



COURSE INFORMATION FORM

Course Name	Course Code
EARTHQUAKE RESISTANT DESIGN	151417642

Semester	Number of Course Hours per Week		ECTS
	Theory	Practice	
7	3	0	5

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	X			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

<b>Prerequisite(s) if any</b>	-
<b>Objectives of the Course</b>	The purpose of this course is to introduce students to the behavior, analysis, and design rules of structures under earthquake effects.
<b>Short Course Content</b>	Single Degree of Freedom Systems, Multi-Degree of Freedom Systems, Irregularities According to TBDY 2018, Determination of Earthquake Loads According to TBDY 2018, Earthquake-Resistant Design of Structural Elements

Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1 Possess basic knowledge on ground movements.	2, 9	1, 5, 10	A, K
2 Can create lumped mass models for load-bearing systems and calculate their responses to ground movements.	1, 2	1, 5, 10	A, K
3 Learns the general principles of the rules provided in TBDY 2018.	9, 11	1, 5, 10	A, K
4 Can calculate design earthquake loads for structures according to TBDY 2018.	1, 2	1, 5, 10	A, K
5 Can perform earthquake-resistant design of reinforced concrete structures and structural elements.	1, 9, 11	1, 5, 10	A, K
6			
7			
8			

\*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

<b>Main Textbook</b>	Lecture Notes
<b>Supporting References</b>	Chopra A.K., Yapı Dinamiği (Çeviri), Palme Yayıncılık, 2021. Celep, Z., Deprem Mühendisliğine Giriş ve Depreme Dayanıklı Yapı Tasarımı, Beta Basım Yayım, 2022.
<b>Necessary Course Material</b>	Calculator, notebook, pencil, eraser

<b>Course Schedule</b>	
<b>1</b>	Basic Seismology Knowledge
<b>2</b>	Free Vibration of Single Degree of Freedom Systems
<b>3</b>	Forced Vibration of Single Degree of Freedom Systems
<b>4</b>	Earthquake Response of Single Degree of Freedom Systems
<b>5</b>	Free Vibration of Multi-Degree of Freedom Systems
<b>6</b>	Forced Vibration of Multi-Degree of Freedom Systems
<b>7</b>	Earthquake Response of Multi-Degree of Freedom Systems
<b>8</b>	Mid-Term Exam
<b>9</b>	Overview of TBDY (2018)
<b>10</b>	Determination of Earthquake Load According to TBDY (2018) I: Modal Combination Method
<b>11</b>	Determination of Earthquake Load According to TBDY (2018) II: Equivalent Earthquake Load Method
<b>12</b>	Irregular Structures and Control of Irregularities According to TBDY (2018)
<b>13</b>	General Rules and Recommendations for Load-Bearing System Design
<b>14</b>	Earthquake-Resistant Design of Reinforced Concrete Columns and Shear Walls
<b>15</b>	Earthquake-Resistant Design of Reinforced Concrete Beams and Slabs
<b>16,17</b>	Final Exam

<b>Calculation of Course Workload</b>			
<b>Activities</b>	<b>Number</b>	<b>Time (Hour)</b>	<b>Total Workload (Hour)</b>
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,...)	14	3	42
Homework	0	0	0
Quiz Exam	0	0	0
Studying for Quiz Exam	0	0	0
Oral exam	0	0	0
Studying for Oral Exam	0	0	0
Report (Preparation and presentation time included)	0	0	0
Project (Preparation and presentation time included)	0	0	0
Presentation (Preparation time included)	0	0	0
Mid-Term Exam	1	1.5	1.5
Studying for Mid-Term Exam	1	20	20
Final Exam	1	1.5	1.5
Studying for Final Exam	1	30	30
<b>Total workload</b>			<b>137</b>
<b>Total workload / 30</b>			<b>4.57</b>
<b>Course ECTS Credit</b>			<b>5</b>

Evaluation	
<b>Activity Type</b>	<b>%</b>
Mid-term	35
Quiz	
Homework	
Bir öge seçin.	
Bir öge seçin.	
<b>Final Exam</b>	<b>65</b>
<b>Total</b>	<b>100</b>

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	Strong background in mathematics, science, and fundamental engineering principles; ability to apply theoretical and practical knowledge from these fields to model and solve engineering problems	4
2	Expertise in identifying, defining, and formulating complex engineering problems in civil engineering and related fields. Ability to select and apply appropriate analysis and modeling methods to solve these problems	4
3	Ability to design complex systems, devices, or products under realistic constraints and conditions. Proficiency in using modern design methods to meet specific objectives	
4	Competence in developing, selecting, and using modern techniques and tools for civil engineering applications. Effective utilization of information technologies to support engineering tasks	
5	Expertise in designing experiments, conducting tests, collecting data, analyzing results, and interpreting findings for civil engineering problem investigations	
6	Ability to work effectively in both intradisciplinary and interdisciplinary teams	
7	Effective Turkish oral and written communication skills and proficiency in using and developing foreign language skills	
8	Commitment to lifelong learning. Ability to access information, stay up-to-date with advances in science and technology, and continuously self-improve	
9	Strong sense of professional and ethical responsibility	4
10	Knowledge of project management, risk management, and change management practices; awareness of entrepreneurship, innovation, and sustainable development principles	
11	Understanding of the global and societal impacts of engineering applications on health, the environment, and safety; awareness of national and international legal regulations, standards, and the legal implications of engineering solutions	5
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LECTURER(S)			
<b>Prepared by</b>	Prof. Dr. Hakan ÖZBAŞARAN		
<b>Signature(s)</b>			

**Date:** 27.01.2025