YEDİTEPE UNIVERSITY
FACULTY OF ENGINEERING

COURSE DESCRIPTION FORM

COVER PAGE

2022/2023-2

Course Code & Name	CE381 STRUCTURAL ANALYSIS

Course Schedule	Monday 14.00-15.50; Thursday 13.00-15.50
Room	B0425
Instructor's Name **Phone** **E-mail** **Office Hours**	Asst. Prof. Dr. Özden Saygılı 0216-578 00 00 / 1537 ozden.saygili@yeditepe.edu.tr Monday 11:00-13:00 Thursday 10:00-12:00
Assistant's Name **Phone** **E-mail**	Emin Gazi Kaşıkçı 0216-578 00 00 / 3227
Midterm Dates	
Additional Information	MIDTERM 20% ASSIGNMENT (8) 10% FINAL 70% MIDTERM • Statically determinate systems FINAL • Statically indeterminate systems Force Method Slope Deflection Method Moment Distribution Method **To successfully complete the course, it is imperative to obtain a minimum score of 50 in the final examination.**

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COURSE DESCRIPTION FORM

COURSE INFORMATON				
Course Code	**CE 381**	**Course Title**	**STRUCTURAL ANALYSIS**	
Semester	*Credits*	*ECTS*	*C +P + L Hour*	Prerequisites
5	4	5	3+2+0	CE 236: Mechanics of Materials

Language of Instruction	**Course Level**	**Course Type**
English	Bachelor of Science (First Cycle Courses)	Core

Course Coordinator	Asst. Prof. Dr. Özden Saygılı
Instructors	Asst. Prof. Dr. Özden Saygılı
Assistants	Emin Gazi Kaşıkçı
Goals	The goal of this course is to study the methods for analysis of statically determinate and indeterminate systems under various loadings.
Content	Analysis of statically determinate systems Response of statically determinate systems under moving loads Analysis of statically indeterminate systems using Force Method. Analysis of statically indeterminate systems for temperature gradient and support settlements using Force Method. Analysis of statically indeterminate systems using Displacement Methods of Analysis (Slope-Deflection Method and Moment Distribution Method)
Contribution of the Course to the Professional Education	The student who takes this course learns the methods required for the analysis of statically determinate and indeterminate systems under various loadings.

Course Learning Outcomes	**Detailed Program Outcomes**	**Teaching Methods**	**Assessment Methods**
Ability to draw internal force diagrams of statically determinate systems	1a, 1b, 2a, 6c	1, 2, 3	A, B
Ability to draw internal force diagrams of statically determinate systems under moving loads	1a, 1b, 2a, 6c	1, 2, 3	B
Ability to draw internal force diagrams of statically indeterminate systems using Force Method	1a, 1b, 2a, 2b, 6c	1, 2, 3	A, B
Ability to draw internal force diagrams of statically indeterminate systems for temperature gradient and support settlements using Force Method.	1a, 1b, 2a, 2b, 6c	1, 2, 3	B
Ability to draw internal force diagrams of statically indeterminate systems using Slope-Deflection Method.	1a, 1b, 2a, 2b, 6c	1, 2, 3	A, B

Ability to draw internal force diagrams of statically indeterminate systems using Moment Distribution Method	1a, 1b, 2a, 2b, 6c	1, 2, 3	A, B

Teaching Methods:	1: Lecture, 2: Problem solving by instructor, 3: Problem solving assignment
Assessment Methods:	A: Written exam, B: Homework

COURSE CONTENT

Week	Topics	Study Materials
1	Drawing internal force diagrams of statically determinate systems	Lecture Notes and Textbook
2	Drawing internal force diagrams of statically determinate systems	Lecture Notes and Textbook
3	Drawing internal force diagrams of Gerber systems	Lecture Notes and Textbook
4	Constructing influence lines for statically determinate systems	Lecture Notes and Textbook
5	Introduction to statically indeterminate systems-advantages-disadvantages, methods of analysis MIDTERM I	Lecture Notes and Textbook
6	Drawing internal force diagrams of statically indeterminate systems using Force Method	Lecture Notes and Textbook
7	Drawing internal force diagrams of statically indeterminate systems using Force Method	Lecture Notes and Textbook
8	Drawing internal force diagrams of statically indeterminate systems for temperature gradient using Force Method.	Lecture Notes and Textbook
9	Drawing internal force diagrams of statically indeterminate systems for support settlements using Force Method.	Lecture Notes and Textbook
10	Drawing internal force diagrams of statically ideterminate systems using Force Method MIDTERM II	Lecture Notes and Textbook
11	Drawing internal force diagrams of statically indeterminate systems using Slope-Deflection Method	Lecture Notes and Textbook
12	Drawing internal force diagrams of statically indeterminate systems using Slope-Deflection Method	Lecture Notes and Textbook
13	Drawing internal force diagrams of statically indeterminate systems using Moment Distribution Method	Lecture Notes and Textbook
14	Drawing internal force diagrams of statically indeterminate systems using Moment Distribution Method	Lecture Notes and Textbook

RECOMMENDED SOURCES	
Textbook	These are the notes that the students wrote during the lectures.
Additional Resources	✓ İzostatik Hiperstatik Sistemler, Yapı Statiği Çözümlü Problemler, Konuralp Girgin, M. Günhan Aksoylu, Yavuz Durgun, Kutlu Darılmaz. Birsen Yayınevi, 2015 ✓ Hiperstatik Sistemler, Yapı Statiği Çözümlü Problemler, Konuralp Girgin, M. Günhan Aksoylu, Kutlu Darılmaz. Birsen Yayınevi. 2017. ✓ Structural Analysis, Hibbeler, R.C. ISBN-13: 978-0-13-257053-4

MATERIAL SHARING	
Documents	
Assignments	Assignments are returned to students after they are graded.
Exams	Exams questions are solved if demanded.

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Midterm I (20%)	1	34
Midterm II (30%)	1	50
Assignments (10%)	8	16
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		**100**

COURSE CATEGORY	Field Course

COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES		
No	Program Learning Outcomes	check √
1a	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline,	√
1b	Ability to use theoretical and applied knowledge in these areas in complex engineering problems.	√
2a	Ability to identify, formulate, and solve complex engineering problems,	√
2b	Ability to select and apply proper analysis and modeling methods for this purpose.	√
3a	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,	
3b	Ability to apply modern design methods for this purpose.	
4a	Ability to devise, select and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice.	
4b	Ability to employ information technologies effectively.	
5a	Ability to design experiments for investigating complex engineering problems or discipline specific research questions,	
5b	Ability to conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.	
6a	Ability to work efficiently in intra-disciplinary teams,	
6b	Ability to work efficiently in multi-disciplinary teams,	
6c	Ability to work individually.	√
7a	Ability to communicate effectively in Turkish, both orally and in writing,	
7b	Knowledge of a minimum of one foreign language,	
7c	Ability to write effective reports and comprehend written reports, prepare design and production reports,	
7d	Ability to make effective presentations,	
7e	Ability to give and receive clear and intelligible instructions.	
8a	Recognition of the need for lifelong learning, ability to access information, ability to follow developments in science and technology,	
8b	Ability to continue to educate him/herself.	
9a	Consciousness to behave according to ethical principles and professional and ethical responsibility.	
9b	Knowledge on standards used in engineering practice.	
10a	Knowledge about business life practices such as project management, risk management, change management.	
10b	Awareness in entrepreneurship and innovation.	
10c	Knowledge about sustainable development.	
11a	Knowledge about the global and social effects of engineering practices on health, environment, and safety,	
11b	Knowledge about contemporary issues of the century reflected into the field of engineering.	
11c	Awareness of the legal consequences of engineering solutions.	
12	Knowledge about project award mechanisms and tendering procedures.	
13	Knowledge about the interaction of designers and constructors.	

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration	14	5	70
Hours for off-the-classroom study (Pre-study, practice)	14	3	42
Midterm	2	2	4
Assignment	8	2	16
Final	1	2	2
Total Work Load			134
Total Work Load / 25 (h)			5.36
ECTS Credit of the Course			5

Prepared by: Asst. Prof. Dr. Özden Saygılı	Preparation date: 01/02/2023