Identification	**Subject**	ENGR210, Fluid Mechanics 1, 6 ECTS	
	Department	Chemical Engineering	
	Program	Undergraduate	
	Term	Fall, 2025	
	Instructor	Kanan Mammadov	
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Prerequisites	Algebra, Basic Calculus, Mechanics		
Language	English		
Compulsory/Elective	Required		
Required textbooks and course materials	***Textbook:*** *Fluid Mechanics, Fundamentals and Applications, Yunus A. Çengel, John M. Cimbala*		
Course website	n/a		
Course outline	This course aims to introduce the topic of fluid mechanics covering fundamental theory of fluid flow, fluid statics and its use in selecting equipment suitable for fluid conveying.		
Course objectives	• Understanding basic laws, principles and phenomena in the area of fluid mechanics • To solve simplified examples of fluid mechanics • Theoretical and practical preparation enabling students to apply the acquired knowledge and skills in professional and specialist courses.		
Learning outcomes	• Demonstrate a thorough understanding of fluid statics and fluid dynamics, with particular application to chemical and process industries. • Relate pressure drop and flowrate in pipe flows; be able to calculate flow rates in channel flows. • Demonstrate an understanding of the principles and limitations of current flow metering systems. • Demonstrate an understanding of the different choices available in pump selection for process applications and be able to specify in detail a centrifugal pump for a given duty. • Apply mathematical analysis to fundamental fluid flow problems. • Demonstrate competence in the practical application of fluid flow theory. • Demonstrate an industrial awareness of equipment to convey and measure the flow of liquids and gases. • Demonstrate experience in working with fluid conveying and measuring equipment.		
Teaching methods	**Lecture**		x
	Group assignment		x
	Simulation		x
	Case analysis		x
	Others		
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Class Participation		15

	Project		15
	Final Exam		40
	Others		
	Total		100
Policy	• Quizzes will be provided during the classes, and they are to be based on the topic covered during the classes. Random quizzes during semester are for the instructor to decide the eligibility of student for the semester project. • Group based practical project is going to be given in order to illustrate the practical significance of the theory taught in the classes. The project represents a collective endeavor undertaken by students within the realm of scientific inquiry. The incorporation of this project into the curriculum serves the dual purpose of showcasing the subject's research endeavors to potential students and illuminating the ongoing scholarly activities within the field. • Midterm will be carried out in the week announced by the university. Time allocated will be announced close to the midterm. Its primary objective is to provide students with a clearer assessment of their progress within the course, enabling them to gauge their performance and understanding up to that point. • Final exam date and time will be defined by the University. A final examination is an evaluative assessment presented to students at the conclusion of an academic term or course of study. This assessment typically consists of a predefined set of questions or exercises designed to gauge students' proficiency and comprehension of the subject matter. • NO CELL PHONES are allowed during lecture. PLEASE turn them off before lecture! (Not silent or vibrating mode). This is a university policy and accepted by the department of PE, and violators will be reprimanded accordingly. • **Participation and interaction in classes are more important than just attendance.** • No late tasks/homework will be accepted. Homework is to be completed on an individual basis. Students may discuss homework with classmates, but students are responsible for their own work. If students have consulted classmates, please note the individuals name on the top of students' assignment. • No late assignments will be accepted without prior arrangement with the instructor for acceptable excuses. Medical and family emergency will be considered on case-by-case basis. Note that inability to participate in quiz or presentations will not be accepted, and YOU WILL NOT HAVE A SECOND CHANCE TO PRESENT YOUR RESULTS OR PARTICIPATE IN QUIZZES. IN CASE OF ABSENCE, YOU WILL HAVE TO PRESENT "ARAYIŞ" TO THE INSTRUCTOR. • Quizzes may be given unannounced throughout the term. • There will be no make-up quizzes. • No make-up exams. If students miss an exam, a zero score will be assigned to the missed exam.		

	• If students should miss class due to personal emergency or medical reasons, please notify the instructor by email immediately. A doctor's note will be required for make-up work. • Students are responsible for completing the reading assigned from the textbook related to the covered topics and for checking email regularly for important information and announcements related to the course. • Any form of plagiarism or cheating on a proposal, work plan, bibliography, presentation of literature review, final report will result in the cancellation of the work. In this case, the student will receive a mark of 0 without any further consideration. After identification cheating or plagiarism, NO CHANCE will be given for correction and rewrite report. • University policy on academic honesty concerning exams and individual work will be strictly enforced.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Introduction and Basic Concepts	Ch1
2		Properties of Fluids	Ch2
3		Pressure and Fluid Statics	Ch3
4		Introduction to Fluid Dynamics, Conservation Laws	Ch5
5		Bernoulli Equation	Ch5
6		**Mid-term Exam**	
7		Laminar Flow in a Pipe, Velocity Profile and Shear Stress Variation, Volumetric Flow Rate Determination, Pressure Loss Calculation	Ch8
8		Turbulent Flow in a Pipe, Velocity Profile and Shear Stress Variation, Volumetric Flow Rate Determination, Pressure Loss Calculation	Ch8
9		Differential Analysis of Fluid Flow	Ch9
10		Approximate Solutions of the Navier-Stokes Equation	Ch10
11		Multiphase Flow, Two Phase Gas-Liquid Flow, Two Phase Liquid-Liquid Flow, Two Phase Liquid-Solid Flow	**MPF-1 file** to be shared with students
12		Turbomachinery	Ch14

13		**Project**	
14		**Course Overview** **Mock Exam**	
15		**Project Presentations**	
	TBC	**Final Exam**	

This syllabus is a guide for the course and any modifications to it will be announced in advance.