Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Mechanical Engineering Department

SYLLABUS

Code/Name	MCE 204 / Fluid Mechanics I
Type	Required
Credit/ECTS	3/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/2
Semester	Spring
Classroom	A203
Content	Classification of fluid flows. Properties of fluids. Pressure, fluid statics, forces on plane and curved surfaces, and buoyancy. Kinematics of fluid motion. Bernoulli and energy equations. Momentum analysis of flow systems. Dimensional analysis and modeling. Internal flow, head losses, and minor losses in pipes.
Prerequisites	
Textbooks	***Primary*** Y Çengel, J Cimbala, *Fluid Mechanics: Fundamentals and Applications*, 4th edition, McGraw-Hill Education, 2018. ***Supplementary*** FM White, *Fluid mechanics*, 8th edition, McGraw-Hill Education, 2015.
Objectives	• *To teach basic principles of fluid mechanics* • To teach and apply physical and mathematical methods used in analyzing • engineering applications involving fluids • To introduce importance of fluid mechanics in engineering applications
Course Outcomes	In this course you will be able to: C01 Adequate knowledge on properties of fluids, pressure distribution in hydrostatic systems, integral and differential forms of momentum balance and laminar and turbulent flows C02 Ability to identify, formulate, and solve complex engineering problems involving laminar and turbulent flows; ability to select and apply proper analysis and modeling methods for this purpose. CO3 Students will be able to derive and use the equation of fluid statics CO4 Students will be able to use integral equations for flow analysis CO5 Students will be able to analyze the flows in pipe systems.

Weekly Schedule of Topics

W	Topic
1	Intoduction to basic concepts
2	Properties of fluids
3	Pressure, Intoduction to Fluid Statics and its application
4	Flow kinematics: Langrangian and Eulerian Descriptions
5	Flow kinematic: Vorticity, Rotationality, Reynold Transport Theorem
6	Conservation of mass, Conservation of Energy, Mechanical Energy Efficiency
7	Bernoulli Equation, General Energy Equation
8	Applications of Bernoulli and Energy Equations
9	Momentun analysis of flow systems: Newton'S Laws, Controle Volume, Momentum Equation
10	Applications of Momentun analysis of flow systems
11	Dimensional analysis and modeling, Buckingham Pi Theorem

12	Internal flows: Flows in pipes, laminer and turbulent flows
13	Internal flows: Piping Systems, Series and Paralel Pipes
14	Applications of internal flows

Professional Contribution	Utilize both theoretical and practical knowledge in engineering solutions

Contribution to Program Outcomes[*]

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	4	4	5	0	3	1	0	0	3	0
CO2	5	5	4	4	0	3	1	0	0	3	0
CO3	2	5	1	3	1	2	2	1	0	2	1
CO4	1	2	3	4	2	1	3	2	4	1	2
CO5	5	4	1	2	5	3	5	2	4	2	3

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	The consequence of violation of the attendance rule is to receive a grade of **NA.**
Requirements	NA
Evaluation	Midterm Exam 40% Quiz, Assignment 10% Final Exam 50% Total 100%
Rubric	NA
Course Policy	1. You must attend at least 70% of the sessions including add-drop period. 2. Be in the class on time. 3. English should always be used to communicate with one another. 4. Mobile phone should be switched off and put away during the class. 5. You cannot talk to your friends during class no matter what the subject is.
Cheating & Plagiarism	• Copying or letting someone to copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **F** for the course.

Instructor

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Room	216	Office Hours	

Prepared by Gökhan Canbolat