Course Number and Name
BCE702 - COMPUTER AIDED DESIGN OF STRUCTURES
Credits and Contact Hours
4 & 60
Course Coordinator's Name
Mr.K.Sathishkumar
Text Books and References

TEXT BOOKS:

1. Krishna Raju, "Structural Design & Drawing (Concrete & Steel)", CBS Publishers 2004.

REFERENCES:

1. Punmia, B.C., Ashok Kumar Jain, Arun Kumar Jain, "Design of steel structures", Lakshmi Publications Pvt. Ltd 2003.
2. Rajasekaran, S., Finite Element Analysis. AH Wheelers Publishing Company Ltd.,
3. Rao S.S.Optimization – Theory and Application, Wiley Eastern Ltd.
4. Auto CADD manual.

Course Description

- To introduce the students about computer graphics, structural analysis, design and optimization and expert systems, applications in analysis.

Prerequisites	Co-requisites
Computer Aided Building Drawing	NIL

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

Course Outcomes (COs)	
CO1	Prepare wire frame modeling and solid modeling using drafting packages
CO2	Perform structural analysis using computer packages
CO3	Prepare algorithms for the analysis and design of steel and RC structures
CO4	Analysis simple structures using expert systems
CO5	Analysis and design of structures by using STADD.PRO, STRAP

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

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	H		H	H	H						
CO2			H	H	H						
CO3			H	H						M	
CO4			H	H	H		L				
CO5			H	H	H						

List of Topics Covered

UNIT I   INTRODUCTION & COMPUTER GRAPHICS   10

Introduction to computer graphics - Fundamentals of CAD – Hardware and software requirements – Design process – Applications and benefits – drafting packages- use of AUTOCAD – application to layout of buildings and structures - graphic primitives – wireframe modeling and solid modeling.

UNIT II   DESIGN & OPTIMIZATION   12

Design and Optimization: Optimization techniques – principles of design of steel and RCC structures - applications to simple design problems.

UNIT III   INTRODUCTION TO FINITE ELEMENT ANALYSIS   14

Introduction of Finite Element Analysis: Fundamentals of finite element analysis – steps involved - boundary value problems. Galerkin's approach – variation principles – finite element matrix - assemblage solution for deflections - stresses and strains - simple problems using triangular elements.

UNIT IV   ANALYSIS OF STRUCTURES BY FINITE ELEMENT METHOD   12

Analysis of Structures by FEM: Analysis of plane truss, space truss, plane frame and space frame by using FEM packages – ANSYS – STRUDL – NASTRAN – SAP 2000.

UNIT V   STRUCTURAL ENGINEERING PACKAGES   12

Structural Engineering Packages: Introduction of various structural engineering packages -analysis and design of structures by using STADD.PRO, STRAP.