

COURSE CATALOG

Course Code: CE 231				Course Name: Geology			
Semester	T + P + L	Credits	ECTS	Language of Instruction	Course Type	Instruction Methods	Prerequisite(s)
3	3 + 0 + 0	3	5	English	Required (D1)	Lecture	-
Course Objectives			Introduction of Earth sphere, minerals, sedimentary rocks, metamorphic rocks, tectonic, separation and formation of soil, geologic maps, surveys in geology, earthquakes, hydrogeology, dam geology, tunnel geology, transport geology.				
Topics Covered			Challenges of the 21st Century. The Earth and Its Systems. Minerals. Igneous Rocks and Processes. Sedimentary Rocks and Processes. Metamorphic Rocks and Processes. Mechanics of Earth Materials. Structural Deformation of the Earth's Crust and Earthquakes. Weathering and Erosion. Soils, Soil Hazards and Land Subsidence. Ground Water. Subsurface Contamination and Remediation. Mass Movement and Slope Stability. Rivers. Oceans and Coasts. Glaciers, Permafrost, and Deserts. Landslides. Material geology. Definition of minerals and rocks in laboratory.				
Learning Outcomes of the Course			<p>After the completion of this course, students should be able to:</p> <p>1- determine the basic types of earth materials, earth structures and earth processes and expected to link this information to Civil Engineering applications; [1,2,3,4,5]</p> <p>2 - learn the techniques used in geological studies; [5,6,7]</p> <p>3- learn the significance of the geological materials and processes in civil engineering applications; [13,14,15]</p> <p><i>[Note that the numbers in between the brackets address the bullet numbers in the program outcomes list.]</i></p>				
ISCED Category of the Course			52 Engineering				
Textbook			Essentials of Geology , Eleventh Edition, by Frederick K. Lutgens, Edward J. Tarbuck , and Dennis Tasa. Pearson, 11/E. 2012, 576 pages. ISBN-13: 978-0-321-70995-0.				
Recommended Sources			<p>1- Geology for Engineers and Environmental Scientists, by Alan E. Kehew. 3/E, Pearson</p> <p>2- Engineering Geology, by R.E. Goodman. John Wiley & Sons, Inc, 1993, New York, USA.</p> <p>3- F.G.H.A. Blyth, Geology for engineers, Edward Arnold, 1974, London, UK.</p>				

WEEKLY SCHEDULE

Week	Theoretical Topic	Applied / Laboratory Topics
1	Introduction. Geology, people and environment. Geologic time. Earth as a system. The rock cycle. Early evaluation of Earth. Earth' internal structure. Dynamic Earth.	
2	Minerals: building block of rocks. Atoms: building block of minerals. Isotopes and radioactive decay. Mineral groups. The silicates. Mineral resources.	
3	Rocks: Magma. Igneous processes. Igneous compositions. Origin of magma. How magmas evolve. Intrusive igneous activity. Mineral resources.	
4	The first midterm examination	
5	Volcanoes: Volcanic eruption. Materials extrude during an eruption. Volcanic structures. Other volcanic landforms. Plate tectonics and volcanic activity.	
6	Weathering and soils: Earth's external processes. Weathering. Rates of weathering. Soil. Controls of soil formation. Classifying soils. Soil erosion. Weathering and ore deposits.	
7	Sedimentary rocks: Origin of sedimentary rocks. Chemical sedimentary rocks. Coal. Turning sediment into sedimentary rock. Classification of sedimentary rocks. Energy resources.	
8	Metamorphism: Metamorphic textures. Common metamorphic rocks. Metamorphic environments. Metamorphic zones.	
9	Mass Wasting: Landslides and natural disasters. Controls and triggers of mass wasting. Slump. Rockslide. Debris flow. Earthflow. Slow movements.	
10	The second midterm examination	
11	Running water: The Hydrological cycle. Running water. Streamflow. The work of running water. Stream channels. Depositional landforms. Drainage	

	patters. Floods.	
12	Groundwater: A basic resource. The water table. Spring and wells. Artesian wells. Environmental problems. Geothermal energy. The geological work of groundwater.	
13	Earthquakes: Earthquakes and faults. Seismology. Locating the source of an earthquake. Size of an earthquake. Earthquake belts and plate boundaries. Earth's interior.	
14	Review. Geological institutions in Turkey. Geological applications in Turkey.	

COURSE ASSESSMENT POLICY

	Activities	Number	Contribution (%)
Studies throughout the term	Quizes	-	-
	Term Homework/ Project		
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homeworks	2	20
	Presentations	-	-
	Midterm Exams	2	40
	Project		
	Laboratory		
	Other (field work)		-
FINAL EXAM		1	40
Total			100

CONTRIBUTION OF THE COURSE TO CIVIL ENGINEERING PROGRAM OUTCOMES

Program Outcomes	1	2	3
1 The ability to apply knowledge of mathematics, science, and engineering			X
2 The ability to identify, formulate, and solve engineering problems			X
3 The ability to design a system or component to meet desired needs with realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability and sustainability			X
4 The ability to analyze and interpret data			X
5 The ability to design and conduct experiments and apply experimental results to improve processes			X
6 The ability to convey technical material through oral presentations and written papers/reports			X
7 The ability to function within multidisciplinary teams			X
8 The understanding of professional and ethical responsibilities		X	
9 The understanding of the impact of engineering on society		X	
10 The understanding of the necessity to engage in life-long learning		X	
11 The understanding of management and leadership principles and techniques		X	
12 The appreciation of the role of research in civil engineering problems		X	
13 A knowledge of contemporary issues in civil engineering			X
14 The ability to use modern engineering techniques, skills, and tools			X
15 The ability to understand and explain basic concepts in management, business, and leadership			X
16 A commitment to quality, punctuality and continuous improvement		X	

Contribution Level: 1 low, 2 medium, 3 high

ECTS-WORKLOAD TABLE

ACTIVITIES	Number	Duration (Hour)	Workload(Hour)
Lecture Time	14	3	42
Final Exam (Including Preperation Time)	1	16	16
Quizes			
Term Homework / Project	-	-	-

Reports			
Graduation Thesis/Project	-	-	-
Seminar			
Study Time Outside the Class	14	1	14
Homeworks	4	5	20
Presentations	-	-	-
Midterm Exams (Including Preparation Time)	2	16	32
Project			
Laboratory			
Total Workload			124
ECTS Credits of the Course (Total Workload / 25)			5

Last update on 20.01.2014	Coordinator / PREPARED BY Devrim Akca	APPROVED BY Esin İnan
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