



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Groundwater Hydraulics							
Course Code		MCE533		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	200 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		Importance of groundwater in water supply practice and technical issues of groundwater usage, use of Darcy law in determination of groundwater characteristics, and giving advanced level technical information regarding groundwater to students.							
Course Content		Basic concepts, classification of groundwater reservoirs, aquifer types, well types, aquifer parameters, Darcy law, hydraulic load, piezometers, well losses, step drawdown test and determination of pump capacity, filter materials and calculation, well development.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Discussion, Case Study, Individual Study, Problem Solving					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Final Examination	1	50
Project	1	50

Recommended or Required Reading

1	Bouwer, H., 1978. Groundwater Hydrology. McGraw-Hill Book Co., New York, 480p
2	Bear, J. 1979. Hydraulics of groundwater. McGraw-Hill Book Co., New York, 567p
3	Fetter, C.W. 1980. Applied hydrogeology. Charles E. Merrill Publishing Co., 488 p.

Week	Weekly Detailed Course Contents	
1	Theoretical	Basic concepts
2	Theoretical	Classification of groundwater reservoirs
3	Theoretical	Aquifer types
4	Theoretical	Aquifer types
5	Theoretical	Well types
6	Theoretical	Groundwater flow types
7	Theoretical	Determination of aquifer parameters
8	Theoretical	Determination of aquifer parameters
9	Intermediate Exam	Midterm Exam
10	Theoretical	Field aquifer tests
11	Theoretical	Darcy law
12	Theoretical	Hydraulic load, piezometers and well losses
13	Theoretical	Step drawdown test and determination of pump capacity, filter materials
14	Theoretical	Well development
15	Theoretical	Well development
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	3	56
Assignment	4	0	15	60
Individual Work	10	0	4	40
Midterm Examination	1	20	2	22



Final Examination	1	20	2	22
Total Workload (Hours)				200
[Total Workload (Hours) / 25*] = ECTS				8
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Groundwater carrying geological layer identification
2	Classification of groundwater layers
3	Groundwater movement equation derivation for steady and unsteady flows
4	Groundwater type curve derivation for different aquifer types
5	Well hydraulics and well type identification
6	Determination of groundwater flow nets

Programme Outcomes (Civil Engineering (English) Master)

1	To be able to develop expertise knowledge in a civil engineering area founded on their graduate competence.
2	To be able to use the theoretical and practical expertise knowledge gained in their specialty area.
3	To be able to use the information, problem solving and / or practical skills from the field, in interdisciplinary studies.
4	To be able to create new knowledge by integrating their knowledge area with the knowledge coming from different disciplines; and solve problems that need expertise by using scientific research methods
5	To be able to solve the problems related to his/her area by using appropriate research methods
6	To be able to devise a problem in their specialty area, develop a solution methodology, solve the problem, and interpret the results and take action if necessary
7	To be able to criticize the knowledge in their specialty area, guide the learning process, and independently direct high level studies
8	To be able to systematically communicate the recent developments in their specialty area and their own studies to groups both inside and outside their specialty area, orally, in writing and visually
9	To be able to use computer software at a level required by their specialty area with drawing upon information and communication technology at a high level
10	To be able to introduce scientific, technological, social and cultural advancements in the field of civil engineering and to contribute to the process of being an information of the society and to sustain it.
11	To be conscious of professional and ethical responsibility and contribute to the establishment of this consciousness.
12	To be able to protect social, scientific, and ethical values during collection, interpretation, and dissemination stages of the data associated with their specialty area; instruct and supervise these values
13	To be able to use at least one foreign language in a level to follow current developments related to the field.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5	L6
P1	5	4	5	4	4	5
P2	4	5	4	5	5	5
P3	5	4	5	4	4	5
P4	4	4	4	5	5	5
P5	5	5	5	4	4	5
P6	4	5	4	5	5	4
P7	5	5	5	4	4	4
P8	4	4	4	5	5	4
P9	5	5	5	5	4	4
P10	4	4	4	5	5	5
P11	5	5	5	5	5	4
P12	5	5	4	5	5	5
P13	4	5	5	5	5	4

