# structedu
## Exploring Potential

**ETABS** (Advanced)

## CURRICULUM

**1. INTRODUCTION**

**2. TYPES OF DYNAMIC ANALYSIS**

**3. DYNAMIC ANALYSIS BY RESPONSE SPECTRUM METHOD**

> **3.1** How to Perform Dynamic Analysis in ETABS?

>> **3.1.1** Definition of Response Spectrum Function

>> **3.1.2** Definition of Modal Cases

>>> **3.1.2.1** Maximum number of modes to be considered in a given building.

>> **3.1.3** Definition of Spectrum Load Cases

> **3.2** Modes of Oscillations

>> **3.2.1** Translational mode of oscillation

>> **3.2.2** Torsional Mode of Oscillation

> **3.3** Modal Participation Mass Ratios

> **3.4** Scaling up the Base Shear

>> **3.4.1** Why do we scale up the Base Shear?

**4. CHECKS TO MAINTAIN THE STABILITY OF THE BUILDING**

> **4.1** Torsional Irregularities

> **4.2** Re-entrant Corners

> **4.3** Excessive Cutouts/Openings

> **4.4** Non-Parallel Lateral Force System

> **4.5** Stiffness Irregularity (Soft Story)

> **4.6** Mass Irregularity

> **4.7** Vertical Geometric Irregularity

> **4.8** In-Plane Discontinuity

> **4.9** Floating/Stub Columns

> **4.10** Irregular Modes of Oscillations

**5. LOAD COMBINATIONS FOR DYNAMIC ANALYSIS**

## 6. COLLATERAL CONCEPTS

**6.1** Non Orthogonal Frames

**6.1.1** Load Combinations for buildings with Non Orthogonal Frames

**6.2** Vertical Earthquake Effects

**6.2.1** When to consider vertical earthquake effects in a given building?

**6.2.2** Definition of Response Spectrum Function & Case for Vertical Shaking

**6.2.3** Scale factor for Vertical Spectrum Load Case

**6.2.4** Load Combinations for buildings when we consider vertical earthquake effects

**6.3** Expansion Joint

**6.3.1** When to provide an Expansion Joint?

**6.3.2** How to decide the gap between the two buildings in the expansion joint

## 7. TALL BUILDINGS

**7.1** Introduction to Tall Buildings

**7.1.1** Etabs model preparation for a tall building

**7.2** Different Type of Structural Systems used in Tall Buildings

**7.3** Stability Checks for Tall Buildings

**7.2.1** Lateral Deflection Checks for Wind

**7.2.2** Lateral Deflection Checks for Seismic loads

**7.2.3** Lateral Drift Check

**7.2.4** Soft Story Check

**7.2.5** Weak Story Check

**7.2.6** Natural Modes of Vibration

**7.3** Design Criteria checks for Beams, Columns & Shear Walls

## 8. DETAILING OF STRUCTURAL ELEMENTS

**8.1** Ordinary Detailing

**8.1.1** When shall we perform ordinary detailing to structural elements?

**8.1.2** Detailing of Beams

**8.1.3** Detailing of Columns/Shear Walls

**8.1.4** Detailing of Slabs

**8.2** Ductile Detailing

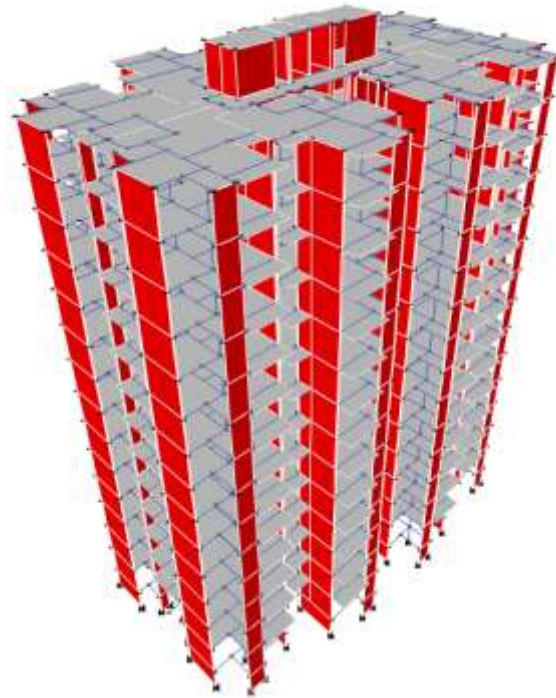**8.2.1** When shall we perform ductile detailing to structural elements?

**8.2.2** Detailing of Beams

**8.2.3** Detailing of Columns/Shear Walls

**8.2.4** Detailing of Slabs

## 9. ASSIGNMENTS

**10. TESTS**



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**TAKE AWAY OF THE COURSE**

Complete Understanding on Structural Design of Buildings (High Rise)

Complete understanding on Earthquake Concepts

Hands on Experience on the Earthquake Resistant Design of Buildings (Super Structure)

Exposure on Bureau of Indian Standard Codes like
IS 1893 Part 1 2016
IS 456 2000
IS 13920 2016
IS 16700 2017
SP 16
IS 875 PART I
IS 875 PART II
IS 875 PART III
Complete understanding on ETABS Software