EE556: Optimization Technique Lab (0-0-2-1)

Introduction to Optimization Technique:

Engineering applications of Optimization; Objective function; Constraints, optimization problems based on nature of constraints; Optimization techniques – classical and advanced techniques.

Linear Programming:

Standard form of linear programming (LP) problem; Canonical form of LP problem; Linear Programming to solve any power system optimization problem, Minimization versus maximization problems, Linear Programming to solve any power system optimization problem.

Optimization using Calculus:

Maxima, minima and saddle points; Global Optimum; Personal Optimum.

Non Linear Programming

Unconstrained optimization techniques, Direct search methods, Descent methods, 2nd order methods, constrained optimization, Direct and indirect methods; Kuhn Tucker conditions.

Dynamic Programming

Sequential optimization, PID controller tuning for any process using Classical methods.

Text Books & References
1. S S Rao, "Engineering Optimization: Theory and Practice", New Age International (P) Ltd.
2. Suresh Chandera, Jaydeva, "Numerical Optimization with Applications", Narosa publisher.
3. Edvin K P Chong, Stanislaw H Zak, "An Introduction to Optimization", John Wiley.
4. Mohan C Joshi, Kannan M Moudgalya, "Optimization Theory and Practice", Narosa publisher.

S.No.	List of Experiments
1	To study matrix operations for optimization.
2	To study Minimum, Maximum and Array Sorting
3	To study objective function for optimization problems
4	To study standard and canonical form of linear programming
5	Linear Programming Problem to solve any power system optimization problem.
6	To study direct and indirect method of optimization
7	To solve any power system optimization problem using Gradient Descent Method
8	To study one variable and multiple variables optimization function
9	To develop a control algorithm using Kuhn Tucker Method.
10	To tune PID controller for any process plant using classical methods
11	To develop Dynamic Programming Problem for power system
12	To develop Hybrid metaheuristic optimization technique for power system.
13	To develop sequential optimization for power system