

Approval : 9th Senate Meeting

Course Number: CE 401

Course Name: Design of Steel Structures

Credits: 2-1-0-3

Prerequisites: CE 301- Strength of Materials and Structures

Intended for: UG

Distribution: Discipline Core

Semester: Odd/Even

Preamble: The design of steel structures constitutes a significant facet of civil engineering practice. Based on the previously taught concepts relating to mechanics of rigid bodies, structural analysis and design, the present course is to enable the student in realizing the physical design of structural steel elements as per to the guidelines of IS 800: 2007.

Course Outline: The course encompasses the study of standard design procedures for common structural elements as per to the provisions of IS 800:2007. It concludes with an overview to the advanced topic of design for fatigue.

Modules:

1. Design of connections: rivet, bolt and welding **(5 contact hours)**
2. Tension and Compression member: load calculation and design **(5 contact hours)**
3. Design of members subjected to Unsymmetrical Bending **(5 contact hours)**
4. Design of Plate Girder **(5 contact hours)**
5. Design of Base-plate and Anchor **(5 contact hours)**
6. Design of Composite beams and Slabs **(5 contact hours)**
7. Plastic analysis and design of continuous beam and simple frame **(5 contact hours)**
8. Design of a multi-storey building and industrial shed **(5 contact hours)**
9. An overview of design for fatigue **(2 contact hours)**

Text books:

- a) N. Subramanian, 'Design of steel structures', Oxford University Press, USA, 2008.

- b) S. K. Duggal, 'Limit state design of steel structures', McGraw Hill Education, New Delhi, 2014.

Reference books:

- a) C.G. Salmon, J.E. Johnson, and F.A. Malhas, 'Steel structures: design and behavior: emphasizing load and resistance factor design 5th Edn.'. Pearson, NJ, 2008.
- b) Trahair, N.S., M. A. Bradford, D. Nethercot and L. Gardner., 'The behavior and design of steel structures to EC3', Taylor and Francis, NY, 2008.
- c) A. Nussbaumer, L. , Borges and L. Davaine, 'Fatigue Design of Steel and Composite Structures', John Wiley & Sons, 2011.