

# Higher Institute of Earthquake studies and Research

**Department: Earthquake Structural Engineering**

**Course: principals of Seismology and Earthquake Engineering (Part 2)**

**Hours: (2 Hours Theoretical+2hours Practical) weekly**

**Teaching Staff:**

**Description:**

The course is 8 chapters. It starts by the elementary principals of Historical Development of Seismic Codes, then Seismic Load Analysis Procedures, and the seismic isolation Passive Control Devices for isolation. Base Isolator Devices and Systems, and buildings, The Code Provisions for Seismic Isolation & Seismic Hazard Level& Design methods. The last chapter discusses the topics of the response spectrum.

**Aims & Objectives:**

The purpose of this course is to present the essential theoretical background of the earthquake engineering in the strong ground motions and the seismic isolation Passive Control Devices for isolation.

**Syllabus:**

Chapter 1: The Introduction Principles & Historical Development of Seismic Codes

Chapter 2: The Seismic Load Analysis Procedures

Chapter 3: The seismic isolation as Passive and active Control Devices for isolation

Chapter 4: Base Isolator Devices and Systems

Chapter 5: The Code Provisions for Seismic Isolation & Seismic Hazard Level& Design methods

Chapter 6: Ground Motion Characteristics &dynamic analysis under seismic load &example (MDOF)

Chapter 7: The response spectrum

Chapter 8: The Concepts of Dynamic Response Analysis

**Course Outline:**

Week 1: Introduction Principles& Historical Development of Seismic Codes (UBC97 code & NEHRP Provisions

Week 2: Introduction Principles& Historical Development of Seismic Codes (IBC code new &Syrian code & ASCE 7-05 Seismic Provisions code)

Week 3: Seismic Load Analysis Procedures (Equivalent Lateral Force (ELF)& Modal Analysis)

Week 4: Seismic Load Analysis Procedures (Site Specific Response Spectrum &Dynamic analysis procedure)

Week 5: examples

Week 6: seismic isolation Passive Control Devices for isolation & Semi Active Control

Week 7: Base Isolator Devices and Systems

Week 8: Code Provisions for Seismic Isolation & Seismic Hazard Level& Design methods

Week 9: Design & Testing Requirements for Isolator

Week 10: Ground Motion Characteristics

Week 11: dynamic analysis under seismic load &example (MDOF)

Week 12: response spectrum

Week 13: design response-spectra& example

Week 14: Concepts of Dynamic Response Analysis (SDOF and MDOF systems, Natural Period, Damping,

Week 15: Smoothed Design Spectra & revision

**Instructional Methodology & Teaching Resources:**

Lectures, examples, applications

**Head of Department:**

Date:

**Vice Dean:**

Date:

**Dean:**

Date: