L	T	P
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Objective of Course

- To know about the formulation of L.P.P. & its solution
- To explore the Non linear programming problem and dynamic programming
  To describe Probability and random Process
- To describe random sampling and hypothetical test
- To perceive the Z-transform techniques

Unit 1:

Concept of LPP, LPP formulation, Graphical method for solving LPP with two variables, Simplex method, Duality theory, Transportation and Assignment problems. Non Linear Programming Problems (NLPP): Introduction of NLPP, constraints and non-constraint problems of maxima and minima, constraints in the form of equations.

Unit 2:

Introduction to game theory, competitive games, finite and infinite games, two person zero sum game, pure and mixed strategies, saddle point, maximin and minimax principle, solution of a rectangular game in terms of mixed strategies, Graphical method of (2xm) and (nx2) games.

Dynamic Programming: Basic concepts, Bellman's optimality principle, dynamic programming approach in decision making problems, optimal subdivision problems.

Unit 3:

Theory of Probability: Concept of probability, Random variable, discrete probability distributions, Continuous probability distributions, Moment generating function, Probability density function, some special distributions, bi-variate distribution, Random variable, conditional distribution function, Joint probability distribution function, Marginal probability distribution, cumulative probability distribution.

Unit 4:

Testing of Hypothesis, Basic concept of estimation, concept of theory of sampling, chi-square (χ^2) distribution, t-distribution, Fisher's Z-distribution. Analysis of variance, one way and two-way classification.

Unit 5:

Z-transform and their properties, inverse Z-transform, convolution theorem, solution of difference equations by Z-transform.Basic concept of Bessel's function, Hankel transform and their properties, Parseval's theorem.

Course Outcomes

After completing this course, the students will be able to:

CO's	Description of CO's
CO1	Determine the solution of Linear and Non Linear Programming Problems
CO2	Evaluate the problems related to game theory& dynamic progamming.
CO3	Acquire the knowledge of Probability theory and Random Variable.
CO4	Analyze the test of hypothesis and Analysis of Variance.
CO5	Apply Z-transforms for engineering applications.

Recommended Books:

1. Griva, S. G. Nash and A. Sofer: Linear and Non Linear Optimization, Society for Industrial & Applied, U. S. Mathematics, 2012.
2. F. B. Hildebrand: Methods of Applied Mathematics, Prentaince Hall, 1992.
3. H. K. Dass: Advance Engineering Mathematics, S. Chand, 2018.
4. P. R. Thie and G. E. Keough: An Introduction to Linear Programming & Game Theory, Wiley India Private limited, 2008.
5. Introduction to Probability Models: S. M. Rose, Elsevier India Pvt Limited, 10th Edition 2011.