Subject Code : RNENS9

PAPER IX - MATHEMATICAL PROGRAMMING

Unit I

Formulation of Linear Programming problem – Graphical solution - Simplex procedure – method of penalty – Two – Phase technique – special cases in simplex method applications – Duality – Economic interpretation of duality – Primal Dual Computations – Dual simplex method.

Unit II

Generalized simplex Tableau in Matrix form – Efficient Computational algorithm – Deterministic Dynamic Programming

Unit III

Parametric Programming and Integer Linear Programming

Unit IV

Classical Optimization Theory

Unconstrained Problem – Necessary and Sufficient conditions, Constrained Problems – Equality (Jacobi method and Lagrangian method) and un equality constrains (Extension of Lagrangian method and Kuhn-Tucker Conditions)

Unit V

Non-Linear Programming

Unconstrained non-linear algorithms – Direct search Method and Gradient Method – Constrained algorithms – Separable, quadratic, geometric programming.

Text Books:

Hamdy A. Taha, "Operations Research", (sixth edition) Prentice – Hall of India Private Limited, New Delhi, 1997.

Unit I

Chapter 2 : Section 2.1 to 2.3
Chapter 3 : Section 3.1 to 3.5
Chapter 4 : Section 4.1 to 4.6
Chapter 7 : Section 7.6 only

Unit II

Chapter 4 : Section 4.7 only
Chapter 7 : Section 7.4, 7.5.1 and 7.5.2
Chapter 10 : Section 10.2 to 10.5

Unit III

Chapter 7 : Section 7.7
Chapter 9 : Section 9.1 to 9.3

Unit IV

Chapter 20 : Section 20.1 to 20.3 omit 20.2.2.

Unit V

Chapter 21 : Section 21.1, 21.2 omit 21.2.4, 21.2..5 and 21.2.6.

References:

1. F.S. Hiller and J.Lieberman, Introduction to Operation Research (7th Edition) Tata – McGraw Hill Publishing Company, New Delhi, 2001.
2. C. Beightler, D. Philips and B. Wilde, Foundations of Optimization (2nd Edition) Prentice Hall Pvt. Ltd., New York, 1979.
3. M.s. Bazaraa, J.J. Jarvis and H.D. Sharall, Linear Programming and Network flow, John Wiley, New York, 1990
4. S.S. Rao. Optimization Theory and Applications, Wiley Eastern Ltd., New Delhi.