

**20CE4702A –ADVANCED DESIGN OF STEEL STRUCTURES**

<b>Offering Branches</b>	CE		
Course Category:	Professional Elective	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisites:	20CE3601-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:

<b>CO1</b>	<b>Analyze and design</b> cross section of plate girder and its connections.	K6
<b>CO2</b>	<b>Analyze and design</b> web stiffeners, web splice of plate girder.	K6
<b>CO3</b>	<b>Analyze and design</b> roof trusses and purlins.	K6
<b>CO4</b>	<b>Analyze and design</b> column bases and grillage foundation.	K6
<b>CO5</b>	<b>Analyze and design</b> 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
<b>CO1</b>	2	2	2		2		3			3		3	2	
<b>CO2</b>	2	2	2		2		3			3		3	2	
<b>CO3</b>	3	3	3		3		3			3		3	3	
<b>CO4</b>	2	2	2		2		3			3		3	2	
<b>CO5</b>	2	2	2		2		3			3		3	2	
<b>Avg.</b>	<b>2</b>	<b>2</b>	<b>2</b>		<b>2</b>		<b>3</b>			<b>3</b>		<b>3</b>	<b>2</b>	

**1- Low**

**2-Medium**

**3-High**

**Course Content**

<b>UNIT-1</b>	<b>PLATE GIRDERS</b> Components of a plate girder, economical depth, design of flanges, design of cross section of plate girders, design of connection.	CO1
<b>UNIT-2</b>	<b>PLATE GIRDERS</b> Web stiffeners - design of vertical, horizontal and bearing stiffener, web splice.	CO2
<b>UNIT-3</b>	<b>ROOF TRUSSES</b> 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
<b>UNIT-4</b>	<b>COLUMN BASES AND FOUNDATIONS</b> Slab base, gusset base and grillage foundations for axially loaded columns.	CO4
<b>UNIT-5</b>	<b>GANTRY GIRDER</b> Introduction - loading consideration and maximum load effect - selection of gantry girder – design of gantry girders for primary loads only.	CO5

**Learning Resources**

<b>Text Books</b>	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.
<b>Reference Books</b>	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.
<b>e- Resources &amp; other digital material</b>	1. <a href="https://freevidelectures.com/course/2679/design-of-steel-structures/38">https://freevidelectures.com/course/2679/design-of-steel-structures/38</a> 2. <a href="http://nptelvideos.com/video.php?id=1655">http://nptelvideos.com/video.php?id=1655</a> 3. <a href="https://www.digimat.in/nptel/courses/video/105103094/L36.html">https://www.digimat.in/nptel/courses/video/105103094/L36.html</a> 4. <a href="http://www.nptelvideos.in/2012/11/design-of-steel-structures.html">http://www.nptelvideos.in/2012/11/design-of-steel-structures.html</a>