INDUSTRIAL STRUCTURES

Course Code: 15CE2104

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Course Outcomes: At the end of the course the student will be able to

CO1: Discuss the planning and functional requirements of Industrial structures.

CO2: Discover the need to learn about the design concepts, and constructional aspects of Industrial structures.

CO3: Analyse and evaluate the importance of various construction materials for Industrial constructions.

CO4: Design portal frames, tower cranes and bracing system in Industrial buildings.

CO5: Analyse and design structural elements used in pre-cast construction including fabrication, erection and installation.

UNIT –I (10-Lectures)

PLANNING AND FUNCTIONAL REQUIREMENTS:
Classification of Industrial structures - General requirements of different types of industries for safety, services and land planning 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 Steel, R.C.C, Prestressed Concrete, which affects the structural performance – relative merits and demerits.

UNIT- II (10-Lectures)

LOADS ON INDUSTRIAL BUILDINGS, AND 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.

UNIT-III (10-Lectures)

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 gantry girders.

UNIT–IV (10-Lectures)

STEEL TRUSS: Analysis and design of bracing systems in industrial sheds and towers.

UNIT-V (10-Lectures)

PRE FABRICATION AND CONSTRUCTION TECHNIQUES:

Pre-casting techniques - Planning, analysis and design considerations suitability for Industrial structures - Handling techniques – Transportation, storage and erection of structures -Tests on precast elements - Quality control - Repairs and economical aspects on prefabrication.

TEXTBOOKS

1. Duggal, S.K., *"Design of Steel Structures"*, 3rd Edition, Tata McGraw-Hill Publications, 2006.
2. Krishna Raju N. *"Advanced Reinforced Concrete Design"*, 2nd Edition, CBS Publishers, 2006

REFERENCES

1. *"Teaching Resource for Structural Steel Design"* –INSDAG, Kolkata, 2008
2. IS: 456 – 2000, IS: 800 – 2007, IS: 875 – 1964, BIS, New Delhi
3. "Large Panel Prefabricated Constructions", Proc. of Advance Course by SERC, Madras, 2004.
4. "National Building Code", BIS, New Delhi, 2005.
5. Subrahmanyam, N., "Space Structures", 1st Edition, Wheeler & Co., Allahabad, 1999.