

COURSE DESCRIPTION FORM	
<b>Course Code and Title</b>	CE486 STRUCTURAL DYNAMICS
<b>Semester</b>	8
<b>Catalog description</b>	Idealized models, Single Degree of Freedom Systems: Free Vibration, Harmonic Vibration, Response to Arbitrary, Step and Pulse Excitations, Numerical Evaluation of Dynamic Response, Earthquake Response of Linear Systems, Response Spectrum Method. Multi Degree of Freedom Systems: Modeling of Multi Degree of Freedom Systems, Free Vibration of Multi Degree of Freedom Systems, Forced Vibration of Multi Degree of Freedom Systems, Dynamic Analysis of Linear Systems, Earthquake Analysis of Linear Systems, Response Spectrum Analysis, Time History Analysis, Modal combination Rules.
<b>Required reading</b>	Chopra AK, Dynamics of Structures: Theory and Applications to Earthquake Engineering, Prentice Hall, Third Edition, New Jersey, 2007.
<b>Recommended reading</b>	-
<b>ECTS</b>	4
<b>Prerequisites and co-requisites</b>	No prerequisite Required attendance to lectures is at least 70%
<b>Compulsory/Elective</b>	Compulsory
<b>Language of instruction</b>	English
<b>Aim of course</b>	To give the basic principles of structural dynamics and information about the importance earthquake response analysis of structural systems.
<b>Learning outcomes of the course unit</b>	Learning the basic principles of structural dynamics and earthquake response analysis of structural systems. Learning the importance of structural dynamics and earthquake motion in civil engineering area. Learning the fundamental methods for analysis and design, in the civil engineering problems related to structural dynamics and earthquake motion.
<b>Mode of delivery</b>	The mode of delivery of this course is face to face.
<b>Course content</b>	<ol style="list-style-type: none"> <li>1. Introduction to dynamics of structures and Idealized models.</li> <li>2. Single Degree of Freedom Systems, Free Vibration.</li> <li>3. Harmonic Vibration, Response to Arbitrary, Step and Pulse Excitations.</li> <li>4. Numerical Evaluation of Dynamic Response.</li> <li>5. Earthquake Response of Linear Systems, Response Spectrum Method.</li> <li>6. Multi Degree of Freedom Systems, Modeling of Multi Degree of Freedom Systems.</li> <li>7. Midterm 1</li> <li>8. Free Vibration of Multi Degree of Freedom Systems.</li> <li>9. Modal Frequencies and Modes.</li> <li>10. Forced Vibration of Multi Degree of Freedom Systems.</li> </ol>

	11. Dynamic Analysis of Linear Systems.									
	12. Earthquake Analysis of Linear Systems.									
	13. Response Spectrum Analysis.									
	14. Midterm 2, Time History Analysis, Modal combination Rules.									
	15. Time History Analysis, Modal combination Rules.									
Planned learning activities and teaching methods	3 lecture hours per week (3+0) Web search and library work Quizzes Report preparation Midterm exam and required works Final exam and required works									
Assessment methods and criteria		Quantity		Percentage (%)						
	Mid-terms	2		55						
	Assignment	-		-						
	Exercises	-								
	Projects	-								
	Practice	-								
	Quiz	3		5						
	Contribution of In-term Studies to Overall Grade %			60						
	Contribution of Final Examination to Overall Grade (%)			40						
Attendance										
Workload	Efficiency		Total Week Count		Weekly Duration (in hour)		Total Workload in Semester			
	Theoretical Study Hours of Course Per Week		14		3		42			
	Practicing Hours of Course Per Week		14		0		0			
	Reading		14		1		14			
	Searching in Internet and Library		14		1		14			
	Designing and Applying Materials		14		0		0			
	Preparing Reports		14		0		0			
	Preparing Presentation		14		0		0			
	Presentation		14		0		0			
	Mid-Term and Studying for Mid-Term		2		10		20			
	Final and Studying for Final		1		15		15			
	Other		0		0		0			
	Total Workload:						105			
	Total Workload / 25:						4,2			
	ECTS:						4			
Course's contribution to program	No	Program Learning Outcomes				1	2	3	4	5
	1	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.								X

	2	Ability to identify, formulate, and solve complex civil engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.					X
	3	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.			X		
	4	Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in civil engineering practice; ability to employ information technologies and to use at least one computer programming language effectively.					
	5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex civil engineering problems or discipline specific research questions.					
	6	Ability to work efficiently in intra-disciplinary and multi-disciplinary teams.					
	7	Ability to work individually.			X		
	8	Ability to communicate effectively in Turkish, both orally and in writing; ability to write effective reports and comprehend written reports.			X		
	9	Knowledge of English of B1 level according to <u>Common European Framework of Reference</u> .					
	10	Prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.					
	11	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.		X			
	12	Consciousness to behave according to ethical principles and professional and ethical responsibility.			X		
	13	Knowledge on standards used in civil engineering practice.		X			
	14	Knowledge about business life practices such as project management, risk management, and change management.		X			
	15	Awareness in entrepreneurship, innovation; knowledge about sustainable development.					
	16	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.		X			
	17	Awareness of the legal consequences of engineering solutions.					
<b>Name of lecturer(s) and contact information</b>		Prof. Dr. Kurtuluş SOYLUK, <a href="mailto:ksoyluk@gazi.edu.tr">ksoyluk@gazi.edu.tr</a>					