

**University of Hawaii at Manoa
Department of Mechanical Engineering**

ME 322 Mechanics of Fluids (Spring 2012)

Instructor

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Office Hours: Tuesday 3:00-5:00 pm or by appointment

TA: TBA

Prerequisites

- Grade C or better in ME 311
- Grade C or better in CEE 271

Course description

This course introduces the fundamental physical and theoretical description of phenomena related to the flow of fluids.

Course objectives

By the end of this course, the students are expected to:

- understand and use fluid mechanics terminology
- understand and use the concepts and equations of fluid statics
- understand the proper applications of the Bernoulli equation
- use thermodynamic control volume concepts in fluid dynamics for applications that include momentum, mass and energy balances, and the Reynolds transport theorem
- understand the use of the inviscid form of the differential equations of fluid dynamics
- have a basic understanding of internal and external viscous flows

Textbook

Bruce R. Munson, Donald F. Young, Theodore H. Okiishi, Wade W. Huebsch, *Fundamentals of Fluid Mechanics*, **6th ed.**, Wiley, 2009.

Earlier editions or e-version of the textbook is also acceptable.

ME 322 Course Syllabus (Spring 2012)

Topics

- Introduction and basic concepts Ch. 1
- Fluid statics Ch. 2
- Bernoulli equation Ch. 3
- Fluid kinematics Ch. 4
- Finite control volume analysis Ch. 5
- Differential analysis of fluid flow Ch. 6
- Dimensional analysis, similitude, and modeling Ch. 7
- Viscous flow in pipes Ch. 8
- Flow over immersed bodies Ch. 9

Course schedules

TR 10:30-11:45 am at MSB 100

Course website

PDF files of lectures, solutions of homework, handouts will be posted on *Laulima*.

Exams and Grading

- Homework 20%
- Two in-class exams
 - Chs. 1-4 20%
 - Chs. 5-7 20%
- Final exam (Chs. 1-9) 40%

All the exams will be closed textbook and closed notes. However, one letter-sized cheat sheet will be allowed for the final exam. The final grade will be curved.

Homework

Weekly homework will be assigned on every Thursday and collected on the following Thursday.