

REINFORCED CONCRETE STRUCTURES-II

Course Code: 13CE1143

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Course Educational Objectives :

- ❖ To impart concepts of design of reinforced concrete structures such as staircase, retaining walls and water tanks.
- ❖ To familiarize the students with the knowledge of detailing of reinforcement.
- ❖ To equip the student with the design of combined footing and pile foundation.

Course Outcomes:

- ❖ The students will be able to design structures such as staircase, foundations, retaining walls and water tanks.
- ❖ The student should be capable of understanding of structural drawings for practical execution of structures.

UNIT-I

(10 Lectures)

STAIRCASES: Introduction, types - design of Dog-legged staircase- design of open well staircase with quarter span landing- design of stairs with central stringer beam.

UNIT-II

(14 Lectures)

COMBINED FOOTINGS:

Introduction – Design of combined rectangular footings –combined trapezoidal footings – MAT foundation – Reinforcement detailing and bar bending schedule.

STRUCTURAL DESIGN OF PILE FOUNDATIONS :

Types of piles – Load carrying capacity of piles – Group action in piles – Structural design of RC piles – Design of pile cap for 2 or 3 piles - Reinforcement detailing and bar bending schedule.

UNIT-III**(14 Lectures)****CANTILEVER RETAINING WALLS :**

Introduction – Types of retaining walls – Active and passive earth pressure – Design principles of cantilever retaining walls with horizontal back fill – With horizontal back fill and traffic load – With sloping back fill.

COUNTERFORT RETAINING WALLS:

Design principles of Counterfort retaining walls with horizontal back fill – With horizontal back fill and traffic load – With sloping back fill – Reinforcement detailing and bar bending schedule.

UNIT-IV**(12 Lectures)****RECTANGULAR WATER TANKS-I:**

Introduction – General design requirements according to Indian standard code of practice – Design of on ground and underground water tanks – Reinforcement detailing and bar bending schedule.

RECTANGULAR WATER TANKS-II:

Introduction – General design requirements according to Indian standard code of practice – Design of over head water tanks – Reinforcement detailing and bar bending schedule.

UNIT-V**(10 Lectures)****CIRCULAR WATER TANKS :**

Introduction – General design requirements according to Indian standard code of practice – Joints in water tanks – Circular tank with flexible joint between floor and wall – Circular tank with rigid joint between floor and wall – Design of Over head tanks - IS code method for design of circular tanks – Reinforcement detailing and bar bending schedule need to be prepared.

TEXT BOOKS

1. Punmia B.C., Ashok kumar Jain & Aurn Kumar Jain, “*Reinforced concrete structures*”, volume – I, 5th Edition, Laxmi publications Pvt. Ltd., New Delhi, 2008.
2. Varghese P.C., “*Limit State Design of Reinforced Concrete Structures*”, 3rd Edition, Prentice hall of India, New Delhi, 2005.

REFERENCES

1. Varghese P.C., “*Advanced Reinforced Concrete Structures*”, 4th edition, Prentice hall of India, 2005.
2. Pillai S.V. and Menon D, “*Reinforced Concrete Design*”, 2nd edition, Tata Mc Graw Hill, 2006.
3. Krishna Raju N, “*Advanced Reinforced Concrete Design*”, 4th edition, University Press, 2007.
4. Codes: Relevant IS codes.

