MBA Program

Year: I, Semester II

OPERATIONS RESEARCH

Subject Code- NMA 508 **L T P C 3 1 0 4**

Course Objectives:

1. To understand the importance of the use of OR application in decision Making environment
2. To formulate LPP and Acquire General idea of the Simplex method.
3. To understand and solve transportation & assignment models.
4. To know optimal sequence model and understand concepts of queuing theory.
5. To identify right time for replacement of equipment and understand project management techniques.

SYLLABUS

UNIT I - Operations Research & Decision Making Environments

Operations Research: Uses, Scope and Applications of Operations Research in managerial decision making.

Decision-making environments: Decision-making under certainty, uncertainty and risk situations, Decision tree approach and its applications.

UNIT II - Linear Programming Problem & Transportation Problem

Linear programming: Mathematical formulations of LP Models for product-mix problems, graphical and simplex method of solving LP problems, duality.

Transportation problem: Various methods of finding Initial basic feasible solution-North West Corner Method, Least Cost Method & VAM Method and optimal solution-Stepping Stone & MODI Method.

UNIT III - Assignment model & Game Theory

Assignment model: Hungarian Algorithm and its applications, Maximization Assignment Problem.

Game Theory: Concept of game, Two-person zero-sum game, Pure and Mixed Strategy Games, Saddle Point, Odds Method; Dominance Method and Graphical Method for solving Mixed Strategy Game.

UNIT IV - Sequencing & Queuing Theory

Sequencing Problem: Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, Two jobs and m - Machines Problems.

Queuing Theory: Characteristics of M/M/I Queue model, Applications of Poisson and Exponential distributions in estimating arrival rate and service rate.

UNIT V - Replacement Problem & Project Management

Replacement Problem: Replacement of assets that deteriorate with time, replacement

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Dr. Ram Autar
Professor And Head, Deptt. of Maths
School of Basic and Applied Sciences
HBTU, Nawabganj, Kanpur-208002

of assets which fail suddenly.
Project Management: Rules for drawing the network diagram, Applications of CPM and PERT techniques in Project planning and controlling, crashing of operations.

Suggested Readings:

1. R. Panneerselvam - Operations Research (PHI, 2nd Edition)
2. Sharma J K - Operations Research (Pearson, 3rd Edition
3. Apte-Operation Research and Quantitative Techniques (Excel Books)
4. S Kalawathy-Operation Research (Vikas IVth Edition)
5. Natarajan- Operation Research(Pearson)
6. Singh & Kumar—Operation Research(UDH Publisher edition 2013)
7. Taha Hamdy - Operations Research - An Introduction (Prentice-Hall, 9th edition)
8. Vohra - Quantitative Techniques in Management (Tata McGraw-Hill, 2nd)

Course Outcomes

CO1-Be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.
CO2-To formulate linear programming problem and to find optimal solution by graphical and simplex method and be able to build and solve Transportation Models.
CO3-Be able to build and solve Assignment Models also to solve game theory problems by understanding pure and mix strategies.
CO4-To assign optimal sequence of different jobs on different machines and develop understanding of queuing theory concepts.
CO5-To implement replacement of equipments at right time and able to implement project management concepts like CPM, PERT to reduce cost and time.

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Dr. Ram Autar
Professor And Head, Deptt. of Maths
School of Basic and Applied Sciences
HBTU, Nawabganj, Kanpur-208002