



SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY
COURSE PLAN (THEORY)



ACADEMIC YEAR: 2018-2019(Even)

Subject Code	CE6603		L	P	T	C
Subject Title	Design of steel structures		3	0	0	4
Year / Dept / Sem	III / CIVIL / VIS	Regulation Year	2013			
Faculty Name / Designation / Dept	Mr.J. SEYON RAJA/ Assistant Professor / CIVIL					
Course Prerequisite	1. The students must have more knowledge about basic fundamentals of mathematics. 2. They have more details about types of steel sections and basic concepts about connections					
CE6603	DESIGN OF STEEL STRUCTURES		L T P C			
UNIT I	INTRODUCTION		3 0 0 4 9			
Properties of steel – Structural steel sections – Limit State Design Concepts – Loads on Structures– Connections using rivets, welding, bolting – Design of bolted and welded joints – Eccentric connections - Efficiency of joints.						
UNIT II	TENSION MEMBERS		6			
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						
UNIT III	COMPRESSION MEMBERS		12			
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 laced and battened type columns – Design of column bases – Gusseted base						
UNIT IV	BEAMS		9			
Design of laterally supported and unsupported beams – Built up beams – Beams subjected to uniaxial and biaxial bending – Design of plate girders - Intermediate and bearing stiffeners – Flange and web splices						
UNIT V	ROOF TRUSSES AND INDUSTRIAL STRUCTURES		9			
Roof trusses – Roof and side coverings – Design of purlin and elements of truss; end bearing – Design of gantry girder.						

TEXT BOOKS:

1. Gambhir. M.L., "Fundamentals of Structural Steel Design", McGraw Hill Education India Pvt. Ltd., 2013
2. Shiyekar. M.R., "Limit State Design in Structural Steel", Prentice Hall of India Pvt. Ltd, Learning Pvt. Ltd., 2nd Edition, 2013.
3. Subramanian.N, "Design of Steel Structures", Oxford University Press, New Delhi, 2013.

REFERENCES:

1. Narayanan.R.et.al. "Teaching Resource on Structural Steel Design", INSDAG, Ministry of Steel Publications, 2002
2. Duggal. S.K, "Limit State Design of Steel Structures", Tata McGraw Hill Publishing Company, 2005
3. Bhavikatti.S.S, "Design of Steel Structures" By Limit State Method as per IS:800–2007, IK International Publishing House Pvt. Ltd., 2009
4. Shah.V.L. and Veena Gore, "Limit State Design of Steel Structures", IS 800–2007 Structures Publications, 2009.

Course Objectives (CO)	<p>CO1: To introduce the students to limit state design of structural steel members subjected to compressive loads.</p> <p>CO2: To introduce the students to limit state design of structural steel members subjected to tensile loads.</p> <p>CO3: To introduce the students to limit state design of structural steel members subjected to bending loads</p> <p>CO4: To introduce the students to limit state design of structural steel members including connections.</p> <p>CO5: Design of structural systems such as roof trusses as per provisions of current code (IS 800 - 2007) of practice</p> <p>CO6 : Design of structural systems such as gantry girders as per provisions of current code (IS 800 - 2007) of practice</p>
Expected Course Outcomes (ECO)	<p>At the end of the course, the students should be able to:</p> <p>ECO1.The students would have knowledge on the design of structural steel members subjected to compressive, tensile and bending forces, as per current code.</p> <p>ECO2.The student will able to perform plate girders and steel structures such as roof trusses and building frames for industrial buildings.</p>

					ECO3.The student will able to perform analysis and design of tubular structures. ECO4.The student will able to introduce analysis and design of steel transmission line towers and tower foundations. ECO5.The student will able to analyze and design various types of steel bridges. ECO6.The student will able to analyze and design aluminum and light weight structures							
Mapping of CO & PO(Specify the PO's) - <i>(Fill the col.s with the legend given below)</i>												
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	3	-	2	-	-	-	-	-	-	-	-	2
C02	2	-	-	-	-	-	-	-	1	-	-	-
C03	2	2	1	1	-	-	-	-	1	-	-	-
C04	2	2	2	1	-	-	-	-	1	-	-	-
C05	2	2	2	1	-	-	-	-	1	-	-	-
C06	2	2	2	1	-	-	-	-	1	-	-	-
Bridging the Curriculum Gap (Additional Topics beyond syllabus/Seminars/Assignments)				BCG1: Introduction to composite construction of buildings BCG2: High Tensile Bolts BCG3: Types of Structural Connections								
Related Website URLs				W1: www.liv.ac.uk/~halim/COMP.ppt W2: www.transportation.nebraska.gov/ref-mn/specbooke/1000-.pdf W3: http://www.sals.org.cn/teaching/zhaosir/connection-6.pdf								
Related Video Course Materials (min. 3 no.s)				V1: https://www.youtube.com/watch?v=KQEDlqvPmO8 V2: https://www.youtube.com/watch?v=JwCAn3_1lfA V3: https://www.youtube.com/watch?v=TsdS1unC8xI								

S.No	Topic Name	Book	Page no	Mode of delivery	No of hrs	Cumulative hrs
UNIT I INTRODUCTION						
1	Properties of steel – Structural steel sections	T1	1-5	Class room teaching	1	1
2	Limit State Design Concepts	T1	7	Class room teaching	2	3
3	Loads on Structures	T1	9-12	Seminars	1	4
4	Connections using rivets, welding, bolting	T1	12-16	Class room teaching	2	6
5	Design of bolted and welded joints	T1	513-519	Class room teaching	2	8
6	Eccentric connections	T2	242-260	Class room teaching	1	9
7	Efficiency of joints.	T2	261-296	Class room teaching	1	11
8	University problems			Tutorials	2	12
UNIT II TENSION MEMBERS						
1	Types of sections	T1	48-88	Seminars	2	14
2	Net area	T1	119-133	Class room teaching	1	15
3	Net effective sections for angles and Tee in tension	T1	134-145	Class room teaching	1	16
4	Design of connections in tension members	T1	189-199	Class room teaching	1	17
5	Use of lug angles	T1	200-213	Class room teaching	1	18
4	Design of tension splice	T1	214-265	Class room teaching	2	20
5	Concept of shear lag	T1	205-207	Assignments	2	22
6	University problems			Tutorials	2	24
UNIT III COMPRESSION MEMBERS						
1	Types of compression members	T1	170-179	Class room teaching	1	25
2	Theory of columns	T1	180-188	Class room teaching	1	26
2	Basis of current codal provision for compression member design – Slenderness ratio	T1	173-176	Seminars	2	28
3	Design of single section and compound section compression members	T1	89-118	Class room teaching	2	30
4	Design of laced and battened type columns	T1	388-420	Class room teaching	2	32
5	Design of column bases	T3	350-364	Class room teaching	1	33

6	Gusseted base	T3	365-376	Class room teaching	1	34
6	University problems			Tutorials	2	36
UNIT IV BEAMS						
1	Design of laterally supported and unsupported beams	T1	266-267	Class room teaching	2	38
2	Built up beams	T1	267-268	Class room teaching	2	40
3	Beams subjected to uniaxial	T1	272-280	Class room teaching	1	41
4	Beams subjected to biaxial	T1	281-287	Class room teaching	1	42
5	Design of plate girders	T3	290-302	Class room teaching	2	44
6	Intermediate and bearing stiffeners	T1	302-316	Class room teaching	1	45
7	Flange and web splices.	T1	317-323	Class room teaching	1	46
8	University problems			Tutorials	2	48
UNIT V ROOF TRUSSES AND INDUSTRIAL STRUCTURES						
1	Roof trusses	T3	372-387	Class room teaching	2	50
2	Roof and side coverings	T3	388-402	Class room teaching	2	52
3	Design of purlin and elements of truss	T3	497-500	Class room teaching	2	54
4	End bearing	T3	448-452	Class room teaching	2	56
5	Design of gantry girder.	T3	501-505	Class room teaching	2	58
6	University problems			Tutorials	2	60

	Prepared by	Approved by
Signature		
Name	Mr.J. SEYON RAJA	Mr.P.GANESAN
Designation	Assistant Professor / CIVIL	HOD (CIVIL)
Signed date		

LEGEND:

METHODOLOGY TO MAP OBJECTIVE WITH OUTCOME

Course outcomes are achieved through

- a. Suitable Analogies.
- b. Class room teaching.
- c. Assignments.
- d. Tutorials
- e. Weekly, monthly and model exams.
- f. Brain storming.
- g. Group discussion and role play.
- h. Seminars