

OBJECTIVES:

To introduce the design of various timber components in a building.

To enable the understanding of the types, efficiency and strength, advantages and disadvantages of Rivet and welded joints in steel.

To enable the design of Tension (beams) and compression (columns) steel members in a building under various conditions.

Case studies and models wherever applicable.

UNIT I TIMBER STRUCTURES - DESIGN OF BEAMS AND COLUMNS 7

Grading of Timber – Permissible Stresses – Design of timber beams – Madras terrace roof – Design of timber columns.

UNIT II STEEL STRUCTURES - BOLTED AND WELDED JOINTS 12

Assumptions – failure of Bolted joints – Strength and Efficiency of Bolted Joints – Types – Design of Bolted Joints for Axially Loaded Members (Excluding eccentric connections) Types of welded joints – Advantages and disadvantages – Design of Fillet welds (Excluding eccentric connections). (Exercises)

UNIT III TENSION MEMBERS 8

Introduction – Net sectional area – permissible stresses. Design of Axially loaded Tension member – Lug angle – code provision – tension splice.

UNIT IV COMPRESSION MEMBERS 10

Introduction – various sections – built up section – Design of columns (excluding Lacing, Battening and other connections.)

UNIT V STEEL BEAMS 8

Introduction – laterally supported and unsupported beams – Design of laterally supported beams.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

Design the timber beams and columns by applying the codal provisions. Able to design the steel joints for maximum efficiency and strength.

Tension members and compression members are designed for various conditions by applying the codal provisions.

Different types of laterally unsupported & supported beams to be designed for various conditions.

REQUIRED READING:

M.R. Shiyekar, "Limit State Design in Structural Steel", PHI Learning Private Limited, 2010.

N. Subramanian, "Design of Steel Structures", Oxford Higher Education, 2008.

REFERENCES:

S.K. Duggal, "Limit State Design of Steel Structures", McGraw Hill Education, Private Limited, 2010.

Dr. V. L. Shah, Prof. Veena Gore, "Structures Publications", Pune, 2012.

S.S. Bhavikatti, "Design of Steel Structures" by Limit State Method as per IS800-2007, I.K. International Publishing House Pvt, Ltd, 2012.

