COURSE CONTENT

DESIGN OF INDUSTRIAL STRUCTURES								
II Semester: ST								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BSTD21	**Elective**	3	0	0	3	40	60	100
Contact Classes: 48	**Total Tutorials: Nil**	**Total Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: Reinforced Concrete Structures Design and Drawing								

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:

After successful completion of the course, students should be able to:

CO 1	Discuss the planning and functional requirements of Industrial structures.
CO 2	Discover the need to learn about the design concepts, and constructional aspects of Industrial structures
CO 3	Analyze and evaluate the importance of various construction materials for Industrial constructions
CO 4	Design portal frames, tower cranes and bracing system in Industrial buildings.
CO 5	Analyze and design various structural elements in water tanks
CO 6	Analyze and design structural elements used in pre-cast construction including fabrication, erection and installation

IV. COURSE CONTENT:

MODULE-I: STEEL GANTRY GIRDERS (10)

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.

MODULE-II: PORTAL FRAMES (09)

Design of portal frame with hinge base, design of portal frame with fixed base -Gable Structures – Lightweight Structures

MODULE-III: PILE FOUNDATIONS (10)
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.

MODULE-IV: CHIMNEYS (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

MODULE-V: WATER TANKS, DESIGN OF PRESSED STEEL WATER TANK (10)
Design of stays: Joints, Design of hemispherical bottom water tank, side plates, Bottom plates, joints, Ring girder: Design of staging and foundation.

V. TEXT BOOKS:

1. Punmia B. C., Jain Ashok Kr., Jain Arun Kr, "Design of Steel Structure", Lakshmi Publishers, 2nd edition,1998.

VI. REFERENCE BOOKS:

1. Ram Chandra, "Design of Steel Structures', Standard Publishers, 12th edition, 2009.
2. Subramaniyam., "Design of Steel Structures", Oxford University Press, 2016.

VII. ELECTRONICS RESOURCES:

1. http://nptel.ac.in/courses/105106113/3
2. http://nptel.ac.in/downloads/105106113/

VIII. MATERIALS ONLINE:

1. Course Template
2. Tutorial Question Bank
3. Assignments
4. Model Question Paper – I
5. Model Question Paper - II
6. Lecture Notes
7. Power point presentation