Code: 0423211		Course Name: Hydraulics							
Year	Semester	Group(s)	Language		Theory	App	Lab.	Credit	ECTS
2023-2024	Fall	2, 3	English		2	1	1	3	5
Course Type		Basic Sciences☐	Engineering ■		Technical Elective ☐		Non-Technical Elective ☐		
Prerequisite		0422212 Fluid Mechanics							
Coordinator *		Prof. Dr. Yalçın Yüksel							
Instructor(s)		Prof. Dr. Esin Çevik, Assoc. Prof. Dr. Mehmet Öztürk							
Course Goals		The purpose of hydraulics, one of the practicing branches, is to introduce basic principles of hydraulics, to teach students the solutions of hydraulic structures problems and to discuss the design problems of structures.							
Course Topics		Pipe Flow / General Characteristics of Open Channel Flow / Uniform and Non-Uniform Flow in Open Channels / Physical Modeling / Introduction to Transient Flow / Introduction to Computational Hydraulics							
Knowledge and Skills		• Basic knowledge for the design of many hydraulic structures' problems for example dams, harbors, channels, breakwaters, etc. • How to reach and use knowledge							
References		1. "Hydraulics Lecture Notes" by Y. Yuksel and E. Cevik, 2022 2. "Fundamentals of Fluid Mechanics" by Munson, Young, Okiishi, John Wiley&Sons 3. "Fluid Mechanics" by F. M. White, 8th ed., McGraw-Hill. 4. "Open-Channel Hydraulics" by R. H. French, Mc. Graw Hill 5. "Open-Channel Hydraulics" by Ven Te Chow, Mc Graw Hill 6. "Akışkanlar Mekaniği ve Hidrolik" by Y. Yüksel, Beta Yayınevi, 6.Baskı, 2020 7. "Hidrolik Laboratuvar Deneyleri" 5. Bası, YTÜ Yayınları,2013							
Assignments and Projects									
Laboratory Experiment topics		1) Minor head losses in pipe flow 2) Hydraulic jump and channel transitions							
Computer codes									
Other Activities		1) Video and slide shows							
Contribution of the Course Towards Providing Professional Education		Basic knowledge for the design of many hydraulic structure's problems for example dams, harbors, channels, breakwaters, etc.							
Course Outcomes (Number needed)		1. Students will be able to solve hydraulic problems and learn the design of hydraulic structures. 2. Students will be able to do hydraulic engineering practices. Students will be able to experiment. 3. Students will learn the basics of design courses related to hydraulic engineering and gain the skills to understand these issues. 4. Students will gain the ability to solve basic equations of Hydraulic Engineering 5. Students will gain the ability to solve complex problems.							

Course Outcomes / Learning Outcomes Matrix	PÇ DÖÇ	1.3	2.1	2.2	3.1	3.2	5.2	5.3	5.4	
	1				X	X				
	2						X	X	X	
	3				X	X				
	4		X	X						
	5	X	X							

SUCCESS EVALUATION

Theoretical Courses			Project Courses and Graduation project		
	Number	Weight (%)		Number	Weight (%)
Midterms (M1 and M2)	2	(20 and 25)=45	Midterm(s)		
Quizzes	1	5	Controls		
Assignments			Mid-submission(s)		
Laboratory	2	(2x5=) 10	Oral Exam		
Other			Other		
Final Exam	1	40	Final Exam		
Make Up Exam	1	40	Make Up Exam		

COURSE SCHEDULE

1. Week (2 Oct. 23)	Review of Fluid Mechanics / Application Areas of Hydraulics/ Introduction to Pipe Flow	
2. Week (9 Oct.23)	Pipe Flow; Laminar Velocity Distribution, Turbulent Velocity Distribution	
3. Week (16 Oct.23)	Friction Head Loss / Minor Head Losses	**QUIZ1**
4. Week (23 Oct.23)	Various Pipe Problems	
5. Week (30 Oct.23)	Pipe Network	**LAB 1**
6. Week (6 Nov. 23)	Open Channel Hydraulics / Basic Concepts	
7. Week (13 Nov.23)	Steady Open Channel Hydraulics, Velocity and Pressure Gradient	
8. Week (20 Nov.23)		**MIDTERM1**
9. Week (27 Nov.23)	Energy Losses and Hydraulic Calculations in Channels / Non-uniform Open Channel Flow	
10. Week (4 Dec. 23)	Critical Flow	
11. Week (11 Dec. 23)	Rapidly Varied Flow / Hydraulic Jump	
12. Week (18 Dec. 23)	Channel Transitions / Gradually Varied Flow	**LAB 2**
13. Week (25 Dec. 23)	Computation of Gradually Varied Flow	**MIDTERM2**
14. Week (1 Jan. 24)	Hydraulic Models, Introduction to Computational Hydraulics	

FORM 2: COURSE COMMUNICATIONS

Course Code : 0423211		Course Name: 0423211				
Groups	**Classes and hours of courses**	**Instructor**	**Room number of instructors**	**Office hours**	**E-mail**	**Web address**
3	Monday 12:00-13:50 Thursday 12:00-13:50	Prof. Dr. Esin Çevik	H Block -08	Monday - 10^{00}-11^{50}	cevik@yildiz.edu.tr	www.inm.yildiz.edu.tr
2	Monday 12:00-13:50 Thursday 12:00-13:50	Assoc. Prof. Dr. Mehmet Öztürk	H Block - 01	Monday - 10^{00}-11^{50}	meozturk@yildiz.edu.tr	www.inm.yildiz.edu.tr

Date: 27/09/2023