ESOGU CIVIL ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
HYDRAULIC	151415364

Semester	Number of Course Hours per Week		ECTS
	Theory	Practice	
5	4	0	5

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
1	3	1		

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	
Objectives of the Course	Introducing behavior of actual flows in pipes, laminar and turbulent flows on the basis of knowledge gained from fluid mechanics, velocity and shear stress distribution analysis in cross section, introduction to of internal wall types, analyzing of friction and local loses, investigation of pumped flow systems, open channel flows, uniform flow and applications, investigation of fundamental concepts used in uniform flows in open channels, determination of water surface profiles in non-uniform flows in open channels, detailed analysis of water surface profile changes in contraction and expansion of cross-section members, introducing hydraulic jump concept, investigation of side weirs and channel control systems are the objectives of this course.
Short Course Content	Equations of motion, laminar and turbulent flows, internal wall types, loss of energy, friction and local losses, pumped flow systems, uniform flow in open channels, the concept of the optimum cross section, non-uniform flows in open channels, water surface profile types, changes in water surface profiles in contraction and expansion of cross-section elements, analysis of water surface profiles, lateral weirs and channel control systems.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Can describe the behavior of one-dimensional real fluids in a pipe.	1, 2, 5	1, 2	A
2	Can analyze the flows in a pipe.	1, 2, 5	1, 2, 10	A
3	Can analyze the flows in open channels	1, 2, 5, 8	1, 2, 10	A
4	Can analyze the flows in pipes and open channels and reach a solution to the issues applied in civil engineering.	1, 2, 5	1, 2	A
5				
6				
7				
8				

*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Induvidual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

**Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

Main Textbook	**Sümer, M., Ünsal, İ., Bayazıt, M., Hidrolik, Birsen Yayınevi,1983**
Supporting References	Sümer, M., Ünsal, İ., Bayazıt, M., Hidrolik, Birsen Yayınevi,1983 Yalçın Yüksel, Akışkanlar Mekaniği ve Hidrolik, 2000 Karahan, M. E., Boru ve Açık Kanal Hidroliği, Teknik Kitaplar Yayınevi, 1986. **White, F. M., Fluid Mechanics , 2nd Edition, Mc Graw-Hill, 1987** **Roberson, J. A., Cassidy, J. J., Chaudry, M. H., Hydraulic Engineering, John Wiley and Sons, 1995.**
Necessary Course Material	

Course Schedule	
1	Governing equations of fluid motion
2	Laminar and turbulent flows, wall types
3	Analysis of energy losses
4	Friction losses
5	local losses
6	Pumped flow systems
7	Uniform flows in open channels
8	Mid-Term Exam
9	The concept of the optimum cross section
10	Non-uniform flows in open channels
11	Non-uniform flows in open channels
12	Water surface profile types
13	Changes in water surface profile in contraction of cross-section
14	Analysis of water surface profile in expansion of cross-section
15	Lateral weirs and channel control systems
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	4	56
Classroom Studying Time (review, reinforcing, prestudy,….)	14	4	56
Homework			
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
	1	2	2
	1	15	15
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	15	15
Final Exam	14	4	56
Studying for Final Exam	14	4	56
	Total workload		146
	Total workload / 30		4,87
	Course ECTS Credit		5

Evaluation	
Activity Type	**%**
Mid-term	40
Quiz	
Homework	
Bir öğe seçin.	
Bir öğe seçin.	
Final Exam	60
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	Sufficient knowledge of engineering subjects related with mathematics, science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of engineering	4
2	Ability to determine, define, formulate and solve complex engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.	5
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that	
4	Ability to develop, select and use modern methods and tools required for engineering applications; ability to effective use of information technologies.	3
5	In order to investigate engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.	
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.	
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.	
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	3
9	Understanding of professional and ethical issues and taking responsibility	
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.	
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.	

LECTUTER(S)				
Prepared by	Prof. Dr. Ender DEMİREL			
Signature(s)				

Date:06.06.2024