

SREENIVASA INSTITUTE of TECHNOLOGY and MANAGEMENT STUDIES

II MCA - I Semester	L	P	C
	4	0	4

16HAS214 COMPUTER ORIENTED OPERATIONS RESEARCH

Course Objectives:

- To provide ability to understand and analyze managerial problems in industry so that they are able to use resources (capitals, materials, staffing, and machines) more effectively;
- Knowledge of formulating mathematical models for quantitative analysis of managerial problems in industry;
- Skills in the use of Operations Research approaches and computer tools in solving real problems in industry; mathematical models for analysis of real problems in Operations Research

Syllabus:

UNIT I : Basics of operation research and Linear Programming

Definition of O.R, necessity of operations research, scope of O.R, Phases of O.R, Models in O.R.

Introduction, mathematical formulation of LPP, Graphical Solution of LPP , Simplex Method, Artificial variable techniques, Degeneracy and cycling.

Duality theorems and its applications, Dual Simplex Method.

UNIT II : Transportation Problem and Assignment Models

Introduction, Mathematical Formulation, Methods for Finding Initial basic feasible solutions ,Optimum Solution of a Transportation Problems, Degeneracy in Transportation Problems, Unbalanced Transportation Problems, Maximization in Transportation Problems.

Introduction and formulation , Hungarian Assignment Algorithm, Variations of the Assignment Problem and Travelling Salesman Problem.

UNIT III: Game theory and Sequencing Models

Introduction and some basic terminologies, two – person zero – sum game, Solution methods of games without saddle point.

Introduction and basic assumption, Processing n jobs through two machines, processing of n jobs three machines and m machines, Processing two jobs on n machines.

UNIT IV : Replacement Models, Inventory Models and EOQ Models

Introduction, Replacement of items that deteriorate with time, Group Replacement Policy.

Introduction, Cost involved in inventory problems.

Purchasing problem with no shortages, Production problem with no shortages, Purchasing problem with Shortages & Production problem with Shortages.

UNIT V : Scheduling by PERT and CPM

Introduction, Network Constructions, Rules of network constructions , Fulkerson's Role of numbering events , Critical Path Method (CPM),and PERT procedure with problems, Resource analysis in network scheduling.

Course Outcomes

- Recognize the importance and value of Operations Research and mathematical modeling in solving practical problems in industry;
- Formulate a managerial decision problem into a mathematical model;
- Understand Operations Research models and apply them to real-life problems;
- Use computer tools to solve a mathematical model for a practical problem.

TEXT BOOKS

1. Operations Research, 2005 A.M. Natarajan, P. Balasubramani, A. Tamilarasi, Pearson Education, New Delhi.
2. Operations Research, 2009, P Sankara Iyer , Tata McGraw-hill, New Delhi.

REFERENCE BOOKS

1. Operations Research , 2007, S.D Sharma , Kedar Nath Ram Nath & Co, Meerut.
2. Operations Research , 2/e, 2007, R. Panneeselvam , Pentice Hall of India (PHI), New Delhi.
3. Operation Research – Theory & Applications, 4/e, 2009, J.K. Sharma, Macmillan India Ltd, New Delhi.
4. Operation Research, 13/e, 2007, Kanti Swarup, P.K.Gupta, Man Mohan, Sultan Chand & Sons, New Delhi.
5. Operation Research, 8/e, 2007, Hadmy A, Taha, Pearson Education, New Delhi.

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