

## MASTER OF COMMERCE - SECOND SEMESTER

### OPERATIONS RESEARCH FOR BUSINESS DECISIONS

Code: **HC 2.4**

Contact Hours: 64

Credit Points: 4

Univ Code:

Work load: 4 **hours per week**

Evaluation: Continuous Internal Assessment – **30 Marks**  
Semester-End Examination – **70 Marks**

**Objective:** The aim of this course is to enable students for application of quantitative methods and techniques for analyzing business issues to take effective decisions.

**Pedagogy:** Lectures, Case analysis, Group discussion, Presentation and Assignments

**Module-1: Operations Research:** Introduction, Development, Nature and Definition, Characteristics, Phases of OR Study, Modelling in OR, Techniques of OR, OR in world and Indian Scenario.

**Module-2: Linear Programming:** Problem formulation, Techniques of LP, Graphical solutions for properly behaved LPPs, Graphical presentation for some exceptional cases, Some significant properties of LP, Lines, Hyper Planes, Convex set, Extreme Points on Convex set, Convex Combinations

**Module-3: Simplex Solutions for LP:** Introduction, Definitions and notations, Computational Procedure of Simplex Method, Artificial Variable Technique, Two-Phase Method - Simple Ways and alternative ways, Big-M Method, Problem of degeneracy, Method to resolve, the degeneracy, Alternative Optimum Solutions, Unbounded Solutions, Non-Existing feasible Solutions.

**Module-4: Transportation Models:** Introduction, Mathematical Formulation, Tabular representation, Definitions, Special Structure of transportation problems, Methods of obtaining initial basic feasible solutions, Optimum Solution, Unbalanced Transportation Problems.

**Module-5: Network Analysis (PERT and CPM):** Introduction, Historical Development of CPM/PERT Techniques, Application of PERT/CPM Techniques, Basic Steps in PERT/CPM Techniques, Network Diagram representation, Rules for constructing the network diagram, Labeling, Determination of Critical Path – PERT, Estimating activity times, Project duration and critical path, Effect of introduction of a dummy activity in a network, Probability of completion time, Optimization of project Time and cost in PERT network, Resource allocation.

#### Recommended Books

1. Hamdy A Taha, **Operations Research – An Introduction**, Prentice-Hall of India Private Limited, New Delhi.
2. Hiller F S and Leiberman G J, **Introduction to Operations Research**, Holden Day Inc.
3. Anitha H S, **Operations Research for Management**, Mangala Deep Publications, Jaipur.
4. Grass S I, **Linear Programming – Methods and Applications**, McGraw Hill Publications.
5. Gupta M P and Sharma J K, **Linear Programming for Management**, National Publishing House.
6. Dorfman R, Samuelson P A and Solow R M, **Linear Programming and Economic Analysis**, McGraw Hill Publications.

7. Levin R I and Lamone R P, **Linear Programming for Management Decisions**, Richard D Irwin Inc.
8. Loomba N P, **Linear Programming – An Introductory Analysis**, McGraw Hill Publications.
9. Sharma S D, **Operations Research**, Kedarnath and Company
10. Prem Kumar Gupta and D S Hira, **Operations Research**