Higher Institute of Earthquake studies and Research

Department: Earthquake Structural Engineering
Course: Seismic Design of R.C Structures
Contact Hours: (2 Hours Theoritical+2hours Practical) Weekly
Teaching Staff:

Description:

Reinforced Concrete Design course covers various aspects of seismic design of reinforced concrete structures with an emphasis on design for regions of high seismicity, using ACI 318 ultimate strength methods; design of beams, and columns. Because the requirement for greater ductility in earthquake-resistant buildings represents the principal departure from the conventional design for gravity and wind loading, the major part of the discussion in this course will be devoted to considerations associated with providing ductility in members and structures. The concepts of seismic demand and capacity are introduced and elaborated on. Specific provisions for design of seismic resistant reinforced concrete members and systems are presented in detail. Appropriate seismic detailing considerations are discussed. Finally, a numerical examples is presented where these principles are applied.

Aims & Objectives:

- To have students learn behavior and design of reinforced concrete members and structures, enough to be immediately useful in design of reinforced concrete beams, walls, and columns using ACI-318. The ultimate strength design method will be covered.
- Analyze design and detailing different reinforced concrete elements
- Understand the applicability of strut and tie models for disturbed regions

Syllabus:

Chapter 1: Probabilistic methods for estimating the loads earthquakes

chapter 2: The equivalent static lateral second side according to the new Syrian code& ACI 318-014

Chapter 3: The Dynamic analysis using the response spectra method

Chapter 4: the types of R.C structures resistance to lateral forces(SRMF + MRMF+ Special R.c shear walls)

Chapter 5: Beam Transverse Reinforcement, Beam Shear Strength, Example

Chapter 6: Beam-Column Joint examples

Chapter 7: Column slenderness, columns non-sway or sway Column, examples

Chapter 8 Overview of Walls, General Requirements, Design of Shear Wall Coupling Beams, Wall Example

Chapter 9: The design criteria and allowable bearing pressure, Determine footing size, Check resistance to sliding

Chapter 10: Truss model for Design of R.C. Beams Shear

Chapter 11: Reinforced concrete deep beam

Chapter 12: strut-and-tie design provisions recommended by (ACI 318-14)

Chapter 13: deep beam as strut-and-tie- example

Chapter 14: revision

Course Outline:

Week 1: Probabilistic methods for estimating the loads earthquakes

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Week 11: Reinforced concrete deep beam
Week 12: strut-and-tie design provisions recommended by (ACI 318-14)
Week 13:deep beam as strut-and-tie
Week 14: example
Week 15: revision

Instructional Methodology & Teaching Resources:

Lectures, examples, applications, presentation

Head of Department: Date:

Vice Dean: Date:

Dean: Date: