CIPC3004 DESIGN OF STEEL STRUCTURE (3-0-0)

Course objectives

- To learn the basic concepts of designing of structural elements in steel structures and well versed with Steeldesign principles according to the guidelines of IS: 800-2007.
- To design tension and compression members following the guidelines of relevant IS codes.
- To familiar with designing of beams and to able to design Plate girders and its components
- To Evaluate stability and failure modes of steel members, including beams, columns, and plate girders.

Module I

Introduction, advantages/disadvantages of steel, structural steel, rolled steel section, various types of loads, design philosophy. Limit state design method, limit states of strength and serviceability, probabilistic basis for design Riveted, bolted and pinned connections, Welded connections-assumptions, types, design of fillet welds, intermittent fillet weld, plug and slot weld, failure of welded joints, welded joints vs bolted and riveted joints

Module II

Tension members, types, net cross-sectional area, types of failure, slenderness ratio, design of tension members, gusset plate. Compression members, effective length, slenderness ratio, types of cross-section, classification of crosssection, design of axially loaded compression members, lacing, battening, design of column bases, and foundation bolts.

Module III

Design of beams, types of c/s, lateral stability of beams, lateral torsional buckling, bending and shear strength, web buckling and web crippling, deflection, design procedure.

Module IV

Plate girders- various elements and design of components Eccentric and moment connections, roof trusses

Course outcomes

After successfully studying this course, students will able to:

- explain: the engineering properties and the behaviour of steel structural elements according to the
- analyze and design: Structural connection of Steel Elements.
- analyse and design: the steel structural elements of different forms under different stresses.
- produce professional-quality design documentation that includes calculations, sketches, and design reports for real-world applications.

Books:

- N. Subramanian, Design of Steel Structures- Limit State Method; Oxford University Press
- S.K. Duggal, Limit State Design of Steel structures, McGraw Hill Education.
- S.S. Bhavikatti, Design of Steel Structures: By Limit State Method I.K. International Publishing House Pvt. Ltd.
- M.L.Gambhir, Fundamentals of Structural Steel Design,McGraw Hill Education
- M. R. Shiyekar, Limit State Design in Structural Steel,PHI Learning Private Limited