NIRMA UNIVERSITY
School of Engineering, Institute of Technology
B.Tech. in Civil Engineering
Semester- VII

L	T	P	C
3	0	2	4

Course Code	2CL701
Course Name	Design of Steel Structures

Course Outcomes:

At the end of the course, students will be able to –

1. Appraise design philosophies for steel structures
2. Design tension members and connections for steel structures
3. Design various types of compression members for steel structures
4. Design flexural members for steel structures
5. Design industrial structure.

Syllabus **Teaching hours: 45**

Unit 1: Design Methods **Hours: 06**

Types of steel structures, Structural steel sections and properties, Design philosophies and relevant Codal provisions, Plastic Theory: principle, plastic hinge, methods of analysis, shape factor, load factor.

Unit 2: Tension Member **Hours: 06**

Modes of failure, shear lag, built-up section, connections, design and detailing.

Unit 3: Compression Member **Hours: 12**

Failure modes, local and global buckling, effective length, design and detailing compression members with connections; Design and Detailing of built-up section and lacing & battening system, beam-column, base plate.

Unit 4: Flexural Member **Hours: 09**

Behaviour of beams in flexure and shear, web crippling, web buckling, diagonal buckling, design of laterally supported and unsupported beams.

Unit 5: Industrial Structures **Hours: 12**

Components: Roofing system, Trusses, column, lateral load resisting system, gantry girder, footing; Types of trusses and their selection, assessment of loads, effect of wind and earthquake loads, analysis and design of Roof Trusses.

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory Work:

Laboratory work will be based on above syllabus with minimum 05 exercises to be incorporated.

Suggested Readings:

1. Subramanian, N. Design of Steel Structures-Limit State Method, Oxford University Press.
2. Duggal, S.K. Limit State Design of Steel Structures, Tata McGraw Hill.
3. Shiyekar, M. R. Limit State Design in Structural Steel, PHI Learning.
4. Bhavikatti S.S., Design of Steel Structures: by Limit State Method as per IS:800 – 2007, I K publishing House.
5. Gambhir, M. L. Fundamentals of Structural Steel Design, Tata McGraw-Hill Education.
6. Ramamrutham, S. Design of Steel Structures, Dhanpat Rai Publishing Company.
7. IS CODES : IS 456, IS800 , IS 875, SP16, SP34, SP.6(1)

L= Lecture, T= Tutorial, P= Practical, C= Credit

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w.e.f. academic year 2021-22 and onwards