INDUSTRIAL STRUCTURES

(Elective – I)

Course Code: 13CE 2104

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Course Educational Objectives: :

1. To impart the knowledge on planning and functional requirement of industrial structures
2. To familiarize the student with prefabrication and construction techniques of industrial structures

Course Outcomes:

1. The students will demonstrate the ability to learn design and constructional aspects of industrial structures
2. To impart the students, with the knowledge of planning and functional requirements of industrial structures.
3. To impart the students, with the knowledge of Loads on Industrial structures
4. To impart the students, with the knowledge of Tower cranes and Transmission line and Communication towers.

UNIT –I

PLANNING AND FUNCTIONAL REQUIREMENTS: Classification of Industrial structures - Choice of site - General requirements of different types of industries for safety, space requirements, services and landplaning for Layout Requirements regarding Lighting, Ventilation and Fire Safety - Protection against noise and vibration - Guidelines from Factories Act. Codes of practice in the design and construction

MATERIALS: Properties of Concrete, Steel, R.C.C, Prestressed Concrete, Aluminum, PVC that affect the structural performance – relative merits and demerits – suitability as construction material in Industrial Structures.

UNIT- II

LOADS ON INDUSTRIAL BUILDINGS, VARIOUS CONFIGURATIONS - Loads on Industrial structures – Gravity load, Live load, wind load and Earthquake load - Configuration of various Industrial buildings, Need for large column free areas - Various types of Floors, Roofs and Roof coverings.

UNIT-III

STEEL PORTAL FRAMES: Introduction to Plastic Analysis - Shape factor – Plastic moment carrying capacity of simple beams and portal frames – Design of steel portal frames with and without Gantry girders.

UNIT –IV

STEEL TRUSS: Tower Cranes and Transmission line and Communication towers. Analysis and design of bracing systems in industrial sheds.

UNIT- V

PREFABRICATION AND CONSTRUCTION TECHNIQUES: Pre-casting techniques - Planning, Analysis and design considerations suitability for Industrial structures. Handling techniques – Transportation, Storage and erection of structures. Test on precast elements - Quality control - Repairs and economical aspects on prefabrication.

TEXTBOOKS

1. Duggal, S.K., Design of Steel Structures Tata McGraw-Hill Publications, 3rd Edition, 2006.

2. Krishna Raju N. "Advanced Reinforced Concrete Design", CBS Publishers, 2nd Edition, 2006.

REFERENCES

1. *"Teaching Resource for Structural Steel Design"* – INSDAG, Kolkatta, 2008.

3. IS: 456 – 2000, IS: 800 – 2007, IS: 875 – 1964, BIS, New Delhi.

4. *"Large Panel Prefabricated Constructions, Proc. of Advance Course"* by SERC, Madras, 2004.

5. *"National Building Code*", BIS, New Delhi, 2005.

6. Subrahmanyam, N., *"Space Structures",* Wheeler & Co., Allahabad, 1st Edition, 1999.