

DESIGN OF INDUSTRIAL STRUCTURES

II Semester: ST																													
Course Code	Category	Hours / Week			Credits	Maximum Marks																							
BSTB18	Elective	L	T	P	C	CIA	SEE	Total																					
		3	0	0	3	30	70	100																					
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45																								
I. COURSE OVERVIEW: The purpose of this course is to develop an in-depth knowledge in the area of design of industrial structure with the latest code of practice as per the Indian Standard. On completion of this course student gain good confidence in designing major industrial structures like bridge plate girders, industrial structures like gantry girders, water tanks, support structures, high rise chimneys and pre-engineered thin walled structures.																													
II. COURSE OBJECTIVES: The student will try to learn: I. Design principles of Steel Gantry Girders, bunkers and silos. II. The design and detailing of portal frames and gable frames III. The design of, resting on the ground and elevated water tanks according to IS code.																													
III. COURSE OUTCOMES: <table><tr><td colspan="3">After successful completion of the course, students should be able to:</td></tr><tr><td>CO 1</td><td>Discuss the planning and functional requirements of Industrial structures.</td><td>Understand</td></tr><tr><td>CO 2</td><td>Discover the need to learn about the design concepts, and constructional aspects of Industrial structures</td><td>Create</td></tr><tr><td>CO 3</td><td>Analyze and evaluate the importance of various construction materials for Industrial constructions</td><td>Analyze</td></tr><tr><td>CO 4</td><td>Design portal frames, tower cranes and bracing system in Industrial buildings.</td><td>Create</td></tr><tr><td>CO 5</td><td>Analyze and design various structural elements in water tanks</td><td>Analyze</td></tr><tr><td>CO 6</td><td>Analyze and design structural elements used in pre-cast construction including fabrication, erection and installation</td><td>Analyze</td></tr></table>									After successful completion of the course, students should be able to:			CO 1	Discuss the planning and functional requirements of Industrial structures.	Understand	CO 2	Discover the need to learn about the design concepts, and constructional aspects of Industrial structures	Create	CO 3	Analyze and evaluate the importance of various construction materials for Industrial constructions	Analyze	CO 4	Design portal frames, tower cranes and bracing system in Industrial buildings.	Create	CO 5	Analyze and design various structural elements in water tanks	Analyze	CO 6	Analyze and design structural elements used in pre-cast construction including fabrication, erection and installation	Analyze
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IV. SYLLABUS																													
UNIT-I	STEEL GANTRY GIRDERS						Classes: 09																						
Introduction, loads acting on gantry girder, permissible stress, types of gantry girders and crane rails, crane data, maximum moments and shears, construction detail, design procedure.																													
UNIT-II	PORTAL FRAMES						Classes: 09																						
Design of portal frame with hinge base, design of portal frame with fixed base -Gable Structures – Lightweight Structures																													
UNIT-III	STEEL BUNKERS AND SILOS						Classes: 09																						
Design of square bunker, Jansen’s and Airy’s theories, IS Code provisions – Design of side plates. Stiffeners, Hooper, Longitudinal beams Design of cylindrical silo, Side plates, ring girder, stiffeners.																													

UNIT-IV	CHIMNEYS	Classes: 09
Introduction, dimensions of steel stacks, chimney lining, breech openings and access ladder, loading and load combinations, design considerations, stability consideration, design of base plate, design of foundation bolts, design of foundation		
UNIT-V	WATER TANKS, DESIGN OF PRESSED STEEL WATER TANK	Classes: 09
Design of stays: Joints, Design of hemispherical bottom water tank, side plates, Bottom plates, joints, Ring girder: Design of staging and foundation.		
Text Books:		
1. Punmia B. C., Jain Ashok Kr., Jain Arun Kr, “Design of Steel Structure”, Lakshmi Publishers, 2 nd Edition, 1998.		
Reference Books:		
1. Ram Chandra, “Design of Steel Structures’, Standard Publishers, 12 th Edition, 2009.		
2. Subramaniam., “Design of Steel Structures,		
Web References:		
1. http://nptel.ac.in/courses/105106113/3		
E-Text Books:		
1. http://nptel.ac.in/downloads/105106113/		