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

SYLLABUS

Code/Name	MCE 312.2/Pipeline Engineering
Type	Technical Elective
Credit/ECTS	3/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/3
Semester	Spring
Classroom	D204
Content	Fundamentals of piping systems. Hydraulic and mechanical design considerations. Pipe sizing and selection, and wall thickness. Pipe network design and analysis. Pipeline economics. Transient pipe flow. Pump performance and analysis, and affinity laws. Cavitation and net positive suction head. Natural gas transmission
Prerequisites	
Textbooks	***Primary:*** Design of Fluid Thermal Systems, W. S. Janna, 4th edition, SI Edition, 2015, Cengage Learning Supplementary
Objectives	1. Understand hydraulic and mechanical design procedures for pipelines. 2. Use computational techniques to solve flow in simple pipe networks. 3. Learn the fundamentals of transient pipe flow. 4. Understand pipe performance and the influence of cavitation.
Course Outcomes	In this course students will be able to: CO1 Optimize the pipe diameter for a specified flow rate of a certain fluid CO2 Calculate the suitable pipe wall thickness for a specified pipe grade CO3 Estimate the net positive suction head for a simple pipe system CO4 Estimate the effect of fluid viscosity on the performance of centrifugal pumps CO5 Use the affinity laws to analyze centrifugal pump performance

Weekly Schedule of Topics

W	Topic
1	Introduction
2	Fluid properties and basic equations
3	Hydraulics of piping systems
4	Hydraulics of piping systems
5	Optimization of piping systems
6	Economics of piping systems
7	Analysis of pipe networks
8	Analysis of pipe networks
9	Pump performance and analysis
10	Pump performance and analysis
11	Cavitation and net positive suction head
12	Natural gas transmission
13	Major exams
14	Review

Professional Contribution	Ability to understand, apply, and use the numerical methods and tools in engineering

Contribution to Program Outcomes*

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

* 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	Fundamental knowledge about fluid mechanics.
Evaluation	Midterm Exam 40% Quizzes 20% Final Exam 40% Total 100%
Course Policy	1. You must attend at least 70% of the sessions including add-drop period. Otherwise, you will receive a grade of **NA**. 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. Illegal copies of the textbooks and other course materials cannot be used for the classwork and exams.
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. • A consequence of academic dishonesty is to receive a grade of FF for the course.

Instructor

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