OPERATIONS RESEARCH

(Open Elective)

Course Code: 19ME21P1

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Course Outcomes:

At the end of the course, the student will be able to:

CO1: Formulate a linear programming problem for given problem and solve this problem by using Simplex techniques.

CO2: Evaluate sensitivity analysis to the given input data in order to know sensitive of the output.

CO3: Apply the concept of non-linear programming for solving the problems involving non-linear constraints and objectives.

CO4: Solve deterministic and Probabilistic inventory control models for known and unknown demand of the items.

CO5: Apply the dynamic programming to solve problems of discrete and continuous variables.

UNIT-I **(8-Lectures)**

Optimization techniques, model formulation, models, general L.R formulation, simplex techniques, sensitivity analysis, inventory control models

Learning outcomes:

1. Classify different optimization techniques. (L4)

2. Build a mathematical model for a given problem. (L6)

3. Identify inventory control models for solving given problem.(L1)

UNIT-II **(8-Lectures)**

Formulation of a LPP - graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis – parametric programming

Learning outcomes:

1. Formulate a linear programming problem for given problem.(L6)

2. Use simplex method to solve LPP problem. (L3)

3. Apply sensitivity analysis to the given input data in order to know sensitive of the output. (L3)

UNIT-III **(8-Lectures)**

Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem - max flow problem - CPM/PERT

Learning outcomes:

1. Develop Kuhn tucker conditions for a solution of linear programming problems. (L6)

2. Choose a PERT technique for planning and control of time for the given project. (L5)

3. Select CPM technique for control of costs and time for the given project. (L5)

UNIT-IV **(8-Lectures)**

Scheduling and sequencing - single server and multiple server models - deterministic inventory models - probabilistic inventory control models - geometric Programming

Learning outcomes:

1. List the order of activities in the operations problem. (L1)

2. Differentiate between single server and multi-server models. (L2)

3. Classify deterministic and probabilistic inventory models. (L4)

UNIT-V **(8-Lectures)**

Competitive models, single and multi-channel problems, sequencing models, dynamic programming, flow in networks, elementary graph theory, game theory simulation

Learning outcomes:

1. Differentiate between single and multi-channel problems. (L2)

2. Select the order of jobs to be processed on the machines. (L5)

3. Judge in taking decisions for conflicting objectives. (L5)

TEXT BOOKS:

1. Kanthi Swarup, P.K. Gupta and Man Mohan, Operations Research, 14th Edition, Sultan chand and sons, New Delhi, 2008.

2. S. D. Sharma, Operations Research, Kedar Nath and Ram Nath, Meerut,2008.

References:

1. H.A. Taha, Operations Research, An Introduction, 7th Edition,PHI, 2008.

2. J.C. Pant, Introduction to Optimisation: Operations Research,7th Edition, Jain Brothers, Delhi, 2008.

3. Hitler Libermann, Operations Research, McGraw Hill Pub., 2009.

4. Pannerselvam, Operations Research, Prentice Hall of India, 2010.

5. Harvey M Wagner, Principles of Operations Research, PrenticeHall of India, 2010.