

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE6320 – Engg. Seismology and Hazard Assessment

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

Course Type: Theory

Description: To gain a thorough understanding of engineering seismology, strong ground motion and hazard assessment - To provide a background for the assessment of design-basis ground motion, both in frequency and time domain.

Course Content: 1. Introduction: Seismic and structural geology, Sources of earthquakes, Seismic instrumentation, Stability and Flexure of tectonic plates. 2. Seismic Wave Propagation: Computational aspects. 3. Earthquake Source Mechanics: Seismotectonics, Elastodynamics, Fault rupture mechanics, Fault plane solutions (PC based) and source parameters. 4. Earthquake Catalogs and Recurrence Models: Analysis of previous earthquakes. 5. Engineering Seismology and Strong Ground Motion: Computational aspects. Probabilistic Seismic Hazard Assessment (PSHA), Numerical Analysis, Seismic hazard maps for India.

Text Books

- Kramer, S.L., Geotechnical Earthquake Engineering, Pearson, 2003.
- Stein, S. and Wysession, M., An Introduction to Seismology, Earthquakes and Earth Structure, Blackwell Publishing, 2003.
- Shearer, P.M., Introduction to Seismology, 2nd Ed., Cambridge University Press, 2009.
- Turcotte, D.L. and Schubert, G., Geodynamics, 3rd Ed., Cambridge University Press, 2014.
- AKi, K. and Richards, P.G., Quantitative Seismology, 2nd Ed., University Science Books, 2002.
- Development of Probabilistic Seismic Hazard Map of India, National Disaster Management Authority report.

Reference Books: NIL

Prerequisite: NIL