19CE4701A –ADVANCED DESIGN OF STEEL STRUCTURES

Course Category:	Program Elective	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisites:	19CE3601 - Design of Steel Structures	Continuous Evaluation:	30
		Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Analyze** and **design** cross section of plate girder and its connections.	K6
CO2	**Analyze** and **design** web stiffeners, web splice of plate girder.	K6
CO3	**Analyze** and **design** roof trusses and purlins.	K6
CO4	**Analyze** and **design** column bases and grillage foundation.	K6
CO5	**Analyze** and **design** gantry girder.	K6

Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3		2		2			2		2	3	
CO2	2	2	3		2		2			2		2	3	
CO3	2	2	3		2		2			2		2	3	
CO4	2	2	3		2		2			2		2	3	
CO5	2	2	3		2		2			2		2	3	
Avg.	2	2	3		2		2			2		2	3	

1- Low **2-Medium** **3-High**

Course Content

UNIT-1	**Plate Girders:** Components of a plate girder, economical depth, design of flanges, design of cross section of plate girders, design of connection.	CO1
UNIT-2	**Plate Girders:** Web stiffeners - design of vertical, horizontal and bearing stiffener, web splice.	CO2
UNIT-3	**Roof Trusses:** Types of trusses, economical spacing of roof trusses, loads on roof trusses, estimation of wind load on roof trusses as per IS:875, design of members of roof truss and joints, design of purlins.	CO3
UNIT-4	**Column Bases and Foundations:** Slab base, gusset base and grillage foundations for axially loaded columns.	CO4
UNIT-5	**Gantry Girder:** Introduction - loading consideration and maximum load effect - selection of gantry girder – design of gantry girders for primary loads only.	CO5

Learning Resources

Text Books	1. S.K. Duggal, Limit state Design of steel structures, 2/e, Tata McGraw Hill, 2017. 2. N. Subramanyam, Design of Steel Structures, 2/e, Oxford University Press, 2016.
Reference Books	1. V.L. Shah and Veena Gore, Limit State Design of steel structures IS:800-2007, Structures Publications, 2012. 2. M.L. Gambhir, Fundamentals of Structural Steel Design, McGraw Hill Education, 2013. 3. Ramachandra and V. Gehlot, Design of Steel Structures, 2/e, Scientific Publishers, 2015.

e-Resources& other digital material	1. https://freevideolectures.com/course/2679/design-of-steel-structures/38 2. http://nptelvideos.com/video.php?id=1655 3. https://www.digimat.in/nptel/courses/video/105103094/L36.html 4. http://www.nptelvideos.in/2012/11/design-of-steel-structures.html-