

Course Code	Course Title	C	H	I	E	T
17U4MAC4	Allied Mathematics – IV	2	4	25	75	100

Learning Objectives

- To impart Optimization Techniques.
- To make the Students become familiar with the basic Principle of LPP and enrich knowledge to formulate and solve an LPP using various methods.

Learning Outcomes

On satisfying the requirement of this course, students will have the knowledge and skills to

- Formulate the LPP for a real life Problems and give the solution for the problem using suitable optimization techniques.
- Solve LPP by using Graphical, Simplex and Big-M method.
- Find the IBFS of TP using North-west Corner Rule, Row Minima, Column Minima, Least cost Method and VAM.
- Find Optimal Solution of T Pusing Modi Method.
- Solve the Assignment and Travelling Salesman Problem using Hungarian Algorithm.
- Apply LPP in Various fields such as Science, Engineering, Industry, Business, etc.

Unit I Linear Programming Problems

Formulation of Linear Programming Problem – Mathematical Formulation of a Linear Programming Problem - Linear Programming Problem in summation Notation - Linear Programming Problem in Matrix Form – Canonical Form of a Linear Programming Problem – Standard Form of a Linear Programming Problem – Problems.

Unit II Linear Programming Problems (Continued)

Solution of Linear Programming Problem – Feasible Solution – Optimal Solution – Basic solution – Basic Feasible Solution – Graphical Method – Non Negativity Constraint – Constraint of the form $ax_1 + bx_2 (\leq, \geq) c$ where a, b are not both zero – Optimizing Objective Function – Problems.

Unit III Linear Programming Problems (Continued)

Simplex Method – Big-M Method – Problems.

Unit IV Transportation Problems

Mathematical Formulation of Transportation Problems – North-west Corner Rule- Row Minima Method- Column Minima Method- Least Cost Method – Vogel Approximation Method – MODI Method.

Unit V Assignment Problems

Mathematical Formulation of Assignment Problems – Solution to Assignment Problems (Minimization & Maximization) – Travelling Salesman Problem.

Text Book:

1. S. Arumugam and A. T. Isaac, Topics in Operations Research Linear Programming , Edition 2015, New Gamma Publishing House.

Chapters: 3(3.1 – 3.6), 4, 5.

Reference Books:

1. KantiSwarup, P.K. Gupta and Man Mohan, Operations Research, 9th Edition 2001, Sultand Chand Publication.
2. V. Sundaresen, K.S.G. Subramanian and K. Ganesan, Resource Management Techniques (Operations Research) ,New Revised Edition 2000, A.R Publications.