

COURSE CATALOG

Course Code: CE 311				Course Name: Structural Analysis I			
Semester	T + P + L	Credits	ECTS	Language of Instruction	Course Type	Instruction Methods	Prerequisite(s)
5	3 + 1 + 0	3	7	English	Required (D1)	Lecture	CE 102
Course Objectives			To analyze the statically determinate planar linear structural systems such as simple beams, cantilever beams, three hinged arches or frames, or compound structural systems and trusses subjected to dead and/or moving loads, to draw internal force diagrams and to calculate the displacements.				
Topics Covered			Introduction to Structural Engineering and structural systems, General assumptions, External effects, Idealizations and definitions of 2D planar systems, Equilibrium equations and support reactions, Determination of the internal forces, Review of differential relationships between loads shear forces and moments, Internal force diagrams and effective usage of w tables, Review of special structural configurations such as continuous beam with intermediate hinges namely Gerber beams, three hinged systems, trusses etc., Type of moving loads and influence lines, Determinations of displacements by virtual work theorem and conjugate beam method, Introduction to the analyses of statically indeterminate systems by force method.				
Learning Outcomes of the Course			After completing this course students should gain: Learn how to analyze statically determinate structures. [2,4] Get knowledge on various types of structures and their behaviour. [2,4] Learn the analysis of structures subject to dead loads and moving loads, [2,4] <i>[Note that the numbers in between the brackets address the bullet numbers in the program outcomes list.]</i>				
ISCED Category of the Course			52 Engineerin				
Textbook			K.M.Leet,C.M.Uang,A.M. Gilbert.'Fundamental of Structural Analysis'McGraw-Hill,2010,(Fourth Edition)				
Recommended Sources			1. R.C.Hibbeler,'Structural Analysis'Prentice Hall 2011,(8 th Ed.) 2-A.E.Armenakes,' Classical Structural Analysis',A Modern Approach,Mc.Graw-Hill,1988. 3-C.H.Norris,J.B.Wilbur,I.Utku,'Elementary Structural Analysis',Mc.Graw-Hill,1991. 4- F.Karadogan,S.Pala,E.Yuksel,Y.Durgun,'Yapı Mühendisliğine Giriş-Yapısal Çözümleme,Cilt I,Birsen Yayınevi,Istanbul,2011.				

WEEKLY SCHEDULE

Week	Theoretical Topic	Applied / Laboratory Topics
1	Introduction to structural systems.	
2	Assumptions and idealizations of structural analyses.	
3	External Effects: Load types.	
4	Support reactions, internal forces, equilibrium equations.	
5	Numerical Examples- Problem sessions.	
6	Simplified Approaches to determine Internal Forces : Axial Force, Shear Force and Bending moments at critical sections.	
7	Internal Forces diagrams of Planar systems such as simple beams, cantilever beams,	
8	Numerical examples in Problem session format	
9	Internal Forces diagrams of Planar systems such as Continuous beams, frames and arches,	
10	2D trusses. Different techniques to obtain member forces.	
11	Numerical examples in Problem session format	
12	Determination of displacements by virtual work theorem	
13	Introduction to statically Indeterminate systems	

14	Influence lines.	
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COURSE ASSESSMENT POLICY

	Activities	Number	Contribution (%)
Studies throughout the term	Quiz	3	10
	Term Homework/ Project		
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homework	5	10
	Presentations	-	-
	Midterm Exams	2	30
	Project		
	Laboratory	-	-
	Other (field work)	-	-
FINAL EXAM		1	50
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	4	56
Final Exam (Including Preperation Time)	1	18	18
Quize	3	5	15
Term Homework / Project	-	-	-
Reports			
Graduation Thesis/Project	-	-	-
Seminar			
Study Time Outside the Class	14	2	28
Homeworks	5	7	35
Presentations	-	-	-
Midterm Exams (Including Preperation Time)	2	14	28
Project	-	-	-

Laboratory	-	-	-
Total Workload			180
ECTS Credits of the Course (Total Workload / 25)			7

Last update on 19.01.2014	Coordinator / PREPARED BY Faruk Karadođan	APPROVED BY Esin İnan
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