CE 301: Reinforce Concrete Design   (3- 1- 0:4)

Course Objectives: Objective of the course are to study the stress strain behavior of steel and concrete; to understand the concept of working stress and limit state methods; to gain the knowledge of limit state design for flexure, shear, torsion, bond and anchorage; to understand the behavior of columns subjected to eccentric load and use of interaction diagrams; to study the design of various foundation types

_____

Design methods
Working stress and limit state method of design of R.C. Structures

Design of Beam
Singly reinforced, Doubly reinforced beam, Flanged beam, Shear and bond, development length, detailing of reinforcement, Torsion, Serviceability criteria: Deflection

Design of Slab:
One way and two way slab, detailing, redistribution of moments

Design of Column
Axial loading, Uniaxial bending, Biaxial bending, Slender column

Design of foundation
Isolated and Combined footing.

Design of staircase
Design of simple stair case - Dog legged stair case

Relevant is code
All the design will be as per the relevant IS code, Seismic coefficient method,(IS:456, IS:875, IS:1893, IS: 13920)SP :22, SP34.

Text Books:
1. Pillai S. U and Menon D, "Reinforced Concrete Design", Tata McGraw-Hill.
2. Varghese P.C. "Limit State Design of Reinforced Concrete",Prentice Hall India

References:
1. Sinha S.N., *"Reinforced Concrete Design"*, Tata McGraw-Hill.
2. Gambhir M.L., *"Fundamentals of Reinforced Concrete Design", Prentice* Hall India
3. Jain, A.K., *"Reinforced concrete: Limit state design"*, Nem Chand and Bros.
4. Subramanian N*., "Design of Reinforced Concrete Structures"*, Oxford University Press India
5. Park R., and Paulay T., *"Reinforced Concrete Structures"*, John Wiley and Sons.
6. IS456-2000 Code of practice for Plain and reinforced concrete code of practice, BIS, New Delhi

Expected outcomes: On completion of the course, the students will be able: To apply the fundamental concepts of working stress method and limit state method: use IS code of practice for the design of concrete elements; design the beams, slab, stairs, column and footing; draw various RCC structural elements; design masonry structures

_____