

Geotechnical Earthquake Engineering - Web course

COURSE OUTLINE

This course provides basic concepts of earthquakes and dynamic properties of soils and the response of soils to earthquake loads.

The course also deals with various earthquake hazards including liquefaction, procedures to evaluate them and methods of mitigation.

The syllabus covers subject content that is expected to be useful for students from several disciplines including civil engineering, seismology and earthquake engineering.

COURSE DETAIL

Class	Topic	No. of hours
1	Introduction to Geotechnical Earthquake Engineering.	1
2	Engineering Seismology & Plate Tectonics.	1
3	Types of faults and Plate Boundaries.	1
4	Seismic waves.	1
5	Earthquake Hazards.	1
6	Size of Earthquakes.	1
7	Strong Ground Motion.	1
8	Ground Motion Parameters.	1
9	Estimation of Ground Motion Parameters.	1
10	Seismic Hazard Analysis.	1
11	Deterministic Seismic Hazard Analysis.	1



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Civil Engineering

Pre-requisites:

1. Soil Mechanics, Soil Dynamics.

Coordinators:

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12	Concepts of Probabilistic Seismic Hazard Analysis.	1
13	Probabilistic Seismic Hazard Analysis.	1
14	Wave Propagation.	1
15	Dynamic Soil Properties.	1
16	Evaluation of Dynamic Soil Properties by Field tests.	2
17	Evaluation of Dynamic Soil Properties by Laboratory tests.	2
18	Stress-Strain behavior of cyclically loaded soils.	1
19	Introduction to Liquefaction.	1
20	Concepts of Liquefaction.	1
21	Initiation of liquefaction.	1
22	Evaluation of Liquefaction.	2
23	Liquefaction Hazards.	1
24	Post liquefaction strength of soils.	1
25	Ground Response Analysis.	2
26	Soil-structure interaction.	1
27	Local site effects.	1
28	Seismic Slope Stability.	2
29	Seismic Design of Earth Retaining Walls.	2
30	Seismic Bearing Capacity of foundations.	1
31	Seismic microzonation of India.	1
32	Standards for earthquake resistant design.	1

33	Mitigation of effects of earthquake.	1
34	Ground improvement for mitigating earthquake hazards.	1
35	Numerical modeling in earthquake geotechnical engineering.	1

References:

1. Geotechnical Earthquake Engineering By Steven L. Kramer, Pearson Education, 2003.
2. Geotechnical Earthquake Engineering Handbook By Robert W. Day, McGraw-Hill 2002.