20PE011 - OPTIMIZATION TECHNIQUES

UNIT – I **L- 8**

Introduction to Linear Programming: Introduction-objective function and constraints.

Examples from real world. Standard form of linear programming problem. Geometrical solution, System of linear equations. Simplex method, two phases of simplex method.

UNIT – II **L- 10**

Linear Programming: Dual simplex method, Transportation problem, Assignment problem, examples.

Nonlinear programming: Unconstrained optimization-direct methods: Powell's Method, conjugate direction, Indirect search methods: steepest descent, Newton's methods.

UNIT – III **L- 8**

Constrained optimization: Sequential linear programming, Methods of feasible directions, gradient projection method, penalty function method, Augmented Legrangian multipliers method. Kuhn-Tucker conditions.

UNIT – IV **L- 8**

Dynamic programming: Multistage decision processes, Principal of optimality, computational procedure, linear programming as a case of dynamic program. All integer and mixed integer programming, Branch and Bound method.

UNIT – V **L- 6**

Meta- Heuristic Optimization: Simulated annealing, Evolutionary Programming, Genetic Algorithm, Swarm optimization and other nature inspired algorithms.

TEXT BOOKS:

1. S.S.Rao, "Engineering Optimization", revised 3rd ed., New Age international publishers.
2. Ashok D. Bellegundu and T.R. Chandru Patla, "Optimization Concepts and Application in Engineering" Pearson Edition Asia, 2002

REFERENCES:

1. Kalyanmoy Dev, "Optimization for Engineering Design" Printice-Hallof India, 2005
2. Fred Glover, G. A. Kochenberger, "Handbook of Metaheuristics", Kluwer Academic Publishers
3. Gill Murray and Wright, "Practical Optimization", Academic Press.
4. Laurence A. Wolsey, "Integer Programming", John wiley and Sons.