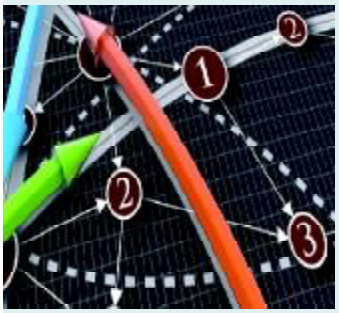

16CS308 OPERATIONS RESEARCH FOR COMPUTER SCIENCE ENGINEERS

Hours Per Week :

L	T	P	C
3	1	-	4

Total Hours :

L	T	P
45	15	-

CS	WA/RA	SSH	SA	S	BS
5	5	40	-	-	-

Course Description and Objectives:

This course introduces mathematical, analytical and computational techniques to provide quantitative and qualitative information that help to improve the managerial decision making process. The objective of this course is to enable the student to understand and analyze managerial and engineering problems to equip him to use the resources such as capitals, materials, productions, controlling, directing, staffing, and machines more effectively.

Course Outcomes:

The student will be able to:

- recognize the importance and value of Operations Research (OR) and mathematical modeling in solving practical problems in industry.
- formulate a managerial decision making problem into a mathematical model.
- understand Operations Research models and apply them to real life problems.
- use OR tools to solve practical problem by finding solutions to its mathematical model.

SKILLS:

- ü Solve Maximum Flow problem.
- ü Expertise in the usage of OR approaches and computer tools in solving real problems in industry.
- ü Familiarization with mathematical tools that are needed to solve optimization problems.
- ü Build and solve simplex, dynamic, game theory and transportation problems.
- ü Develop more effective queueing methods.

UNIT - 1 **L-09**

INTRODUCTION: Nature & Meaning of OR, Management applications of OR, Characteristics of operations research, Scope of operations research, Role of computers in Operations Research, Computational procedure of simplex method, Two phase method, Big-M Method, Methods to resolve degeneracy, Solution of simultaneous equations by simplex method.

UNIT - 2 **L-09**

TRANSPOTATION PROBLEM: Introduction, Mathematical formulation of transportation problem, Types of transportation problem, Basic feasible solution by northwest corner method, Least cost entry method, Vogel's approximation method, U-V Method.

UNIT - 3 **L-09**

ASSIGNMENT PROBLE: Introduction, Zero one programming model for assignment problem, Types of assignment problem, Hungarian method, Branch and Bound technique for assignment problem.

UNIT - 4 **L-09**

GAME THEORY: Introduction, Characteristics of Game theory, Basic Definitions, Minimax(Maximin) criterion and optimal strategy, Saddle point, Optimal strategies and value of the game, Solution of games without saddle points, Rectangular games without saddle point, Equivalence of rectangular game and linear programming, 2 ×2 games without saddle points, Arithmetic Methods for 2 ×2 games, Principle of dominance to reduce size of the game

UNIT - 5 **L-09**

NETWORK TECHNIQUES: Introduction, Shortest path model, Minimum spanning tree problem, Maximum flow problem.

TEXT BOOKS:

1. R.Panneer selvam, "Operations Research", 2nd edition, Prentice-Hall of India Private Limited , 2006. (II, III, V Units).
2. S.D.Sarma, "Operations Research Theory Methods & Applications", 4th edition, Kedarnath Ramnath & co, Meerut, 2009. (I,IV Units).

REFERENCE BOOKS:

1. J.C.Pant, "Introduction to Operations Research", 1st edition, Jain Brothers, 2006.
2. Kanti Swarup, Man Mohan and P.K.Gupta, "Introduction to Operations Research", 5th edition, S Chand & Sons, 2008.

ACTIVITIES:

- *Solving simultaneous equations by simplex method.*
- *Applying simulation methods on LP problems..*
- *Finding Minimal Spanning trees.*
- *Solution of games with and with out saddle points.*
- *Soliving Maximum flow problems.*
- *Solving transportation and assignment problems.*