



Izmir Yüksek Teknoloji Enstitüsü
İnşaat Mühendisliği Bölümü

CE 423 Introduction to Structural Dynamics
Fall 2024 - 2025

Instructor

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Course Summary

The course involves the assembly of dynamic equilibrium equations, the response of single and multi degree of freedom systems under harmonic, periodic and general dynamic loading, modal analysis, and Earthquake response of structures. Wooden structural models will be created in the laboratory to better understand the important concepts of structural dynamics. Furthermore, the structural acceleration responses will be measured by using the students cell phones.

Course Topics

- computer simulation of equation of motion
- dynamic equilibrium equations
- structural response due to step loads
- damped structural response due to step loads
- structural response due to harmonic loads
- tuned mass damper (TMD) design
- structural response due to general loads
- structural response due to earthquake loads
- base isolator design
- modal analysis of MDOF structures

Evaluation

Assignments	30%
Midterm Examination	30%
Final Examination	40%

References

- K. Chopra, Dynamics of Structures
- Vedat Yerlici, Hilmi Luş, Yapı Dinamiğine Giriş, 2007, Mart Matbacılık Sanatları, ISBN975-6193-68-6



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Letter Grade and Explanation (adopted from www.houghton.edu)

Assignment Category	AA	BB	CC	DD	FF
Problem Sets and Tests	Understands and utilizes correct physical principles and appropriate mathematical tools to correctly solve problems or answer questions.	Typically understands and uses correct physical principles and appropriate mathematical tools, but makes significant errors	Displays a basic understanding of the material, but often confuses physical principles, misuses equations, or fails to perform the required mathematical steps.	Typically does not correctly apply physical principles or mathematical tools.	Does not apply appropriate principles or mathematical tools in a meaningful way.
Labs	Correctly performs, analyzes, and discusses the given experiments with clear skill and understanding.	Performs, analyzes, and discusses the given experiments with some skill and understanding, but does not completely troubleshoot problems or understand results.	Partially performs, analyzes, and discusses the given experiments, but does little troubleshooting or analysis.	Does not correctly perform, analyze, and discuss most of the experiment.	Does not perform or analyze the experiment.
Research	Recognizes and clearly defines problems and is able to propose/implement multiple solutions. Displays true craftsmanship, creativity, and skill.	Usually identifies at least one possible solution. Displays some evidence of skill.	Identifies problems, but rarely develops successful solutions. Does not adequately carry out given task.	Does not typically identify problems or offer solutions. Does not carry out given task.	Does not carry out given task.
Communication	Clearly states background, significance, methodology, results, and discussion using appropriate language and figures in a polished work.	States background, significance, methodology, results, and discussion using mostly appropriate language and figures.	Does not sufficiently state background, significance, methodology, results, and discussion. Language and/or figures need significant improvement.	Much of background, significance, methodology, results, or discussion is missing, unclear, or incorrect. Inappropriate language and/or figures.	Little or no reasonable explanations are given. Little or no appropriate language or figures used.