

Construction & Building Engineering Courses (CB)

Structural Analysis & Metallic Structures Courses Group

CB 545 – Structural Dynamics

COURSE INFORMATION

Course Title: Structural Dynamics

Code: CB 545

Hours: Lecture – 2 Hrs. Tutorial – 2 Hrs. Credit –3.

Prerequisite: CB 343

GRADING

Class Performance/Attendance: 10%

Midterm # 1/Assignments – (7th Week): 30%

Midterm # 2/Assignments – (12th Week): 20%

Final Exam: 40%

COURSE DESCRIPTION

Structural vibrations, Earthquake response of structures, Design criteria for seismic resistant structures, Seismic response of tall buildings, Response spectra.

TEXT BOOK

Dynamics of Structures by CHOPRA, ANIL K., Publisher: Theory and Applications to Earthquake Engineering, Prentice-Hall, Englewood Cliffs, USA.

REFERENCE BOOKS

Structural Dynamics: Theory and Computation by PAZ, M Publisher: Van Nostrand Reinhold Company, New York, 2nd Edition 1985.

Probabilistic Theory of Structural Dynamics by LIN, Y Publisher: McGraw-Hill Inc., 1967.

COURSE AIM

The course introduces the students to the basic concepts of structural vibrations and its applications in building structures.

APPENDIX A-162

SPECIFIC OUTCOMES OF INSTRUCTION

- The student should be familiar with the concepts and theories of the analysis and design of structures subjected to dynamic loading.
- The student should know the basic concepts of structural vibrations and its applications in building structures.

COURSE OUTLINE

<i>Week Number 1:</i>	Introduction to Structural Dynamics.
<i>Week Number 2:</i>	Equations of motion, Problem statement.
<i>Week Number 3:</i>	Solution methods for the calculation of the dynamic response of structures.
<i>Week Number 4:</i>	Undamped free vibration of single-degree of freedom systems.
<i>Week Number 5:</i>	Damping of structures.
<i>Week Number 6:</i>	Damped free vibration of single degree of freedom systems.
<i>Week Number 7:</i>	Response to harmonic and periodic excitations & 7th week examination.
<i>Week Number 8:</i>	Inelastic systems.
<i>Week Number 9:</i>	Earthquake response of structures.
<i>Week Number 10:</i>	Earthquake Engineering & Cause of earthquakes.
<i>Week Number 11:</i>	Design criteria of seismic resistant structures.
<i>Week Number 12:</i>	Codes of practice for the design of earthquake resistant structures & 12th week examination.
<i>Week Number 13:</i>	Dynamic analysis of tall buildings.
<i>Week Number 14:</i>	Seismic response of tall buildings.
<i>Week Number 15:</i>	Response spectra.
<i>Week Number 16:</i>	Final Exam.

COURSE COORDINATOR AND DEMAND

Course Coordinator: Dr. Mostafa Khalifa.

Course Demand: *Elective*