

MS 153-OPERATIONS RESEARCH

Course Objective:

This course aims to enable students to use quantitative methods and techniques for effective decisions-making; model formulation and applications that are used in solving business decision problems.

Course Outcomes:

On completion of this course, learners will be able to:

1. Identify and develop operational research models from the verbal description of the real system.
2. Understand the mathematical tools that are needed to solve optimization problems. Use mathematical software to solve the proposed models.
3. Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

UNIT I: Linear programming: Origin and scope of Operations Research-Introduction-formulation of linear programming problem-general statement of linear programming problem-assumptions underlying linear programming problem-solution to linear programming problem: Graphical method-some special cases.

UNIT II: Simplex Method: Introduction-Simplex Method-Solution of Maximization problem-solution of Minimization problems: Big-M method and Two-phase method.

UNIT III: Transportation problem and Assignment problem: Transportation problem: Introduction-problem statement-solution to the transportation problem: North-west corner rule- Least cost entry method-Vogel's approximation method-MODI method. Assignment problem: Introduction-Solution to the assignment problem: Hungarian Method-some special cases.

UNIT IV: Theory of Games: Introduction-Game models-Two person zero-sum game and their solutions: Saddle point-when no saddle point exists-dominance rules-solution of $2 \times n$ and $m \times 2$ games.

UNIT V: PERT & CPM: Introduction-PERT/CPM networks-Rules of network construction-Network analysis: determination of earliest and latest times-critical path-calculation of floats-programme evaluation and review technique.

TEXT BOOK:

1. Quantitative techniques in management, N D VOHRA, Third edition, TATA
McGRAW HILL.

REFERENCE BOOKS:

1. An introduction to management science: Quantitative approach to Decision making, Anderson, Sweeney, Williams, 11th edition, CENAGE Learning.
2. Operations Research: An introduction, Hamady A. Taha, 9th edition, PEARSON.
3. Principles of Operations Research with application to managerial decisions, Wagner H.M., 2nd Ed. PHI Learning Pvt. Ltd.
4. Data Analysis, Optimization and Simulation Modeling, Albright, Zappe & Winston, 4th Ed., CENAGE Learning.