CE227 Jan 3:0

Engineering Seismology

Instructor

P. Anbazhagan
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Teaching Assistant

Nil
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Department: Civil Engineering

Course Time: Mon, Wed and Frid 12-13.00

Lecture venue: GTLH

Detailed Course Page: http://nptel.ac.in/syllabus/105108076/

Announcements

Brief description of the course

The main objective of this course is to introduce the basic knowledge on earthquake engineering.

The course covers the source mechanics of earthquake, hazards and its consequences and also covers earthquake measurement and instrumentation.

A student interested in Earthquake or design against of earthquake and interested in Earthquake related research

Prerequisites

B.E with Basic Mathematical and Geo-Mechanics

Syllabus

Introduction to earthquake hazards. Strong ground motions, tsunamis, landslides, liquefaction. Overview of plate tectonics and earthquake source mechanisms. Theory of Wave propagation. Body waves and surface waves. Concepts of seismic magnitudes and intensity. Seismic station. Sensors and data loggers, mechanical

and digital sensors. Interpretation of seismic records â€“ acceleration, velocity and displacement. Regional seismicity and earthquakes in India. Seismic zonation â€“ scales, macro and micro, attenuation, recurrence relation. Seismic hazard analysis -deterministic and probabilistic. Site characterizationâ€“Different methods and experiments. Local site effects ground motion amplifications. Development of response/design spectrum. Liquefaction hazard assessments. Integration of hazards using GIS. Risk and vulnerability Studies.

Course outcomes

Understanding all facts of earthquake hazards, will be able to quantify different earthquake hazards and its effects (e.g. site effects, liquefaction, landslides etc) using different methods, which facilitate in planning new structures/project and retrofit old buildings and infrastructures.

Grading policy

20 % for Assignments and Projects, 30 % mid term and 50 % Final

Assignments

Resources

http://nptel.ac.in/courses/105108076/

Earthquake Engineering - From Engineering Seismology to Performance - Based Engineering Edited by Bozorgnia, Y. and Bertero, V.V., CRC Press Washington 2004.

Earthquake hazard Analysis - Issues and Insights by Leon Reiter, Columbia University Press New York 1990.

Instrumentation in Earthquake Seismology by Havskov, J. and Alguacil, G. Springer, Netherlands, 2004.

Geotechnical Earthquake Engineering by Steven L Kramer, Pearson Education, 2003.