

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CIVIL ENGINEERING)
SEMESTER	6
COURSE TITLE	ADVANCE DESIGN OF STRUCTURES
COURSE CODE	09CI0616
COURSE CREDITS	3

Objective:

- 1 To understand the concepts involved in the design of riveted and welded connections.
- 2 To know the provisions of BIS code for design of built-up sections.
- 3 To analyze T and L shaped beam sections.
- 4 To understand the concept for design of one way and two way slabs.
- 5 To identify short and long columns and their design provisions.
- 6 To understand the design provisions for riveted and welded connections.
- 7 To understand the design provisions for built-up sections.
- 8 To analyze flanged beam sections.
- 9 To understand the design provisions for two way slabs.
- 10 To understand the design provisions for RCC column and isolated footing

Course Outcomes: After completion of this course, student will be able to:

- 1 Design of riveted and welded connections.
- 2 Design of built-up sections.
- 3 Design of flanged beam sections.
- 4 Design of two way slabs.
- 5 Design of RCC column and isolated footings.

Pre-requisite of course:Elementary design of RCC and Steel Sections

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	50	30	20	25	25
Contents : Unit	Topics						Contact Hours
1	Design of Tension members Standard Sections used as a tension member, Design Strength due to yielding of gross section, rupture of critical section & block shear, Design of tension members for angle and channel sections						4

Contents : Unit	Topics	Contact Hours
2	Design of Steel Beams Different steel sections, Simple and built-up sections, Permissible bending stresses, Design of built-up sections (symmetrical I section with cover plates only), check for shear and deflection, Introduction to plate girder: Components and functions (no numerical)	7
3	Design of RC flanged beam General features of T and L beams, Advantages, Effective width as per BIS 456, Design of singly reinforcement T beam, Stress and Strain diagram, Depth of neutral axis, Moment of resistance, T and L beams with neutral axis in flange only, Simple numerical on location of neutral axis, Effective width of flange.	6
4	Design of Two way slab Basic requirements of two way slab, Design criteria of two way slab, Design of two-way simply supported slab	6
5	Design of RCC Column and Footing design: Uni axial bending IS 456 provisions, Column with uni-axial moment, Effective length calculations, Minimum eccentricity, Design of footing for axially loaded column only	5
Total Hours		28

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Assignment -1 Design of Tension members (4 examples)	4
2	Assignment -2 Design of Steel Beam (4 examples)	6
3	Assignment -3 Design of RC Flanged beam (4 examples), Simple numerical on location of neutral axis, Effective width of flange	10
4	Assignment -4 Design of Two-way Slab (4 examples)	4
5	Assignment -5 Design of RCC Column (2 examples), Design of Footing Design (2 examples)	4
Total Hours		28

Textbook :

- 1 Reinforced Concrete Vol. I and Vol. II, Dr. H. J. Shah, Charotar Publishing House Pvt. Ltd., 2021
- 2 Design of Steel Structures by Limit State Method as per IS:800-2007, S. S. Bhavikatti, I. K. International Publishing House Pvt. Ltd., 2012

References:

- 1 Design of Reinforced Concrete Structures, Design of Reinforced Concrete Structures, S. Ramamrutham, Dhanpat Rai Publishing Company, 2013
- 2 Design of Reinforced Concrete Structures, Design of Reinforced Concrete Structures, N. Subramanian, Oxford University Press, 2013
- 3 R.C.C. Designs (Reinforced Concrete Structures), R.C.C. Designs (Reinforced Concrete Structures), Dr. B. C. Punmia Ashok Kumar Jain Arun Kumar Jain, Laxmi Publication Pvt. Ltd., 2015
- 4 Design of Steel Structures, Design of Steel Structures, S. Ramamrutham, Dhanpat Rai Publishing Company, 1986
- 5 Design of Steel Structures Limit State Method, Design of Steel Structures Limit State Method, N. Subramanian, Oxford University Press, 2017
- 6 Design of Steel Structures, Design of Steel Structures, Dr. B. C. Punmia Ashok Kumar Jain Arun Kumar Jain, Design of Steel Structures, 2015

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
20.00	30.00	30.00	20.00	0.00	0.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, videos, e-courses, Virtual Laboratory.

Supplementary Resources:

- 1 <https://archive.nptel.ac.in/courses/105/105/105105105/>