

Quantitative Techniques

Course Code: CUSCOM103CR

Max Marks: 100

M.Com : 1st Semester

Continuous Internal Assessment: 20

Course Type: Core

Module - I

Management, Decision making and Theory of Games: decision making and quantitative techniques, historical development of Operations Research (OR), nature and characteristic features of OR, methodology of OR. Theory of games, the game model, two-person zero-sum game, when no saddle point exists, solution of $2 \times n$ and $m \times 2$ games using graphical method, limitations of the theory of games.

Module - II

Linear programming: requirements, assumptions, formulation of linear programming problems, the maximization and minimization cases, graphic method, simplex method, duality and post optimality analysis. Transportation problems – north-west corner rule, Vogel's approximation method, stepping stone method, the modified distribution method, unbalanced transportation problems, degeneracy. Assignment problems - the maximization type. The assignment problems, Hungarian method, constrained assignment problems, unbalanced assignment problems, maximization cases, Travelling salesman problem.

Module - III

PERT/ CPM networks and Simulation: rules of network construction, Scheduling a network: Earliest and Latest times, determination of float, PERT with probability distribution, Crashing: time-cost trade-off. Simulation--process, Monte-Carlo simulation, simulation of inventory system, simulation of queuing system, advantages and disadvantages.

Module - IV

Decision theory and Sequencing: Decision theory – pay off table, opportunity loss table, decision under uncertainty, Laplace principle, maximin principle, maximax principle, Hurvics principle, and Savage principle. Decision making under risk – maximum likelihood principle, expected principle, expected opportunity loss, expected pay off of the perfect information, utility as a basis of decision criterion. Sequencing: assumptions, algorithm for solving sequencing problems, processing n jobs through 2 and 3 machines only. Gantt charts.

1. Berry Render; Ralph M Stair Jr. Michael E. Hanna *Quantitative Analysis for Management*, Prentice Hall of India Pvt. Ltd. New Delhi.
2. N D Vohra, *Quantitative Techniques in Management*, Tata McGraw Hill Publishing Company.
3. Richard I Levin; David S Rubin Joel P Stinson; Everette S Gardner Jr. *Quantitative Approaches to Management*, McGraw Hill, International Edition.
4. A M Natrajan; P Balasubramani; A Tamilarasi, *Operations Research*, Pearson Education, New Delhi.
5. P C Tulsian and Vishal Pandey, *Quantitative Techniques*, Pearson education, New Delhi.
6. M P Gupta and B R Khanna, *Quantitative Techniques for Decision Making*, Prentice Hall of India Pvt . Ltd. New Delhi.

Journals:

1. International Journal of Operations and Quantitative Management
 2. International Journal of Operations Research and Management Science
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