

Course: CEE 331

FLUID MECHANICS

GENERAL INFORMATION

1st semester

Credits: 4CU-6UC

Lectures: M 12:00-14:00; W 12:00-13:00

INSTRUCTOR(S)

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COURSE OBJECTIVE

Covers hydrostatics, the basic equations of incompressible fluid flow, potential flow and dynamic pressure forces, viscous flow and shear forces, steady pipe flow, turbulence, dimensional analysis, laminar and turbulence boundary layer, flows around obstacles, and open-channel flow. Includes small-group laboratory assignments.

TEXTBOOK

A Brief Introduction to Fluid Mechanics, 3rd Edition

Donald F. Young, Bruce R. Munson, Theodore H. Okiishi

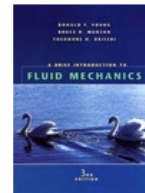
ISBN: 0-471-45757-4

Publisher: John Wiley & Sons

Hardback

560 Pages

Published August 2003



GRADING

Homework: 20%
Lab Experiments: 10%
Prelim 1: 20 %
Prelim 2: 20%
Final Exam: 30%

COURSE SYLLABUS

Laboratory	Date	Lecture	Reading	Assignment Due Dates
		Introduction, Fluid Properties		

		Fluid Properties		
		Fluid Statics	2.1 - 2.4	
Lab#1 - Pressure & Surface Tension		Barometers/Manometers	2.4 - 2.8	Problem Set 1
		Force on plane surfaces	2.9 - 2.12	
		Force on plane surfaces		
		Force on curved surfaces / Buoyancy		Problem Set 2
		Fluid Kinematics	4.1-4.2	
		Fluid Kinematics	4.3-4.4	
		Control Volume Analysis	5.1	Problem Set 3
		Control Volume Analysis	5.2	
		Control Volume Analysis		
		Moment of Momentum Examples		Problem Set 4
		Summary and Review for Prelim 1		Sample Prelim 1 Solutions
		Prelim 1		
		Energy Equation	5.3	
		Bernoulli Equation	3.1-3.5	
		Energy/Bernoulli Equation	3.6-3.8	
		Energy/Bernoulli Equation		Problem Set 5
Lab#2 - Conservation Equations and the Hydraulic Jump				
		Differential Analysis - Conservation of Mass	6.1 - 6.2.2	
		Differential Analysis - Conservation of Momentum	6.3-6.4.4	
		Euler's Equations	6.8 - 6.10	Problem Set 6
		Navier-Stokes Equations		
		Dimensional Analysis		
Lab#3 - Similitude: The Karman Vortex Street		Dimensional Analysis/similitude	7.1 - 7.7	Problem Set 7
		Similitude/Experimental Analysis	7.8 - 7.9	Sample Prelim 2 Solutions
		Internal Flows	8.1 - 8.2	Mid-semester Survey
		Summary and Review for Prelim 2		Problem Set 8
				Prelim 2

		Turbulent Pipe Flow	8.5 - 8.6		
Lab#4 - Pipe Flow, Minor and Major Losses		Minor Losses		Problem Set 9	
		Outer Flows	9.1-9.2		
		Boundary Layers	9.3-9.4		
		Boundary Layers, Lift & Drag		Problem Set 10	
		Drag			
		Open Channel Flow	10.1-10.3		
		Open Channel Flow	10.4-10.6	Problem Set 11	
		Open Channel Flow			
		Open Channel Flow			
		Open Channel Flow			
		Review for Final		Problem Set 12 Sample Final (not due) Sample Final Soln	
		Final			