

<b>Devi Ahilya University, Indore, India</b> <b>Institute Of Engineering &amp; Technology</b>			
<b>Subject code and name</b>	<b>Type</b>	<b>L-T-P</b>	<b>Credits</b>
VLR6C3: Design of Steel Structures – I	<b>L</b>	<b>T</b>	
	<b>PC</b>	<b>3-1-1</b>	<b>4+1 (P)</b>

**Objective of the subject:**

- i. To learn the properties of steel sections and design basics and codal provisions Design of connections
- ii. To design steel members subjected to tension and compression members
- iii. Design steps involved in beams, built up beams and connections in beam column etc.
- iv. Design of element in roof trusses, joints, etc. use of hand hooks in steel trusses design
- v. To design plate girders, gantry girders and light gauge sections

**Prerequisite(s):** Mathematical Methods and Mechanics of Materials.

**COURSE CONTENTS**

**Unit I: Introduction**

Properties of structural steel, Structural steel sections, Limit state and working stress design concepts, Types of connections, Design of bolted, riveted and welded joints, Eccentric connections - Efficiency of joints, High Tension bolts.

**Unit II : Tension members and Compression members**

Types of sections, Net area, Net effective sections for angles and Tee in tension, Design of connections in tension members, Use of lug angles, Design of tension splice , Concept of shear lag  
Types of compression members, Theory of columns, Basis of current codal provision for compression member design, Slenderness ratio, Design of single section and compound section compression members, Design of lacing and battening type columns, Design of column bases , Gusseted base

**Unit III : Beams**

Design of laterally supported and unsupported beams, Built up beams, Beams subjected to biaxial bending , Design of plate girders riveted and welded , Intermediate and bearing stiffeners, Web splices

**Unit IV : Roof Trusses And Industrial Structures**

Roof trusses , Roof and side coverings – Design loads, design of purlin and elements of truss; end bearing , Design of gantry girder

**Unit V: Light Gauge Sections**

Light gauge steel structures – Types of sections, Flat width ratio, Buckling of thin elements, Effective design width, Form factor, Design of tension, compression members and beams.

**NOTE:** - All the designs for strength and serviceability should strictly be as per the latest version of IS:800.

**REFERENCE: -**

1. Design of steel structures by Arya & Azmani Nemchand & Bros, Roorkee
2. Design of steel structures by P.Dayaratnam
3. Design of steel structures Vol. I & II by Ramchandra
4. Design of steel structures by L.S. Negi
5. Design of steel structures by Ramammutham
6. Design of steel structures by Punmia
7. Design of Steel Structures – Duggal.
8. IS-800-2007.

**Course Outcomes:**

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

1. Design tension and compression members
2. Design beams and beam columns
3. Design bolt and weld connections
4. Design built up members and column base