

CEE 330-Hydromechanics

Course Syllabus-Spring 2018

Instructor: Dr. Navid Tahvildari
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Grader: TBD
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Lectures: TR 1:30 – 2:45 pm Room: Constant Hall 1037

Instructor Office Hours: M 3:00 - 5:00 pm, or by appointment

Grader Office Hours: TBD

Course Description:

This course studies the fundamentals of fluid behavior at rest or in motion. Studying fluid statics and dynamics enables solving engineering problems such as flow rate through pipes, hydrostatic loads on structures, or drag forces on floating or submerged objects. The focus is particularly on liquids.

Learning Objectives:

- Define fluid properties
- Calculate hydrostatic forces
- Apply the Bernoulli equation
- Comprehend fluid kinematics
- Explain conservation laws for mass, momentum, and energy
- Conduct dimensional analysis
- Explain viscous flow in pipes, and laminar vs. turbulent flow
- Calculate forces on immersed bodies
- Formulate steady flow in open channels

Textbook

Fluid Mechanics with Engineering Applications (Tenth Edition) by E. John Finnemore and Joseph B. Franzini, McGraw Hill, 2002.

Course Communications:

Course materials will be available on Blackboard: www.blackboard.odu.edu

Allow up to 48 hours for response to emails.

Prerequisite: Dynamics (MAE 205), Calculus II (Math 212)

Grading Policy:

Homework and attendance 5%, Quizzes 20%, First Exam 22.5%, Second Exam 22.5%, Final Exam 30%

Homework:

Homework will be assigned upon completion of each chapter and will be due one week after assignment at the beginning of the class. Group work is accepted but blind copying is not allowed. Late homework will not be accepted. Students should have a valid university excuse to request exception. The Homework will be graded by a grader and not all homework problems may be graded.

Quizzes:

Quizzes are assigned on the homework due dates. They include a single problem from the homework assignments due on that date. Quizzes will be graded by the grader. No books, notes, or other resources can be used during the quiz.

Exams:

Two mid-term exams and a final exam are scheduled. Each student may prepare notes on the front and back of a letter size paper for his or her own use. This sheet can only include formulas (not problems or examples) and will be turned in with your exam. No resources other than the formula sheet can be used. Exam #1 will cover chapters 1-4 and exam #2 will cover chapters 5-8. The final exam will be cumulative.

Absence:

Student attendance in the lectures is strongly encouraged. Presence in all the quizzes and exams are required. Students should have a valid university excuse for absence from the exams or quizzes or missing assignments. It is the student's responsibility to notify the instructor in advance and make appropriate arrangements.

Course Schedule:

Note: This schedule is tentative and may be changed due to travel or other incidents. The class will be notified in advance of possible changes.

Week	Lecture	Date	Topic	Reading
1	1	Jan. 9	Introduction; basic concepts; dimensions and units	1
	2	Jan. 11	Properties of fluids	2.1-2.7
2	3	Jan. 16	Properties of fluids (HW#1)	2.9-2.13
	4	Jan. 18	Fluid statics	3.1-3.2
3	5	Jan. 23	Fluid statics	3.3-3.5
	6	Jan. 25	Fluid statics	3.6
4	7	Jan. 30	Fluid statics (HW#2)	3.7-3.10
	8	Feb. 1	Basics of fluid flow	4.1-4.4
5		Feb. 6	Instructor Travelling – No Class	
		Feb. 8	Basics of fluid flow (HW#3) – Midterm 1 review	4.5-4.8
6	9	Feb. 13	Mid-term Exam 1	
	10	Feb. 15	Energy in steady flow	5.1-5.2
7	11	Feb. 20	Energy in steady flow 5.3-5.4	5.3-5.4
	12	Feb. 22	Energy in steady flow	5.5-5.10
8	13	Feb. 27	Energy in steady flow (HW#4)	5.11-5.18

	14	Mar. 1	Momentum and forces in fluid flow	6.1-6.5
9		Mar. 6, 8	Spring Break-No Class	
10	15	Mar. 13	Similitude and dimensional analysis	7.1-7.4
	16	Mar. 15	Similitude and dimensional analysis (HW#5)	7.5-7.7
11	17	Mar. 20	Steady incompressible flow in pressure conduits	8.1-8.6
	18	Mar. 22	Steady incompressible flow in pressure conduits	8.7-8.13
12	19	Mar. 27	Steady incompressible flow in pressure conduits (HW#6) - Midterm 2 review	8.14-8.18
	20	Mar. 29	Mid-term Exam 2	
13	21	Apr. 3	Forces on immersed bodies	9.1-9.6
		Apr. 5	Forces on immersed bodies (HW#7)	9.6-9.15
14	22	Apr. 10	Steady flow in open channels	10.1-10.4
	23	Apr. 12	Steady flow in open channels	10.5-10.15
15	24	Apr. 17	Steady flow in open channels (HW#8)	10.15-10.24
	25	Apr. 19	Final Exam Review	
16		Apr. 24	Reading Day-No Class	
		May 5	Final Exam (8:30-11:30 am)	

Americans with Disabilities Act (ADA) Policy Statement

Old Dominion University is committed to ensuring equal access to all qualified students with disabilities in accordance with the Americans with Disabilities Act. The Office of Educational Accessibility (OEA) is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations. If you experience a disability which will impact your ability to access any aspect of my class, please present me with an accommodation letter from OEA so that we can work together to ensure that appropriate accommodations are available to you. If you feel that you will experience barriers to your ability to learn and/or testing in my class but do not have an accommodation letter, please consider scheduling an appointment with OEA to determine if academic accommodations are necessary. The Office of Educational Accessibility is located at 1021 Student Success Center and their phone number is (757)683-4655. Additional information is available at the OEA website: <http://www.odu.edu/educationalaccessibility>