



Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2022-2023

Course Handout Part II

Date: 16/01/2023

In addition to part -I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **CE F343**
Course Title : **Design of Steel Structures**
Instructor-in-charge : **Chandu Parimi**

1. Scope and Objective of the Course

The course intends to impart design skills to common type of Civil Engineering Steel Structures as found in practice. An understanding of basic design concepts, loads and stresses to be used as per Indian standards for steel design work will be developed. The course deals with designing of steel structural elements subjected to axial tension, axial Compression and bending. The course will cover the following:

Introduction to Limit State Design and Plastic design; Limit state design of bolted and welded connections; Eccentric connection; Design of Tension Members; Design of Compression Members; Design of Beams; Design of plate girders ,Design of Beam-Columns, Column bases.

2. Text Book

L. Subramanian, "Steel Structures Design and Practice", Oxford University Press. 1st Edn., 2018

Reference Books

- i. S k Duggal, "Limit State Design of Steel Structures", TMH, 2011
- ii. A S Arya and Ajmani "Design of Steel Structures" Nemi Chand & Bros.
- iii. P. Dayaratnam "Design of Steel Structures", Wheeler Pub. 1992.
- iv. E H Gaylord and C N Gaylord "Design of steel structures" McGraw Hill
- v. IS 800:2007 "Code of practice for General construction in steel "B.I.S.
- vi. IS 875 :1987 "Code of practice for design Loads"

3. Course Plan:

Lecture Nos.	Learning Objectives	Topics to be covered	Reference to Text Book
1-5	Structural steel, basis of design	Introduction, Chemical and mechanical properties of steel, resistance to corrosion and fatigue, types of steel structures, codes and specifications, design philosophies	TB. / Code Book

		(working stress and Limit State).	
6-9	Design of Bolted Connections	Failure modes of bolts, codal provisions and designing bolted connections	TB. / Code Book
10-12	Design of Welded Connections	Theory and codal provisions and designing welded connections. Types of welds.	TB. / Code Book
13-15	Design of Tension Members	Types of tension members, modes of failure, Net area, Net sectional area, Design, Lug Angles, Tension Splices, gussets.	TB. / Code Book
16-20	Design of Compression Members	Behavior of compression members, possible failure modes, single angle struts, design, built-up compression members, column bases and caps.	TB. / Code Book
21-24	Design of Beams	Types and classification, Lateral stability of beams, shear strength, shear strength, web buckling and crippling, and purlins.	TB. / Code Book
25-28	Design of Plate Girders	Design of web, flanges, curtailment of flanges, stiffeners, web and flange splices, economic depth of plate girders, example problem.	TB. / Code Book
29-32	Design of beam-columns	Behavior, equivalent moment factor, eccentricity, beam-column subjected to tension and bending, design.	TB. / Code Book
33-36	Design of column bases.	Design of column bases, baseplates and anchor bolts.	TB. / Code Book
37-42	Introduction to plastic design	Plastic theory, theorems of plastic collapse, methods of plastic analysis, plastic designs of portal frames, behavior and ultimate strength of plates.	TB. / Code Book

4. Evaluation Scheme

EC No.	Evaluation Component	Duration	weightage	Date & Time	Remarks
1	Test	1.5 hr	25	16/03 4.00 - 5.30PM	CB
2	Classroom Interaction	-	15	In Class	OB
3	Class Project / Home assignments	-	25	In Class	OB
4	Comprehensive Exam	3 hrs.	35	16/05 AN	OB

5. **Chamber Consultation Hour:** To be announced in the class.

6. **Notice:** All notices will be on Google Classroom. Students are not allowed without an original copy of the code book.
7. **Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.
8. **Make up Policy:** Prior permission for all make ups are a must.

Instructor-in-charge
CE F343