

6CE05 : (III) INTRODUCTION TO EARTHQUAKE ENGINEERING

Learning Objectives of Subject:

This course will cover the basics of seismology and Earthquake engineering. Students will learn

1. Basic seismology, earthquake phenomenon and its characteristic.
2. Earthquake resistant concept.
3. Use of earthquake bands in masonry structure.
4. Behavior of buildings during earthquakes.

Course outcomes:

At the end of the subject the students will be able to -

1. Identify type of earthquake, its properties
2. Earthquake resistance planning
3. Apply knowledge of seismic bands in masonry structure construction
4. Solve engineering problems in the context of Earthquake Engineering.

SECTION A

Unit I: Interior of earth, engineering geology of earthquakes, plate tectonics, Seismicity of the world, tectonics features of India, Faults, and Propagation of earthquake waves.

Unit II: Quantification of earthquake (magnitude, energy, intensity of earthquake), Measurements of earthquake (accelerograph, accelerogram recording), Determination of magnitude, Epicenter distance, Ground motion and their characteristics, Factors affecting ground motions.

Unit III: Guidelines for achieving efficient seismic resistant planning, selection of sites, importance of architectural features in earthquake resistant buildings.

SECTION B

Unit IV: Projections & suspended parts, special construction features like separation of adjoining structure, crumble section, stair case etc., twisting of building, seismic effects on structures, inertia forces, horizontal & vertical shaking.

Unit V: Behavior of masonry structure during earthquake, bands & reinforcement in masonry building opening in walls, importance of flexible structures.

Unit VI: Behavior of R.C. building in past earthquakes. Concept of earthquake Resistant design, Introduction to IS: 1893.

Books Recommended:

1. Duggal S. K., Earthquake Resistant Design of Structures, Oxford University Press 2007
2. Amita Sinvhal; Understanding Earthquake Disasters, Tata McGraw Hill
3. P. N. Agrawal; Engineering Seismology Oxford & IBH Publishing
4. C.V.R. Murty; Earthquake Tips National Information Centre of Earthquake Engineering IIT Kanpur
5. Pankaj Agrawal & Manish Shrikhande ; Earthquake Resistant Design of Structures Prentice- Hall of India