

MANGALORE UNIVERSITY
Department of Commerce
M.Com.

CMH405: MANAGEMENT SCIENCE

Work load: 3 hours lecture and 2 hours tutorial per week: total 4 credits

Learning Objective:

- To provide an understanding of Management Science techniques used for managerial decision making.

Course Outcomes:

1. Enables the students to get exposure to the basic concepts and theories and the application of various management science techniques in making business problems.

Unit -1: Introduction: History, Nature, Management Science and Systems Approach, Quantitative Analysis: Model Development; Data Preparation; Model Solution; Report Generation, Phases, Management Science Techniques, Significance of Management Science in Business and Industry, Management Science and Functional Areas of Management, Limitations.

Unit -2: Linear Programming Problem (LPP): Basic Concepts, Model Formulation, Assumptions underlying Linear Programming, Examples on the Applications of LPP, Graphical Method for Solution of LPP, Canonical and Standard Forms of LPP, Simplex Algorithm for Solution of Maximisation and Minimisation LPP : Big-M Method and Two- Phase Method, A Few Special Issues in Linear Programming: Infeasibility; Unboundedness; Redundancy; Alternate Optional Solutions; Degeneracy, Duality in Linear Programming: Construction of a Dual Problem; Shadow Price; The Importance of the Duality Concept; Important Results in Duality.

Unit -3: Transportation Problem: Basic Concepts, Mathematical Model, Relationship to Linear Programming, The Transportation Method, Finding an Initial Feasible Solution: North- West Corner Rule; Least Cost Method, and Vogel's Approximation Method (VAM), Test for Optimality: Stepping Stone Method and the Modified Distribution (MODI) Method, Degeneracy in Transportation Problem, Unbalanced Transportation Problem, Maximisation Case in Transportation Problem.

Unit -4: Assignment Problem: Meaning, Comparison with Transportation Problem, Mathematical Representation of Assignment Model, Formulation of Assignment Model, Hungarian Method for Solution of Assignment Model, Special Cases in Assignment Problems: Maximisation Case; Multiple Optional Solution; Unbalanced Problem; Constrained Assignment Problem.

Unit -5: Network Based Project Scheduling Techniques: Terminologies, Common Errors, Rules for Drawing Network Diagrams, Numbering of Events by Fulkerson's Rule, Critical Path Method (CPM): Characteristics of Critical Path; Finding Critical Path in Large Network Using Forward Pass Computation and Backward Pass Computation; Significance of Critical Path; Slack Time and Critical Path; Activity Float Analysis, Programme Evaluation and Review Technique (PERT): PERT Procedure; Computation of the Variance and Standard Deviation of Activity Times for PERT; Probability Aspects of Project Completion Time, Cost Considerations in PERT/ CPM: Project Cost; Cost Slope; Time-Cost Trade-off; Crashing of Project Time.

References:

1. Aekoff Russell L. and Sasieni Maurice W: Fundamentals of Operations Research (New York: John Wiley & Sons)
2. Anderson, Sweeney and Williams: An Introduction to Management Science: Quantitative Approaches to Decision Making (Australia: Thomson South Western)
3. Dannenbring, David G and Starr, Martin K: Management Science: An Introduction (New Delhi: McGraw hill Education)
4. Gupta P.K and Hira P.S: Operations Research (New Delhi: S. Chand & Co.Ltd)
5. Kalavathy S: Operations Research (New Delhi: Vikas Publishing House)
6. Kapoor V.K: Operations Research: Problems and Solutions (New Delhi: Sultan Chand & Sons)
7. Kothari C R: Introduction to Operational Research (New Delhi: Vikas)
8. Nagarajan K: Project Management (New Delhi: New Age International)
9. Render, B and Stair, RM Jr: Quantitative Analysis for Management (Boston: Allyn & Bacon, Inc.)
10. Sharma J.K: Operations Research (Bangalore: Macmillan India Ltd.)
11. Sharma S.D: Operations Research (Meerut: Kedarnath Ramnath)
12. Taha, Hamdy A: Operations Research An Introduction (New Delhi: Prentice Hall of India Ltd.)
13. Vohra N D: Quantitative Techniques in Management (New Delhi: Tara McGraw-Hill)

