

**SHIV NADAR UNIVERSITY**  
**UNDERGRADUATE COURSE PROPOSAL**

**I. COURSE TITLE:** BASIC REINFORCED CONCRETE DESIGN

**II. COURSE CODE (PLEASE CROSS-LIST IF APPLICABLE):** CED305

**III. COURSE CREDITS (L:T:P):** 3

**IV. TOTAL CONTACT HOURS/ BATCH/WEEK (L:T:P):** (3:0:0)

**V. NO. OF BATCHES:** 1

**VI. COURSE TYPE (MAJOR/UWE/CCC/REAL/VELS/IC), PLEASE MENTION ALL THAT APPLIES & WRITE CREDITS FOR EACH ONE:** MAJOR

**VII. PREREQUISITE/S (IF ANY):** ENGINEERING MECHANICS, STRUCTURAL ANALYSIS AND CONCRETE DESIGN

**VIII. COURSE COORDINATOR/INSTRUCTOR(S):** DR. SUMEDHA MOHARANA

**IX. SCHOOL/ DEPARTMENT:** DEPARTMENT OF CIVIL ENGINEERING

**X. DISCIPLINES TO WHICH THE COURSE MAY BE OF INTEREST:**

CIVIL ENGINEERING

**XI. Course Objective :**

This course aims to train the students the design of basic structural elements governed by bending, shear, axial forces or combination and are considered as building blocks of the whole structure. The design will be done as per IS 456:2000.

**XII. Learning Outcomes**

- To give an experience in the implementation of designing concepts (WSM/LSM) which are applied in field of structural engineering
  - To involve the application of scientific and technological principles of design of buildings according to limit state method of design
  - To present the foundations of many basic engineering concepts related designing of structures
- To understand the various design concepts and analyze and design structural elements such

## **XI. COURSE CONTENT:**

### **1. Module-I**

Introduction to RC structure, Constituents of concrete mix, Grade of concrete, Behavior of hardened concrete under uniaxial compression, tension, and combined stresses, Creep, shrinkage and temperature effects, Durability, Properties of reinforcing steel

### **2. Module-II**

Design philosophy, Working stress method and Limit states method

### **3. Module-III**

Limit State Method - Analysis at ultimate loads of singly and doubly reinforced rectangular and flanged sections, Design of beams, Design for bond: Development length, Splicing, Curtailment, Code requirements and Deflection control, one-way & two-way rectangular slabs

### **4. Module-IV**

Design for Shear and Torsion, Design for shear with shear reinforcement and Design for torsion with shear reinforcement

### **5. Module-V**

Design of compression member, Effective length, Short column under axial compression with and without uniaxial/biaxial moment, Design of slender Slender columns, Design of staircase and column footing

## **XIII. ASSESSMENT SCHEME:**

### **Evaluation Scheme:**

Minor Exam: 10%

Quizzes: 10%

Assignments: 20%

Detailing and class participation: 10%

Major Exam: 50%

**Passing Mark: 40**

## **BOOKS**

- Design of Reinforced Concrete Structures (IS:456-2000) 3 Edition, N. Krishna Raju, CBS Publisher (2013)
- Reinforced Concrete Design 3 Edition, S. Pillai, Devdas Menon, Tata Mcgraw Hill Education Private Limited (2011)
- Limit State Design of Reinforced Concrete 2 Edition, P. C. Varghese, Phi Learning

## **IS Codes**

- IS 456 : 2000 Indian Standard PLAIN AND REINFORCED CONCRETE, BIS, New Delhi
- SP 16 : 1980 Design Aids for Reinforced Concrete to IS 456 : 1978, BIS, New Delhi

- SP 24 (S and T) : 1983 Explanatory Handbook on Indian Standard Code of Practice for Plain and Reinforced Concrete, BIS, New Delhi
- IS 875- Part-1 to Part-5