Course Name	Course Code	Semester	Credit
LINEAR PROGRAMMING AND GAME THEORY	MT(N)-223	VI	4

SYLLABUS

Linear Programming and Game theory

Linear Programming Problem, Convexity and Basic Feasible Solutions Formulation, Canonical and standard forms, Graphical method; Convex and polyhedral sets, Hyperplanes, Extreme points; Basic solutions, Basic Feasible Solutions, Reduction of feasible solution to basic feasible solution, Correspondence between basic feasible solutions and extreme points.

Simplex Method

Optimality criterion, Improving a basic feasible solution, Unboundedness, Unique and alternate optimal solutions; Simplex algorithm and its tableau format; Artificial variables, Two-phase method, Big-M method.

Duality

Formulation of the dual problem, Duality theorems, Complimentary slackness theorem, Economic interpretation of the dual, Dual-simplex method.

Sensitivity Analysis

Changes in the cost vector, right-hand side vector and the constraint matrix of the linear programming problem.

Applications

Transportation Problem: Definition and formulation, Methods of finding initial basic feasible solutions: Northwest-corner rule, Least- cost method, Vogel approximation method; Algorithm for obtaining optimal solution. Assignment Problem: Mathematical formulation and Hungarian method.

REFERENCE BOOKS

- Linear Programming and Network Flows" by Mokhtar S. Bazaraa, John J. Jarvis, and Hanif D. Sherali.
- "Introduction to Linear Programming" by L. N. Vaserstein.

SUGGESTED READING

- "Game Theory: An Introduction" by Steven Tadelis.
- "Games and Information: An Introduction to Game Theory" by Eric Rasmusen.
- "The Theory of Industrial Organization" by Jean Tirole.