ADVANCED STRUCTURAL DESIGN
(ELECTIVE-IV)

Course Code: 13CE1154

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Course Outcomes:

At the end of the course the student will be able to:

CO 1 Demonstrate the ability to design Flat slab system

CO 2 Analyse and design Grid floor system

CO 3 Design Bunkers and Silos

CO 4 Design RC Chimneys for wind and temperature loads

CO 5 Design and details of Plate Girder Bridge

UNIT-I **(12 Lectures)**

FLAT SLABS:

Introduction – Components of flat slab construction- Indian code Recommendations (IS : 456 -2000)- Direct design method – Equivalent frame method – Shear in flat slabs – Detailing of flat slabs- Reinforcement detailing and bar bending schedule need to be prepared.

UNIT-II **(14 Lectures)**

GRID FLOORS:

Introduction – Analysis and design of grid floors – analysis of rectangular grid floors by Timoshenkos plate theory- Reinforcement detailing and bar bending schedule need to be prepared.

UNIT-III **(10 Lectures)**

BUNKERS AND SILOS:

Introduction – difference between bunker & silo – concepts of loading and design.

UNIT-IV (12 Lectures)

CHIMNEYS:

Introduction to chimneys – Parts of chimney – Stress in RC shafts due to self weight and wind loads – Stress due to temperature difference – Design of RC chimneys.

UNIT-V (14 Lectures)

PLATE GIRDER BRIDGES:

Analysis and design of Plate girder bridges- Detailed drawings must be prepared.

TEXT BOOKS:

1. Varghese P.C., *"Advanced Reinforced Concrete Structures"*, 6th Edition, Prentice Hall of India Pvt. Ltd., 2005.
2. Punmia B.C., Ashok Kumar Jain and Arun Kumar Jain, *"Reinforced concrete structures"*, Vol- 2, 5th Edition, Laxmi publications Pvt. Ltd., New Delhi, 2007.
3. Duggal S.K., *"Limit State Design of Steel Structures"*, 1st Edition, TMH, 2011.

REFERENCES:

1. Pillai S.U, and Menon D., *"Reinforced Concrete Design"*, 2nd Edition, Tata Mc Graw hill Publishing Company, 2008.
2. Bhavikatti S.S., *"Advanced RCC Design"*, 4th Edition, New Age International Pvt. Ltd., 2008.
3. Relevant IS: codes.