

Course Code	Course Title	L	T	P	C
20SE007	ADVANCED DESIGN OF STEEL STRUCTURES	3	0	3	5

**PRE-REQUISITE COURSES:** DESIGN OF STEEL STRUCTURES

**COURSE OBJECTIVES:**

The objectives are to provide students with advanced knowledge of steel structural design. Application of the underlying principles to solve a wide range of structural steel problems. This subject will provide students the basic principles of reliability based design on steel structures. Understanding of the relationship between structural analysis and design provisions.

**COURSE OUTCOMES:**

At the end of the course student will be able to

CO's	Course Outcomes	PO's
1	To Gain knowledge about Plastic analysis of steel structures	1,2
2	To analyze and design of girders	3
3	To analyze and design of steel tanks and stacks	1,2
4	To analyze and design of Industrial buildings	1,2
5	To analyze and design of Light Gauge Steel structures.	3

**SKILLS:**

- ✓ Design and analysis of girders under maximum load effects
- ✓ Design and analysis of cold-formed steels under stiffened and un stiffened conditions
- ✓ Design and analysis of industry buildings

#### **UNIT-I:**

**PLASTIC ANALYSIS OF STRUCTURES:** Introduction, Shape factor, Moment redistribution, Combined mechanisms, Analysis of portal frames, Effect of axial force - Effect of shear force on plastic moment.

#### **UNIT-II:**

**DESIGN OF GIRDERS:** Plate girders – Design procedures - Design of plate girders using IS 800 codal provisions– Gantry girder- Loading Consideration- Maximum Load Effects- Fatigue Effects- Selection of Gantry Girder-Design of Gantry girder

#### **UNIT-III:**

**DESIGN OF STEEL TANKS AND STACKS:** Introduction –Elevated Tanks – circular tanks- rectangular tanks- Design of Self-supporting Stacks–.Guyed steel stacks – Pull on Guy wires .

#### **UNIT-IV:**

**DESIGN OF INDUSTRIAL STRUCTURES:** Introduction - Selection of Roofing and Wall Material - Selection of Bay Width - Structural Framing - Purlins, Girts, and Eave Strut - Plane Trusses – End Bearings.

#### **UNIT-V:**

**DESIGN OF LIGHT GAUGE STEEL STRUCTURES:** Introduction – Shapes – Definitions – properties of section –local buckling of plate elements – Effective design width – Specifications – Basic Allowable design stresses – Allowable compressive stresses in unstiffened elements – compression members – flexural members

#### **TEXT BOOKS:**

1. Subramanian.N,“DesignofSteelStructures”,OxfordUniversityPress, 2008.
2. Dayaratnam.P, “Design of Steel Structures”, A.H.Wheeler, India,2007.
3. Duggal S.K, “Design of Steel Structures”, Tata McGraw Hill, India,2014

#### **REFERENCES:**

1. Linton E. Grinter, “Design of Modern Steel Structures”, Eurasia Publishing House, New Delhi,1996.
2. Bhavikatti S.S, “Design of Steel Structures”, I. K. International Pvt Ltd, 2009
3. Negi.L.S, “Design of Steel Structures”, Tata McGraw Hill, India,2007