ADVANCED STEEL STRUCTURAL DESIGN
(Professional Core)

Course Code: 19CE2205	**L**	**P**	**C**
	3	**0**	**3**

Course Outcomes:
At the end of the course the students will be able to
CO1: Design the members subjected to axial compression and bending
CO2: Design of structures connection between the members
CO3: Design Rail Bridge under given loading condition
CO4: Design the light gauge flexural and compression members
CO5: Design the pre-engineered building

UNIT I **(10-Lectures)**

DESIGN OF MEMBER UNDER AXIAL LOAD AND MOMENT

Design of compound column only for axial loads; Design of members subjected to axial load and moment.

LO 1: Learn the concepts of analysis of columns subjected to axial compression and moment.

LO2: Design the compound columns under combination of loads and moments.

UNIT II **(10-Lectures)**

DESIGN OF CONNECTIONS

Types of connections – Welded and Bolted –Seated Connections – Unstiffened and Stiffened seated Connections – Moment Resistant Connections – Clip angle Connections – Split beam Connections – Framed Connections, HSFG bolted connections. Lug analysis and lug failures

LO1: Analyze and design the simple and moment resisting bolted connection.

LO2: Analyze and design the simple and moment resisting welded Connection.

UNIT III **(10-Lectures)**

DESIGN OF RAILWAY BRIDGES

Analysis of truss bridge due to railway loading including wind loads, analysis of plate girder bridges –design of truss bridge and plate girder bridges.

LO1: Analyze and design of truss bridge.

LO2: Analyze and design of plate girder bridge.

UNIT IV **(10-Lectures)**

DESIGN OF LIGHT GAUGE STEEL STRUCTURES

Introduction to Direct Strength Method – behavior of Compression Elements – Effective width for load and deflection determination – behavior of Unstiffened and Stiffened Elements – Design Flexural members – Design of Compression Members including detailing

LO1: Analyze and design the flexural members

LO2: Analyze and design the compression members subjected to axial load only.

UNIT V **(10-Lectures)**

PRE-ENGINEERED BUILDING

Introduction – section specification – types of assemblies – analysis and design of pre-engineered building – connection details.

LO1: Understand the concept related to PEB.

LO2: Design a PEB structure for a given load.

Text books:

1. Duggal.S.K., (2014), Limit State Design of Steel Structures, Tata McGraw-Hill Education, New Delhi.
2. Subramanian. N., (2011), Design of Steel Structures, Oxford University Press, New Delhi.
3. B.C. Punmia, A.K.Jain ―Design of Steel Structures‖ 1998, laxmi publications Pvt. Ltd., New Delhi.

References :

1. Bhavikatti. S.S., (2012), Design of Steel Structures, I.K. International Publishing House Pvt. Ltd. New Delhi.
2. IS 800 General Construction in Steel — Code of Practice
3. IS 801: Code of Practice for use of Cold-Formed Light Gauge Steel Structural Members in General Building Construction.
4. IS 811: Specification for Cold formed light gauge structural Steel sections.