

ENSC 283
INTRODUCTION TO FLUID MECHANICS
Spring 2011

Instructor:	Dr. Majid Bahrami	4372	Email: mbahrami@sfu.ca
T.A.s	Mohsen Akbari	4300	Email: maa59@sfu.ca
	Setareh Shahsavari	4220	Email: sshahsav@sfu.ca
	Mehran Ahmadi	4300	Email: mahmadi@sfu.ca

Course objective:

This is an introductory course in fluid mechanics. The approach to the subject emphasizes the physical concepts of fluid mechanics and methods of analysis that begin from basic principles.

Textbook:

Fluid Mechanics, 7th Edition
Frank White, McGraw-Hill, 2011.

Supplementary Books:

- 1) *Fundamentals of Fluid Mechanics*, 5th Edition
Bruce Munson, Donald F. Young, and Theodore H. Okiishi, John Wiley, 2006.
- 2) *Fundamentals of Fluid Mechanics*, 7th Edition
Robert W. Fox, Philip J. Pritchard, and Alan T. McDonald, John Wiley, 2009.

Office Hours:

Open door.

Course Schedule:

Lectures: Wed 1:30 – 2:20 and Fri 12:30 – 2:20; Room SUR 3090
Tutorial: Wed 12:30 – 1:20; Room SUR 3090
Lab: Mon 12:30 – 3:20, Wed 2:30 – 5:20, Fri 8:30 – 11:20, Lab 4302

Course Outline:

Properties of fluids. Basic flow analysis techniques. Basic concepts: velocity field, stress, flow patterns, classification of fluid motion. Fluid statics: pressure distributions, hydrostatic forces on submerged surfaces, buoyancy and stability. Integral analysis of fluid motion: conservation of mass, momentum balance, energy balance. Dimensional analysis and similarity. Flow in pipes and pipe systems. Flow measurement.

Course Webpage:

<http://www.sfu.ca/~mbahrami/ENSC 283.htm>

Tutorials:

Selected problems will be solved and questions about lecture material or assignments will be answered in tutorials. Individual help will be given.

Laboratory:

There are five laboratory exercises for this course. Lab information is posted on the website. Laboratory report requirements, background and a lab schedule will be made available in the second week of term. During the lab period, students will work in groups as assigned.

Experiment 1: Properties of Fluids

Experiment 2: Hydrostatic Pressure

Experiment 3: Basics of Fluid Mechanics, Friction in Laminar and Turbulent Pipe Flow

Experiment 4: Bernoulli Equation

Experiment 5: Variable Speed Centrifugal Pump

Assessment:

Project	5%
Lab Reports	15%
Midterm	35%
Final	45%

Note: to pass the course, you should pass the final exam.

The midterm and final are closed book examinations of the course material. However, you are permitted to use a photocopy of unit conversion tables from the textbook plus a crib sheet consisting of one side of one 8 1/2× 11 sheet of paper. The preparation of a well-structured crib sheet will help during the testing of ENSC 283 but it will also help in the preparation for exams as you assign priority to what is and is not important.

Each week an assignment of 1 or 2 problems along with several suggested problems will be posted online. It is highly recommended that you work out the suggested problems and the assignments.

There will be at least two pop quizzes during the semester, with bonus marks. The pop quizzes will be selected from the assignments and the suggested problems posted on the course webpage.

The final numerical score will be transferred to a letter grade following the Letter Grading Scheme described in the University Calendar.