

## **PCI6D002 EARTHQUAKE ENGINEERING (HONOR) (4-0-0)**

### **Module I**

Elements of Earthquake origin & Propagation: Elements of Seismology, Earthquakes, Structure of the Earth, History of the Earth, Earthquake Mechanism, Propagation of Seismic Waves, Earthquake Phenomena, Earthquake Measurements, Definitions of magnitude, intensity, epicenter etc; Plate tectonics, seismographs, liquefaction, Types, effects and controlling factors

### **Module II**

Theory of Vibration Effects: Dynamic Loads. D'Alembert's Principle and inertia forces, Stiffness and flexibility of elastic structures, Theory of Vibrations, Free vibrations of single and multiple degree freedom systems, computations of dynamic response to time dependent forces, mass and stiffness matrices, natural frequencies, Plate Tectonics Theory.

### **Module III**

Earthquake Resistant Design: Principles of Earthquake Resistant Design, Response spectrum theory. Time - Acceleration method, Application of response spectrum theory to seismic design of structures.

### **Module IV**

Earthquake Damages: Earthquake Damages to Various Civil Engineering Structures, Case Histories Earthquake, Earthquake response of structures, Soft storey collapse, Slender structures, unsymmetrical structures

Methods of disaster prevention: Earthquake resistant building Regulations, specification, guidelines for construction - Materials selection.

### **Reference Books**

1. A K. Chopra (2003), Dynamics of Structures-Theory and Applications to Earthquake Engineering, Second Edition, Printice-Hall India Pvt Ltd.
2. Pauley & Priestly (1995), Seismic design of reinforced concrete and masonry buildings, John Wiley & Sons.
3. Stratta.J.L. (2000), Manual of Seismic Design, Prentice-Hall India Pvt Ltd.
4. Kramer.S.L. (2000), Geotechnical Earthquake Engineering, Prentice-Hall India Pvt Ltd.
5. Agarwal & Shrinkhardo (2006), Earthquake Resistant design of a structures, Prentice-Hall India.
6. Earthquake Resistant Design of Structures, S.K.Duggal, Oxford University Press