Course Number and Name

BCE404 - BASIC STRUCTURAL DESIGN

Credits and Contact Hours

4 & 60

Course Coordinator's Name

Ms.T.Aarthiharini

Text Books and References

TEXT BOOKS:

1. Ramachandra S. Design of steel Structures, Vol I & II, Standard Publications, New Delhi 1982

REFERENCES:

1. Arya.A.S. & Ajmani. IL "Design of Steel Structures". Nem Chand Bros., Roorkee (UP), 1992
2. Dayaratnam.P, "Design of Steel Structures", Wheelers Publishing Co.Ltd, 2008
3. Duggal, Design of Steel Structures, Tata McGrew Hill Co.II Edition,1991
4. Vazirani V.N. and Ratwani M.M. : Steel Structures , Khanna Publications, New Delhi,1976

Note: The relevant BIS Codes for the design of masonry (I.S.1905) Timber (LS883) and Steel Structures (IS 800) are permitted in the University Examinations. Steel Tables are also permitted in the University Examinations

Course Description

- To introduce the students to limit state design of structural steel members subjected to compressive, tensile and bending loads, including connections.
- Design of structural systems such as roof trusses, purlins as per provisions of current code (IS 800 - 2007) of practice

Prerequisites	Co-requisites
Basic Mechanical Engineering	NIL

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)

CO1	To study about different materials used in masonry
CO2	To analyse the steel structures.
CO3	To design of trusses and their members.
CO4	To carry out the analysis of simple beams
CO5	To study about different loading conditions on trusses

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	L		H	M							
CO2	L		H	M							

CO3	L		H	M								
CO4	L		H	M								
CO5	L		H	M								

List of Topics Covered

UNIT I MASONRY **12**

Strength of bricks and masonry – Design of walls – Pillars and roofing as per the latest BIS codes. Timber Structures – Properties and strength of timber used in constructions – permissible stresses in timber – design of joints, using bolts, and metal connections – design of tension and compression members – beams in bending.

UNIT II STEEL STRUCTURES **12**

Introduction – properties of Indian standard rolled steel sections – types of loads, permissible stresses in tension, compression and shear as per BIS Code - Riveted and Bolted connections – Permissible stresses for various types of rivets and bolts -Efficiency of a joint - types of failures of riveted Joint - design of riveted and bolted connections for members subjected to axial forces - design of eccentrically loaded connections.

UNIT III TENSION MEMBERS **12**

Design of simple and compound steel sections subjected to tension- tension splice-Compression Members - Maximum slenderness ratio for different types of compression members – Design of simple and compound sections to resist compressive loads – design of battens and lacings – design of column base and connections – column splicings.

UNIT IV BEAMS **12**

Design of simple beams- strength and stiffness criteria – design of built up beams – curtailment of flange plates – connections between flange and web- need for lateral support for compression flange and their design – web strength of beams in shear – design of grillage foundation

UNIT V ROOF TRUSSES **12**

Types of roof trusses for different spans - design of pitched roof trusses for dead, live and wind loads - Design of joints, Design of supports and bearings – design of purlins.