



COURSE INFORMATION FORM

Course Name	Course Code
EARTHQUAKE RESISTANT DESIGN OF STRUCTURES	151417450

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
	3	2		

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	-
Objectives of the Course	The purpose of this course is to introduce students to the behavior, analysis, and design rules of structures under earthquake effects.
Short Course Content	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.	8, 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, 8, 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

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

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

Calculation of Course Workload			
Activities	Number	Time (Hour)	Total Workload (Hour)
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
Total workload			137
Total workload / 30			4.57
Course ECTS Credit			5

Evaluation	
Activity Type	%
Mid-term	35
Quiz	
Homework	
Bir öge seçin.	
Bir öge seçin.	
Final Exam	65
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	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	3
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
12		

LECTURER(S)				
Prepared by	Assoc. Prof. Dr. Hakan ÖZBAŞARAN			
Signature(s)				

Date: 06.06.2024