PVP23

ADVANCED STRUCTURAL ENGINEERING
(SYLLABUS)

Course Code	23CE4702 A	Year	IV	Semester	I
Course Category	PE – V	Branch	CIVIL	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	SA, DDRCS, DDSS
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks:	100

Course Objectives:

The objective of this course is to:

- To develop an understanding of soil–structure interaction and enable the analysis and design of raft foundations considering stability and serviceability requirements.
- To provide knowledge of structural behavior of water-retaining structures and equip students to analyze and design RCC water tanks under hydrostatic loading.
- To introduce the concepts of load transfer in flat slab systems and enable the analysis and design of flat slabs using standard design methods.
- To familiarize students with loading conditions on RCC chimneys and develop their ability to analyze and design circular chimneys.
- To impart understanding of the behavior of pressed steel tanks and enable the analysis and design of their structural components.

Course Outcomes:

Course will enable the student to:

CO	Statement	Blooms level
CO 1	**Analyze** soil–structure interaction for raft foundations **and design** raft foundations based on stability and serviceability criteria	**L6**
CO 2	**Analyze** structural behavior of water tanks under hydrostatic loads and **Design** of RCC water tanks	**L6**
CO 3	**Analyze** load distribution in flat slab systems and **design** flat slabs using different methods	**L6**
CO 4	**Analyze** loading conditions acting on circular RCC chimneys and **design**	**L6**
CO 5	**Analyze** loading and behavior of pressed steel tanks and **design** basic elements of pressed steel tanks	**L6**

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	1			1			1	3	
CO2	3	3	3	3	1			1			1	3	
CO3	3	3	3	3	1			1			1	3	
CO4	3	3	3	3	1			1			1	3	

CO5	3	3	3	3	1			1			1	3	
Avg	3	3	3	3	1			1			1	3	

Syllabus

Unit No	Content	Mapped COs
I	Analysis and Design of Raft Foundations – Design of RCC Retaining walls: Cantilever- application to simple problems, and Counter fort- design steps only	**CO1**
II	Analysis and Design of RCC Water Tanks, Circular, Intze tank including staging	**CO2**
III	Analysis and Design of Flat Slabs – Direct Design- application to simple problems and Equivalent Frame Methods- design steps only – Check for Punching shear	**CO3**
IV	Analysis and Design of RCC Chimney- Circular shape only, Concepts of loading	**CO4**
V	Analysis and design of Pressed Steel Tanks	**CO5**

Learning Resource(s)

Text Book(s)

1. Reinforced Concrete Structures Vol-2 by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi publications Pvt. Ltd., New Delhi
2. Reinforced Concrete Structures by N. Subramanian, Oxford Publishers
3. Design Drawing of Concrete and Steel Structures by N. Krishna Raju University Press 2005

Reference Book(s)

1. Essentials of Bridge Engineering by D. Johnson Victor, Oxford and IBM publication Co., Pvt. Ltd.
2. Reinforced concrete design by S. U, Pillai and D. Menon, Tata Mc.Grawhill Publishing Company
3. Codes: Relevant IS codes.

E- Resources:

1. https://archive.nptel.ac.in/content/storage2/courses/105108069/mod03/lec03.pdf
2. https://archive.nptel.ac.in/content/storage2/courses/105106117/pdf/9_Special_Topics/Section9.6.pdf
3. https://archive.nptel.ac.in/content/storage2/courses/109104047/lecture24/24_2.htm