Open Elective Course-6
Semester II
MBOE203:OPERATIONS RESEARCH

Courseobjective:- The objective of the course is to introduce the basic concepts of Operations Research and its decision models to the students.

Syllabus & Detailed Contents

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Unit	Content	Hours / Weightage
Unit1:	Operations Research: History, Characteristics, Models and modelling, General Methodology to solve OR problem, Applications. Linear Programming: Applications and Model Formation; Graphical method; Simplex method; Duality in Linear Programming.	**10/25%**
Unit2:	Transportation Problem: Mathematical model of Transportation problem; Transportation Algorithm; Methods for finding initial solution: North-West corner method, Least cost method, Vogel's approximation method; Test for optimality; Steps of MODI method; Variations in transportation problems: Unbalanced supply and demand, Degeneracy and its resolution; Alternative optimal solution; Maximization of transportation problem. Assignment problems: Mathematical model of assignment problems; Hungarian method; Variations of the assignment problems: Multiple optimal solutions, maximization case; Unbalanced assignment problems	**10/25%**
Unit3:	Sequencing Problem: Processing of n jobs through two-machines, three machines, m-machines; Processing two jobs through m machines. Project Management: PERT & CPM; Network construction; Critical path analysis; Program evaluation and review technique (PERT); Project Time Cost Trade-Off; Project-crashing	**10/25%**
Unit4:	Inventory Models: Inventory cost components; EOQ; Deterministic inventory cost models: Inventory model with constant demand & Instantaneous supply, EOQ model with different rates of demand, EOQ model with gradual replenishment, Multi-item inventory control models with constraint, EOQ models with warehouse space constraint; Investment constraint; Average inventory level constraint; Number of orders constraints; Selective inventory control techniques: ABC analysis, VED analysis, FSN analysis	**10/25%**

Course Learning Outcomes (CLO)

On completion of this course, the students will be able to:

1. Understand managerial problems in industry so that they are able to use resources (capitals, materials, staffing, and machines) more effectively.
2. Apply mathematical models for formulation of managerial problems in industry.
3. Apply Operations Research approaches in solving real problems in industry.
4. Analyse the results and propose recommendations to the decision-making processes to Management.
5. Evaluate solution to real problems with the help of Operations Research models.

SUGGESTED READINGS

Text Books

1. Sharma J.K., Operations Research, SK Kataria& sons

2. Sharma S.D., Operations Research, Kedar Nath Ram Nath & Co.

Reference Books

1. Kapoor, N. D., (2006), Sultan Chand & Sons, New Delhi.

4. Taha, Operations Research, PHI