

# AMCE11 DESIGN OF R.C STRUCTURES

## UNIT-1 DESIGN PHILOSOPHIES

- 1.1 Introduction, Working Stress Method, Ultimate Load Method, Limit State Method,
- 1.2 Limit State Method Vs Working Stress Method, Building Code,
- 1.3 Accuracy Of Computations, Type Of Construction

## UNIT-2 SINGLY REINFORCED STRUCTURE

- 2.1 Bending Of Beams, Cracked Concrete Stage, Ultimate Strength Stage, Assumptions,
- 2.2 Moment Of Resistance, Modes Of Failure,
- 2.3 Minimum And Maximum Tension Reinforcement, Effective Span

## UNIT-3 DOUBLY REINFORCED SECTIONS

- 3.1 Types Of Problem, Stress In Compression Reinforcement, Design Steps,
- 3.2 Minimum And Maximum Reinforcement, Design Tables, Flanged Beams,
- 3.3 Effective Width Of Flange

## UNIT-4 SHEAR AND DEVELOPMENT LENGTH

- 4.4 Shear Stress, Diagonal Tension, Shear Reinforcement, Spacing Of Shear Reinforcement,
- 4.5 Development Length, Anchorage Bond, Flexural Bond

## UNIT-5 TORSION

- 5.1 Introduction, torsional stiffness of homogeneous sections, torsional stiffness of R.C. Sections,
- 5.2 Torsional reinforcement, distribution of torsion reinforcement, torsion in beams curved in plan

## UNIT-6 TYPES OF FLOOR

- 6.1 One-Way Slab Systems, Two-Way Slab Systems, Flat Slab Systems, Flat Plate Systems, Grids.

## UNIT-7 COLUMNS AND WALLS

- 7.1 Effective height of a column, assumptions, minimum eccentricity, short column under axial compression, requirements for reinforcement, columns with helical reinforcement,
- 7.2 Short columns under axial load and uniaxial bending, construction of design charts, short columns under axial load and biaxial bending, slender columns,
- 7.3 Walls, construction of design charts, reinforcement in walls, corbels, truss analogy, detailing of reinforcement.
- 7.4 RETAINING OF WALLS, forces on retaining walls, stability requirements, proportioning of cantilever walls, development length, loads on the heel, rear counterforts,

## UNIT-8 TYPES OF STAIRS

- 8.1 Common types of stairs, central-wall type stairs, central-column type stairs, slab less stairs, helicoidally stairs, free-standing stairs

## UNIT-9 DESIGN OF TANKS

- 9.1 Roofs, ring beam, floors, walls of rectangular tanks, walls of circular tanks, shear force,  
9.2 Steel ladder, base slab, cover to reinforcement , joints, design and detailing of joints, spacing of joints ,

### **UNIT-10 MASONRY BUILDINGS**

- 10.1 Introduction, Brick Wall Design Under Vertical Loads

### **UNIT-11 FOUNDATIONS**

- 10.1 Introduction, minimum foundation depth., shallow foundations, use of plinth beams,  
10.2 Brick wall design under horizontal loads, resistance to earthquake forces by wall boxed in plan, deep foundations

#### **Reference books:**

1. Design of Reinforced Concrete Structures by P Dayaratnam
2. Advanced Reinforced Concrete Design by P C Varghese

