



**HASAN KALYONCU UNIVERSITY**  
**Faculty of Engineering**  
**Course Description Form**

<b>COURSE:</b> Structural Analysis					
<b>CODE:</b> CE321		<b>SEMESTER:</b> FALL			
<b>LANGUAGE:</b> ENGLISH		<b>TYPE:</b> COMPULSORY			
<b>PRE-REQUISITES:</b> - <b>CO-REQUISITES:</b> -		<b>THEORY</b>	<b>PRACTICAL</b>	<b>CREDIT</b>	<b>ECTS</b>
<b>WEEKLY HOURS:</b> 4		4	0	4	5

**CONTENT OF THE COURSE:**

Types of structures, Supports and loads. Idealization of structures and loads. Geometric stability and determinacy. Analysis of determinate trusses, beams, plane frames and arches; reaction computation; axial force, shear force and bending moment diagrams. Influence lines of determinate structures. Introduction to indeterminate structures.

**OBJECTIVE OF THE COURSE:**

To enable students to understand and apply the concepts of structural analysis on different types of statically determinate structures (beams, frames, trusses) subjected to dead loads and moving loads.

**WEEKLY SCHEDULE AND PRE-STUDY PAGES**

<b>Week</b>	<b>Topics</b>
1	Chapter A: Types of Structures and Loads
2	Chapter A: Types of Structures and Loads
3	Chapter A: Types of Structures and Loads
4	Chapter B: Analysis of Statically Determinate Structures
5	Chapter B: Analysis of Statically Determinate Structures
6	Chapter C: Analysis of Statically Determinate Trusses
7	Chapter C: Analysis of Statically Determinate Trusses
8	Midterm Week
9	Chapter D: Internal Loads Developed in Structural Members
10	Chapter D: Internal Loads Developed in Structural Members
11	Chapter D: Internal Loads Developed in Structural Members
12	Chapter E: Influence Lines for Statically Determinate Structures
13	Chapter E: Influence Lines for Statically Determinate Structures
14	Chapter E: Influence Lines for Statically Determinate Structures

- **TEXTBOOK: Russell G. Hibbeler, “Structural Analysis”, 10th edition, Pearson Prentice – Hall, 2017.**

**REFERENCE BOOKS**

- Chajes, “Structural Analysis”, Latest edition, Pearson Prentice – Hall.
- Reddy C.S., “Basic Structural Analysis”, Tata McGraw Hill, (Latest edition).
- Pandit & Gupta, “Matrix Methods in Structural Analysis”, Tata McGraw Hill.

- Junnarkar S.B., “Structural Mechanics”, Vol II, Charotar Publishers, (Latest edition).
- Wang C.K., “Intermediate Structural Analysis”, Tata McGraw Hill, (Latest edition).
- Negi L.S. & Jangid R.S., “Structural Analysis”, Tata McGraw Hill, (Latest edition).
- Yuan Yu Hsieh, “Elementary Theory of Structures”, Pearson Prentice Hall, (Latest edition).
- Chajes A., “Structural Analysis”, Pearson Prentice Hall, (Latest edition).

<b>EVALUATION SYSTEM:</b>		
<b>IN-TERM STUDIES</b>	<b>QUANTITY</b>	<b>PERCENTAGE (%)</b>
Midterm Exam	1	30
Homework	4	20
Laboratory works	0	0
Quiz	0	0
Final Exam	1	50
<b>TOTAL</b>	<b>6</b>	<b>100</b>
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	5	50
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	50
<b>TOTAL</b>	<b>6</b>	<b>100</b>

<b>COURSE CATEGORY:</b>	<b>PERCENTAGE (%)</b>
Mathematics and Basic Sciences	30%
Engineering	40%
Engineering Design	30%
Social Sciences	0

<b>TABLE OF ECTS / WORKLOAD:</b>			
<b>Activities</b>	<b>QUANTITY</b>	<b>Duration (Hour)</b>	<b>Total Workload</b>
Course Duration	13	4	52
Hours for off-the-classroom study (Pre-study, practice)	14	5	70
Laboratory works	0	0	0
Mid-term	1	2	2
Final examination	1	2	2
Homework	4	2	8
Quiz	0	0	0
<b>Total Work Load</b>			<b>134</b>

<b>Total Work Load / 30</b>			<b>4,5</b>
<b>ECTS Credit of the Course</b>			<b>5</b>

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>
<b>LO1</b>	0	3	3	3	0	0	0	0	0	0	0
<b>LO2</b>	0	3	3	3	0	0	0	0	0	0	0
<b>LO3</b>	0	3	3	3	0	0	0	0	0	0	0
<b>LO4</b>	0	3	3	3	0	0	0	0	0	0	0
<b>LO5</b>	0	3	3	3	0	0	0	0	0	0	0
PO: Program Outcomes   LO: Learning Outcomes Values: 0: None   1: Low   2: Medium   3: High											

<b>INSTRUCTOR(S):</b>	Assoc. Prof. Dr. Amjad Khabaz
<b>FORM PREPARATION DATE:</b>	22.05.2019

<b>LEARNING OUTCOMES OF THE COURSE:</b>	<b>PROGRAM OUTCOMES:</b>
<p><b>LO1:</b> To analyze statically determinate structures (beams, frames and trusses)</p> <p><b>LO2:</b> To draw normal force, shear force and bending moment's diagrams</p> <p><b>LO3:</b> To construct influence lines functions at critical sections and determination the maximum values of these functions due to different types of moving loads in statically determinate structures</p> <p><b>LO4:</b> To calculate the forces at truss members using section and joint method</p> <p><b>LO5:</b> To get an idea about indeterminate structures</p>	<p><b>PO1:</b> Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems.</p> <p><b>PO2:</b> Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.</p> <p><b>PO3:</b> Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.</p> <p><b>PO4:</b> Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively.</p> <p><b>PO5:</b> Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.</p> <p><b>PO6:</b> Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.</p> <p><b>PO7:</b> Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.</p> <p><b>PO8:</b> Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.</p>

	<p><b>PO9:</b> Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice.</p> <p><b>PO10:</b> Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.</p> <p><b>PO11:</b> Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.</p>
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