ADVANCED DESIGN OF STEEL STRUCTURES
(Professional Elective- V)

Course Code: 15CE1150

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Pre-requisites:

Structural analysis – I & II, Design of Steel Structures.

Course Outcomes:

At the end of the Course, the Student will be able to:

CO 1 Understand the concept of beam column and design a beam column.

CO 2 Design a Plate girders including stiffeners

CO 3 Analyse and design a Gantry girder for a given capacity

CO 4 Analyse and design of Industrial Truss and it's component members

CO 5 Design a Pre-engineered building.

UNIT- I **(10 Lectures)**

DESIGN OF BEAM-COLUMNS

Introduction – General behavior of beam-columns – codal provision for local capacity check and overall buckling check – Design of beam-columns.

UNIT – II **(10 Lectures)**

DESIGN OF PLATE GIRDER

Introduction to plate girder – Elements of plate girder– IS code recommendations- Preliminary design considerations - concept of tension field action – design of end panels. Design of plate girder using IS 800-2007- Design of vertical stiffeners – design of longitudinal stiffeners – design of torsional stiffeners – Introduction to steel plate shear wall.

UNIT – III (10 Lectures)

DESIGN OF GANTRY GIRDER

Introduction - Loading consideration – Maximum load effect – Selection of gantry girder – Design of gantry girders for primary loads only.

UNIT – IV (10 Lectures)

DESIGN OF INDUSTRIAL BUILDING

Introduction to roof truss – Different types of trusses - Design loads – Load combinations as per IS code recommendations - Design of simple roof trusses involving the design of purlins, and other members

UNIT- V (10 Lectures)

PRE-ENGINEERED BUILDINGS

Introduction – connection details – design of typical portal frame from industrial shed using pre fabricated elements

TEXT BOOKS :

1. Limit state design in Structural Steel by M.R. Sheyekar, 1stediction, PHI publications, 2010.
2. N.Subramanyam, Design of Steel Structures by, Oxford University press 1st edition, , 2008.
3. S.K. Duggal, Limit state design of steel structures, TMH, 1st Edition, 2014.

REFERENCES :

Design of steel structures by Edmin H. Gaylord, J. Charles. N. Gaylord & James E. Stallmeyer, Mc. Graw – Hill International 3rd Edition, 1992.