ST5017 COMPUTER AIDED ANALYSIS AND DESIGN

DETAILED SYLLABUS

OBJECTIVES

To learn the principles of computer graphics, structural analysis, structural design, Finite Element Analysis, Optimization and Artificial Intelligence supported by software tools.

UNIT I COMPUTER GRAPHICS

Graphic primitives – Transformations – Basics of 2D drafting – Modelling of curves and surfaces – Wire frame modelling – Solid Modelling - Graphic standards - Drafting Software packages.

UNIT II STRUCTURAL ANALYSIS

Computer method of structural analysis – Simulation and Analysis of steel sections I, channel and Angle –PEB Elements – RCC and Composite members - Nonlinear Analysis through software packages.

UNIT III STRUCTURAL DESIGN

Computer Aided Design of Steel and RC structural elements – Detailing of reinforcement – Detailed Drawing.

UNIT IV OPTIMIZATION

Introduction to Optimization – Applications of Linear programming – Simplex Algorithm – Post Optimality Analysis – Project scheduling – CPM and PERT Applications.

UNIT V ARTIFICIAL INTELLIGENCE

Introduction – Heuristic Research – Knowledge based Expert Systems – Architecture and Applications – Rules and Decision tables – Inference Mechanisms – Simple Applications – Genetic Algorithm and Applications – Principles of Neural Network – Expert system shells.

REFERENCES

1. Krishnamoorthy C.S and Rajeev S., “Computer Aided Design”, Narosa Publishing House, New Delhi, 1991.
2. Groover M.P. and Zimmers E.W. Jr.," CAD/CAM, Computer Aided Design and Manufacturing", Prentice Hall of India Ltd, New Delhi, 1993.
3. Harrison H.B., “Structural Analysis and Design Vol.I and II”, Pergamon Press, 1991

4. Rao. S.S., "Optimisation Theory and Applications ", Wiley Eastern Limited, New Delhi, 2009.
5. Richard Forsyth (Ed.), “Expert System Principles and Case Studies”, Chapman and Hall, 1996.
6. Shah V.L. “Computer Aided Design in Reinforced Concrete” Structural Publishers, 2014.