

Major Elective – 1

(Group – 2)

Decision Models in Management

Course Objectives:

1. To give the concepts of quantitative methods for management decision and subsequently their applications in transportation engineering.
2. To provide the basic understanding of simulation process and its applications in transportation engineering.
3. To make students conversant with shortest path method.

Course Contents:

1. Introduction: Quantitative methods for management decisions. Operation research. Decision environment, Decision making processes.
2. Linear programming problems, graphical solution, non linear programming. Heuristics, Simplex method, duality, post- optimality analysis; Primal and dual solution approaches; Sensitivity analysis, Unconstrained and constrained optimization, Kuhn- Tucker theory; Quadratic programming applications.
3. Transportation and transshipment problems.
4. Assignment problems.
5. Queuing theory, Queuing Models, Markov decision processes; Applications to inventory management and Replacement processes.
6. Discrete event simulation; Generation of random variables, simulation processes and languages.
7. Network models. Shortest path method, maximum flow. Minimum spanning tree problem.
8. Integer programming, goal programming, dynamic programming. Decision theory. Role of knowledge; Deterministic and probabilistic situation, Single and multiple person decision making.

Tutorials:

1. Problems based on linear programming, Simplex method and its varieties.
2. Problems based on Non-linear programming.
3. Solving Transportation, Transshipment and Assignment problems.
4. Problems based on simulation.
5. Problems based on shortest path method and minimum spanning tree.
6. Problems based on Integer, goal, dynamic programming.
7. Computer applications for solving above problems.

References :

1. Rao S.S., *Engineering Optimisation - Theory & Practice*, New Age International Publishers, Revised Edition III, 2006.
2. N.D.Vohra. *Quantitative techniques in management*, TMH, New Delhi, ISBN-0-07-451979-4
3. Deightler, philips, wilde (phi), *Foundations of optimization*
4. Ravindran, D.T.Philips and J.J.Solberg, *Operations Research; Principles and Practice*, John Wiley, 2nd Edition 1987
5. S.Bazzarra, J.J.Jarvis and H.D.Sherali, *Linear Programming and Network Flows*, 2nd Edition , John Wiley, 1990
6. L.Winston, *Operations Research; Application and Algorithms*, Kent P.W.S. 2nd Edition, 1991
7. A.Taha, *Operations Research; An Introduction*, MacMillan, 1982
8. Kapoor, *Computer Assisted Decision Models*, Tata McGrw-Hill, New Delhi, 1991