

COURSE CATALOG

Course Code: CE 312				Course Name: Structural Analysis II			
Semester	T + P + L	Credits	ECTS	Language of Instruction	Course Type	Instruction Methods	Prerequisite(s)
6	3 + 1 + 0	3	6	English	Required (D1)	Lecture	CE 311 Structural Analysis I
Course Objectives			To analyses the statically indeterminate structural systems subjected to external effects such as dead loads, moving loads, temperature changes, support settlement ,by means of force , slope deflection and moment distribution method .				
Topics Covered			Review of the analysis of indeterminate structures subjected to external loads by means of force method; selection of proper primary systems. Taking into consideration other External Effects such as Temperature Changes, Support Settlements. Determination of displacements ; Reduction Theorem , Analyses of structures with semi rigid support and connections, Introduction to the analysis of indeterminate structures subjected to moving loads ; Influence Lines. Estimation of the shape of the Influence Lines and unfavorable load combinations. Utilization of Statically Indeterminate primary systems. Introduction to Slope Deflection Method to analyse simple structures subjected to external loads only. Introduction to the Method of Moment Distribution. Generalization of Slope Deflection Method to analyse the Frame type structures with sway taking into consideration the special external effects such as temperature changes and support settlements.				
Learning Outcomes of the Course			After completing this course students should gain: 1-an ability to analyze statically indeterminate systems subjected to external loads, [2,4] 2- an ability to estimate the expected behavior of different type of structures, [2,4] 3-an ability to enlarge the skill of structural analyses to cover the effects of moving loads, temperature changes and support settlements, [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 Engineering				
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,İ.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	Review of the analysis of indeterminate structures subjected to external loads by means of force method, Numerical examples.	
2	Selection of proper primary systems, Other external effects such as temperature changes, Support settlements, Numerical examples for temperature changes .	
3	Numerical examples for Support Settlements, Determination of displacements ; Reduction Theorem , Numerical examples.	
4	Definitions of semi rigid supports and connections Analyses of structures with semi rigid support and connections Numerical examples.	
5	Determination of displacements of structures with elastic support and elastic connections , Numerical examples, Introduction to the analysis of indeterminate structures subjected to moving loads ; Influence Lines.	
6	Influence lines (continuation) , numerical examples .	
7	Estimation of the shape of the influence lines, Unfavorable load combinations, Numerical examples.	
8	Statically Indeterminate primary systems , Numerical Examples	
9	Introduction to Slope Deflection Method to analyse simple structures subjected to external loads only.	

	Unknowns and Classification of structural systems, Definitions of stiffness coefficients , Fixed end moments and shear forces; Numerical Examples	
10	Relationships between end displacements and end forces Structures which can be analyzed only by means of nodal moment equilibrium equations ; Numerical Examples	
11	Special structural features such as existing of cantilevers, symmetry , semi rigid connections and supports; Numerical Examples	
12	Introduction to the Method of Moment Distribution Carry over factors, schematic moment distribution; Numerical Examples	
13	Generalization of Slope Deflection Method ; Analyses of frame Structures with sway ; Numerical Examples	
14	Taking into consideration the special external effects such as temperature changes , support settlements; Numerical examples	

COURSE ASSESSMENT POLICY

	Activities	Number	Contribution (%)
Studies throughout the term	Quiz	3	10
	Term Homework/ Project		
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homeworks	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	3	42
Final Exam (Including Preperation Time)	1	18	18

Quizes			
Term Homework / Project	-	-	-
Reports			
Graduation Thesis/Project	-	-	-
Seminar			
Study Time Outside the Class	14	2	28
Homeworks	5	6	30
Presentations	-	-	-
Midterm Exams (Including Prepatation Time)	2	11	22
Project	-	-	-
Laboratory	-	-	-
Total Workload			140
ECTS Credits of the Course (Total Workload / 25)			6

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