



**ESOGU CIVIL ENGINEERING DEPARTMENT
COURSE INFORMATION FORM**

Course Title	Course Code
STRUCTURAL ANALYSIS I	151415362

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
5	4		5

Course ECTS Credit Distribution				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	3	2		

Language of Instruction	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite	
Objectives of the Course	Determination of the performance characteristics of statically determinate structures such as support reactions, internal forces, slope and displacement at certain points under the effect of design loads.
Brief Course Content	Assumptions, principles of equilibrium in determining reactions, bending moments and shear diagrams. Influence lines. Determination of displacements by virtual work. Virtual work, strain energy. Introduction to computer programs and use of program packages for structural analysis.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 To be aware of building analysis and design and regulations.	1, 2, 3, 4	1, 6,10	A, B/D
2 Analyze statically determinate structures	1, 2, 3, 4	1, 6,10	A, B/D
3 Calculate deflection of structures using Integration Methods / virtual work	1, 2, 3, 4	1, 6,10	A, B/D
4 Draw influence lines and determine the max values of internal forces	1, 2, 3, 4	1, 6,10	A, B/D
5			
6			
7			
8			

*Teaching Methods 1:Lecture, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation
 **Assessment Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

**Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

Main Textbook	1. Bryant G. NIELSON & Jack C McCORMAC, Structural Analysis, Wiley 2017 2. K. M. LEET, C. M. UANG, A. M. GILBERT, Fundamentals of Structural Analysis, McGraw- Hill, 2008
Supplementary Resources	1. F. Karadoğan, S. Pala, E.Yüksel, Y. Durgun, Yapısal Çözümleme, Cilt 1, Birsen Yayınevi, 2011 2. M. Ruhi AYDIN, Yapı Statığı Cilt I, Esogü yayın no:70 3. SAP 2000
Necessary Course Material	

Course Weekly Schedule	
1	Introduction to structural analysis and design. Basic principles of structural analysis. Structural components and systems. Structural forces.
2	Structural loads. Structural safety. Codes, standards and specifications. Types of structural loads. Loading conditions for the strength design. Dead loads, Live loads. Live loads on roofs. Snow loads. Wind loads. Seismic loads.
3	Vertical system loading and behavior. Structural idealization. Load path. Tributary areas. Slab behavior. Influence area. Floor live load reductions. Columns in multistory buildings
4	Lateral system loading and behavior. Lateral load path. Vertical lateral force resisting systems. Diaphragms. Tributary approach.
5	Reactions
6	Axial Force, Shear Force and Bending Moment.
7	Gerber systems, arches, frames
8	Mid-Term Exams
9	Analysis of trusses
10	Simple-compound-complex trusses
11	Deflections and Angle Changes in statically determinate structures by double integration method.
12	Deflections and Angle Changes in statically determinate structures by virtual work method.
13	influence lines for support reactions, shear and bending moments
14	Introduction to statically indeterminate structures
15	
16,17	Final Exams

Calculation of Course Workload			
Activities	Count	Time (Hour)	Total Workload (Hour)
Weekly classroom time	14	4	56
Weekly study time (review, reinforcing, preparation)	14	4	56
Homework	5	5	25
Taking a quiz			
Studying for a quiz			
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	5	5
Final Exam	1	2	2
Studying for Final Exam	1	5	5
Total workload			151
Total workload / 30			5.03
Course ECTS Credit			5

Assessment	
Activity Type	%
Mid-term	30
Quiz	
Homework	20
Bir öge seçin.	
Bir öge seçin.	
Final Exam	50
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	Sufficient knowledge of engineering subjects related with mathematics, science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of engineering problems.	4
2	Ability to determine, define, formulate and solve complex engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.	5
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that	5
4	Ability to develop, select and use modern methods and tools required for engineering applications; ability to effective use of information technologies.	4
5	In order to investigate engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.	
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.	
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.	
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	3
9	Understanding of professional and ethical issues and taking responsibility	4
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.	
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.	4

INSTRUCTORS				
Prepared by	Prof.Dr. Yunus Özçelikörs	Ass.Prof.Dr. Hakan Erol		

Date:17.07.2024