**17CE3104 - R.C.C. STRUCTURAL DESIGN – II**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Category** | Professional Core | **Credits** | 4 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 3 - 2 - 0 |
| **Prerequisite** | R.C.C.Structural Design-I and Foundation Engineering. | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

|  |  |  |
| --- | --- | --- |
| **Course Objectives** | 1. To understand the design concept of various foundations. 2. To understand the design concept of various retaining walls. 3. To understand the design of ground liquid retaining structures. 4. To understand the design of elevated liquid retaining structures. 5. To understand the design concept of circular slabs using yield line theory. 6. To understand the behavior of prestressed concrete. | |
| **Course Outcomes** | CO1 | Design various combined foundations. |
| CO2 | Design cantilever and counterfort retaining walls. |
| CO3 | Design ground liquid retaining structures. |
| CO4 | Design elevated liquid retaining structures. |
| CO5 | Design circular slabs using yield line theory. |
| CO6 | Calculate stresses in prestressed concrete structural elements. |
| **Course Content** | **UNIT – I**  **DESIGN OF FOUNDATIONS:** Design of combined footings (Rectangular and Trapezoidal).  **UNIT – II**  **DESIGN OF RETAINING WALLS:** Design of retaining walls – Cantilever and Counterfort types for different loadings.  **UNIT – III**  **DESIGN OF WATER TANKS-I:** Review of working stress design method – Circular and rectangular tanks resting on ground – Circular tanks with IS code method and rectangular tanks with approximate method.  **UNIT – IV**  **DESIGN OF WATER TANKS-II:** Spherical and Conical domes – Design of Intze tanks.  **UNIT – V**  **YIELD LINE THEORY:** Introduction – Behavior of slab up to failure – Assumptions – Guidelines for predicting yield line pattern – Yield criterion – Methods of analysis and basic principles – Virtual work – Equilibrium method – Corner levers – Circular slabs.  **UNIT – VI**  **PRESTRESSED CONCRETE:** Principles of prestressing – Materials used – Methods and Systems of prestressing – Losses of prestress – Analysis of rectangular sections for stresses. | |
| **Textbooks**  **and**  **References** | **TEXTBOOKS:**   1. LSD of Reinforced Concrete by Dr. B. C. Punmia, Ashok Kumar Jain &Arun Kumar Jain. 2. Design of Reinforced Concrete Structures by S. Ramamrutham. 3. Prestressed Concrete by N. Krishna Raju.   **REFERENCE BOOKS:**   1. Limit State Theory and Design of Reinforced Concrete by S. R. Karve& V. L. Shah. 2. Reinforced Concrete Design by C.K Wang, C.G. and J.A. Pincheira. 3. Design of Reinforced Concrete Structures by N. Subramanian. 4. Plain and Reinforced Cement Concrete – Code of practice (IS: 456-2000). | |