

COURSE CATALOG

Course Code: CE 232				Course Name: Surveying			
Semester	T + P + L	Credits	ECTS	Language of Instruction	Course Type	Instruction Methods	Prerequisite(s)
4	2 + 0 + 2	3	4	English	Required (D1)	Lecture + Laboratory	-
Course Objectives			Introduction to units, the errors of measurement, orthogonal method, theodolite and simple methods of angle measurement, polygonal, open and closed traverse, calculation of polygon coordinates, measurement of height, profiles and cross-section surface levelling, tachometry, application (layout).				
Topics Covered			Surveying Principles. Basics Of Surveying. Leveling. Distance Measurement. Angles And Directions. Total Stations and Theodolites. Total Station Applications. Traverse Surveys. Satellite Positioning Systems. Topographic Surveying And Mapping. Geographic Information Systems. Control Systems. Remote Sensing. Satellite Imagery. Airborne Imagery. Surveying Applications. Highway Curves. Construction Surveys. Land Surveying. Hydrographic Surveys. Random Errors. Trigonometric Definitions And Identities. Examples Of Current Geomatics Technology. Typical Field Projects.				
Learning Outcomes of the Course			<p>After the completion of this course, students should be able to:</p> <ol style="list-style-type: none"> 1- learn practical use of the basic surveying instruments, develop report writing and problem solving ability using field data and gain basic knowledge of surveying; [1,2,3,4,5] 2 - have knowledge on modern surveying equipments, e.g. electronic distance meters, total stations, GPSs, etc. [15,16] 3- perform leveling and to generate longitudinal profiles and cross sections [5,8] 4- understand the concepts and applications of Geographical Information Systems (GIS) and Global Positioning Systems (GPS) [15,16] <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			Charles D. Ghilani & Paul R. Wolf, Elementary Surveying , 11/E, Pearson, 2012.				
Recommended Sources			<ol style="list-style-type: none"> 1- Barry F. Kavanagh, Surveying, 8/E, Pearson, 2009. 2- Barry F. Kavanagh, Surveying with construction applications, 7/E, Pearson, 2010. 3- Uren, W.F. Price, Surveying for Engineers, Palgrave Macmillan, 2005. 				

WEEKLY SCHEDULE

Week	Theoretical Topic	Applied / Laboratory Topics
1	Introduction, history of surveying, specialized types of surveys, professional surveying organizations	
2	Units of measurement, units of length, area and volume measurements, units of angular measurement, conversion, map scales, rounding of numbers	A simple software development that converts angles in different units
3	Errors in observations direct observations, indirect observations, types of errors, systematic errors, random errors, mistakes, examples	A simple software that computes the basic error metrics
4	Field reconnaissance, ground sketching, point markers, determining the directions in the field	
5	Distance measurement, steel tape, and electronic distance measurement	Fieldwork (distance measurement)
6	The first midterm examination	
7	Angular measurement, horizontal angles, vertical angles, errors in angular measurements	Fieldwork (go & return)
8	Fundamental computations, azimuth, computation of coordinates <lec> Levelling, error sources in levelling	A simple software development that computes the fundamental computations
9	Levelling, error sources in levelling	Fieldwork (levelling)
10	The second midterm examination	
11	Tacheometry and point coordinates of feature points	Fieldwork (profile levelling)
12	Area computations, area by coordinates, area by division into simple figures, area by offsets from straight lines	A simple software development that computes the area with coordinate values
13	Volumes, the cross-section method, types of cross sections, contour area method	Fieldwork (volume computation)

14	Geographical Information Systems (GIS) and Global Positioning System (GPS)	
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COURSE ASSESSMENT POLICY

	Activities	Number	Contribution (%)
Studies throughout the term	Quizzes	-	-
	Term Homework/ Project		
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homeworks	-	-
	Presentations	-	-
	Midterm Exams	2	40
	Project		
	Laboratory	1	10
Other (field work)	1	10	
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	2	28
Final Exam (Including Prepartion Time)	1	16	16
Quizzes			
Term Homework / Project	-	-	-
Reports			
Graduation Thesis/Project	-	-	-
Seminar			
Study Time Outside the Class	14	1	14
Homeworks	5	2	10

Presentations	-	-	-
Midterm Exams (Including Preparation Time)	2	8	16
Project	8	2	16
Laboratory	6	2	12
Total Workload			100
ECTS Credits of the Course (Total Workload / 25)			4

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