Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE4640 - Analysis and Design for wind and earthquake effects

Credit Distribution: C:9 L:3 T:0 P:0 E:0 O:6 TH:0

Course Type: Theory

Description: To enable understanding of the concepts and issues in analysis, design and detailing of structures, to resist wind and earthquake effects.

Course Content:

Wind Effects: Nature of wind loads, Characteristics of windstorms, Design wind speeds and risk coefficients, design wind pressure and pressure coefficients, gust factors.

Earthquake Effects: Earthquake ground motions; Analysis of structures: equivalent static analysis, response, and design spectra; Ductility and energy dissipation capacity; Response reduction factor; Capacity design and detailing of reinforced concrete and steel members, joints, connections and building frames.

Textbooks

- Chopra, A.K., Dynamics of Structures: Theory and Applications to Earthquake Engineering, Prentice Hall, 2001.

Reference Books

- IS 800, IS 875, IS 1893, IS 4326, IS 13920, Bureau of Indian Standards.
- Taranath, B.S., Wind and Earthquake Resistant Buildings, CRC Press, 2005.
- Duggal, S. K., Earthquake Resistant Design of Structures, Oxford University Press, 2007.
- Agarwal, P. and Shrikhande, M., Earthquake Resistant Design of Structures, PHI Learning Pvt. Ltd., 2006.
- Holmes, J.D., Wind Loading on Structures, 2nd Ed., Taylor & Francis, 2007.
- The Seismic Design Handbook, 2nd Ed., Edited by Naeim, F., Springer (India) Pvt. Ltd., 2001.
- Paulay, T., and Priestley, MJN., Seismic Design of Reinforced Concrete and Masonry Buildings, John Wiley & Sons, Inc., 1992.

Prerequisite: NIL