

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE471	ADVANCED STRUCTURAL DESIGN	3-0-0-3	2016

**Prerequisite : CE304 Design of Concrete Structures- II**

**Course objectives:**

- To enable the students to assess the loads on some important types of structures, choose the method of appropriate analysis according to the situation and perform design
- To analyse and design the special structures in steel and understand the new concepts of design

**Syllabus :**

Design of deep beams, corbels, ribbed slabs, flat slabs, Yield line theory, Design of multi storey buildings, Design of Gantry girder, Design of Industrial structures, beam column connections, Analysis and design of light gauge structures ,Tall structures, Shear wall ductility detailing

**Course Outcomes:**

The students will be able to

- design deep beams, corbels. Ribbed slabs
- design and detail a flat slab and multistory buildings
- analyse and design light gauge structures
- calculate the loads on gantry girder and its design
- design beam column Connections
- analyse, design and detail multistory building for lateral loads

**Text Books / References:**

1. Krishnaraju.N., Advanced Reinforced Concrete Design, CBS Publishers, 2013
2. Mallick S.K. & Gupta A.P., Reinforced Concrete, Oxford & IBH Publishing Co, 6e, 1996.
3. Pankaj Agarwal and Manish Shrikandhe, Earthquake Resistant Design of Structures, PHI, 2006
4. Punmia B. C., Jain A. K. Comprehensive Design of Steel Structures, Laxmi Publications (P) Ltd, 2017.
5. Ramchandra S & Veerendra Gehlot, Design of Steel Structures Vol. II, Standard Book House, 2007
6. S.K.Duggal., Design of steel Structures, Tata McGraw-Hill, 2014
7. Subramanian N, Design of steel Structures, Oxford University Press, 2015
8. Varghese P.C., Advanced Reinforced Concrete Design , PHI, 2005
9. William T Segui., Steel Design , Cenage Learning, 6e, 2017
10. IS 456 -2000 Code of practice for reinforced concrete design, BIS
11. IS 800 – 2007, Code of practice for Structural steel design, BIS

**COURSE PLAN**

Module	Contents	Hours	Sem. Exam Marks %
I	Design of Deep beams & Corbels. Design of Ribbed Slabs. Yield line theory of slabs – Design of Rectangular and Circular slabs for UDL and point load at centre.	6	15
II	Design of flat slabs by direct design method and equivalent	6	15

	frame method as per IS 456-2000. Design of multi-bay multi storied portal frames for gravity loads, Pattern loading - Use of SP 16 (Substitute Frame method of analysis may be followed).		
<b>FIRST INTERNAL EXAMINATION</b>			
<b>III</b>	Design of Light Gauge members - behavior of compression elements- effective width for load and deflection determination- behavior of stiffened and unstiffened elements- moment of resistance of flexural members- design of compression members	7	15
<b>IV</b>	Design of Gantry Girder :Introduction - Loading consideration & maximum load effect Selection of Gantry girder – Design of gantry girders for primary loads only. Codal provisions	7	15
<b>SECOND INTERNAL EXAMINATION</b>			
<b>V</b>	Design of Industrial structures : Introduction – Classification of Industrial structures- load estimation and steps for Analysis and design. Beam column connections (Unstiffened and stiffened)	8	20
<b>VI</b>	Tall Buildings –Introduction, Structural Systems, Principles of design and detailing of Shear wall. Design of Multistoried framed structures for wind and Earthquake Loads- Equivalent static load method of IS 1893.Ductility detailing for earthquake forces- IS 13920	8	20
<b>END SEMESTER EXAMINATION</b>			

### QUESTION PAPER PATTERN (End semester examination)

**Maximum Marks :100**

**Exam Duration: 3 Hrs**

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

**Note :** 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a, b, c, d)