to the exam that uses the material on which the problems are based. Problem-solving techniques and comprehension of the materials are emphasized over memorizing particular types

or styles of problems. Searching the textbook for the proper equation to plug your numbers into rather than following a proper solution technique is highly discouraged.

Attendance:

Attendance during the lecture period is strongly encouraged for complete understanding of the material, but it is not a required component of your grade. Class notes, however, are in general not posted. Also, missing a scheduled exam for a job interview is not an excused absence.

Academic Honesty:

Ethical behavior and academic honesty are expected and required of students and even more so of engineers and scientists. Evidence of cheating during an exam or quiz may result in failure of the entire course for the student(s) in question. The same goes for homework that is not your own work. Examples of cheating include, but are not limited to, looking at someone else's work for answers or hints during an exam; copying the work of someone else on graded homework; using available homework solutions from an electronic or hardcopy source to help complete your graded homework; secretly passing exam answers between students in a large (or otherwise) classroom; use of electronic communication devices during an exam; any speaking during an exam, in any language; consulting your textbook or class notes during a closed-book exam; sharing calculators during an exam.

Aggie Honor Code: "An Aggie does not lie, cheat, or steal, or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/

On all course work, assignments, and examinations at Texas A&M University, the following Honor Pledge shall be preprinted and signed by the student:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Americans with Disabilities Act (ADA) Policy Statement:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118 or call 845-1637. For additional information visit <http://disability.tamu.edu>

Course Outline

The course will follow the required textbook quite closely in terms of sequence and basic content, and homework problems will be taken from it. However, differences between the text and the lecture notes may occur in an attempt to make the subject clear to the student, at the discretion of the instructor. Also, at times the problem-solving approach presented during the lecture may differ somewhat from that presented in the text, also to the benefit of the student (but the end result will be the same). ***It is to the student's advantage to come to class since the material for which the students are responsible is taken from the content of the lecture notes and not from the textbook.*** Table 1 presents the overall course schedule, showing exam dates,

which are subject to change by the instructor after giving at least one week notice as to the date change.

The following topics will be covered. The suggested sections for reading and content will be provided on Vista for each chapter as we progress through the course.

- Chapter 1 – Introduction
- Chapter 2 – Fundamental Concepts
- Chapter 3 – Fluid Statics
- Chapter 4 – Basic Equations in Integral Form for a Control Volume
- Chapter 5 – Introduction to Differential Analysis of Fluid Motion
- Chapter 6 – Incompressible Inviscid Flow
- Chapter 7 – Dimensional Analysis and Similitude
- Chapter 8 – Internal Incompressible Viscous Flow
- Chapter 9 – External Incompressible Viscous Flow

Table 1 Schedule for MEEN 344-502, Spring 2013

Week	T	Th	Notes
1	1/15	1/17	
2	1/22	1/24	
3	1/29	1/31	
4	2/5	2/7	Exam 1: 2/7
5	2/12	2/14	
6	2/19	2/21	
7	2/26	2/28	
8	3/5	3/7	Exam 2: 3/5
9	-	-	Spring Break - No Classes
10	3/19	3/21	
11	3/26	3/28	
12	4/2	4/4	
13	4/9	4/11	Exam 3: 4/11
14	4/16	4/18	
15	4/23	4/25	
16	*	-	*Redefined Friday - no class
17	-	-	Final Exam: 5/6, 13-15:00