COURSE CATALOG

Course Code: CE 239				**Course Name**: Earthworks			
Semester	**T + P + L**	**Credits**	**ECTS**	**Language of Instruction**	**Course Type**	**Instruction Methods**	**Prequisite(s)**
3	3 + 0 + 0	3	3	English	Required (D1)	Lecture	None
Course Objectives			To introduce students a fundamental knowledge of the earthworks required during highway construction.				
Topics Covered			Introduction. Land clearing and controls. Survey and measurement for earthworks. Soil types and properties. Cross-sectional area calculations. Volume calculations. Mass-haul diagrams. Excavation methods and equipment. Fill construction. Cost, productivity and management of earthworks.				
Learning Outcomes of the Course			The students who pass this course should: 1- gain basic knowledge of the earthworks and develop mathematical skills to perform the earthwork calculations [1, 2] 2- develop skills for area, volume and mass-haul calculations [1, 2, 4] 3- develop skills for computer usage of packages such as word, excel, matlab [14] 4- understand the practical applications of the earthworks concepts in designs of highways [8, 12, 13, 16] 5- understand the effects of soil types on earthworks calculations and highway design [4] *[Note that the numbers in brackets refer to the bullet numbers in the program outcomes list.]*				
ISCED Category of the Course			52 Engineering				
Textbook			H.L. Nichols, Moving the Earth: The Workbook of Excavation, McGraw Hill Professional, 1998.				
Recommended Sources			İ. Seçkin, Toprak İşleri ve Demiryolu, Çağlayan Kitabevi, 2003.				

WEEKLY SCHEDULE

Week	Theoretical Topic	Applied / Laboratory Topics
1	Introduction.	
2	Land clearing and controls.	
3	Survey and measurement for earthworks.	
4	Soil types and properties.	
5	Cross-sectional area calculations.	
6	Cross-sectional area calculations.	
7	Volume calculations.	
8	Volume calculations.	
9	Mass-haul diagrams.	
10	Mass-haul diagrams.	
11	Mass-haul diagrams.	
12	Excavation methods and equipment.	
13	Fill construction.	
14	Cost, productivity and management of earthworks.	

COURSE ASSESSMENT POLICY

	Activities	Number	Contribution (%)
Studies throughout the term	**Quizes**	-	-
	Term Homework/ Project	-	-
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homeworks	5	30

	Presentations	-	-
	Midterm Exams	2	35
	Project	-	-
	Laboratory	-	-
	Other (field work)	-	-
FINAL EXAM		1	35
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	2	28
Final Exam (Including Prepation Time)	1	13	13
Quizes	-	-	-
Term Homework / Project	-	-	-
Reports	-	-	-
Graduation Thesis/Project	-	-	-
Seminar	-	-	-
Study Time Outside the Class	14	1	14
Homeworks	5	2	10
Presentations	-	-	-
Midterm Exams (Including Prepation Time)	2	5	10
Project	-	-	-
Laboratory	-	-	-
Total Workload			75
ECTS Credits of the Course (Total Workload / 25)			3

Last update on 28.01.2014	**Coordinator / PREPARED BY Cihan BAYINDIR**	**APPROVED BY Esin İnan**