

IM 420 GROUNDWATER		CIVIL ENGINEERING	
Semester	Credit Structure		
	Lecture	Recitation	Laboratory
7 or 8	3	0	0
Language	Turkish		
Compulsory / Elective	Elective		
Prerequisites	-		
Catalog Description	Occurrence of groundwater, aquifers, exploration of groundwater, groundwater motion, Darcy law, flow net, equations of motion of groundwater, hydraulics of wells, pumping tests, finite-aquifers and image method, fresh-salt water intrusion and prevention methods, drilling and construction of wells, filters.		
Course Objectives	To give the basic principles of groundwater motion		
Course Outcomes	Gaining the skill of handling and solving the problems related to groundwater		
Textbook and /or References	1-Todd, D.K., Groundwater Hydrology’, John Wiley & Sons. Inc., New York, 1980. 2-Walton, W.S., Groundwater Resource Evaluation’, McGraw-Hill, New York, 1970.		
Assessment Criteria		Quantity	Percentage
	Midterm Exams	2	50
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	1	50
Course Category by Content (%)	Mathematics and Basic Sciences	50	
	Engineering Science	40	
	Engineering Design	10	
	Social Sciences		
Instructors	Prof.Dr. İbrahim Gürer		

COURSE PLAN	
Week	Topics
1	Occurrence of groundwater and aquifers
2	Exploration of groundwater
3	Groundwater motion
4	Darcy law
5	Mid-Term Exam I
6	Flow net
7	Equations of groundwater motion
8	Hydraulics of wells
9	Interference of wells and pumping tests
10	Finite aquifers and image method
11	Mid-Term Exam II
12	Fresh-salt water intrusion
13	Construction of wells
14	Filters

RELATIONSHIP BETWEEN THE COURSE AND DEPARTMENT CURRICULUM				
	Program Outcomes	1	2	3
1	An ability to apply knowledge of mathematics, science, and engineering			X
2	An ability to design and conduct experiments, as well as to analyze and interpret data		X	
3	An ability to design a system, component, or process to meet desired needs		X	
4	An ability to function on multi-disciplinary teams		X	
5	An ability to identify, formulate, and solve engineering problems			X
6	An understanding of professional and ethical responsibility		X	
7	An ability for effective written and oral communication in Turkish and English		X	
8	The broad education necessary to understand the impact of engineering solutions in a global and societal context			X
9	A recognition of the need for, and ability to engage in life-long learning		X	
10	A knowledge of contemporary issues			X
11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice		X	
Contribution of the course : 1:None 2:Partially 3:Completely				