EE5T6 COMPUTER AIDED OPTIMIZATION TECHNIQUES   **Credits: 4**
Lecture: 4 periods/week   **Internal assessment: 30 marks**
Tutorial: 1 period /week   **Semester end examination: 70 marks**

Objectives:
The study of Optimization Techniques emphasizes Mathematical Modeling problem solving and the effect of marginal change in parameters on the solution of the problem. Understand the need and origin of the optimization methods. Get a broad picture of the various applications of optimization methods used in engineering.

Learning outcomes :
1. After completing the course student shall be able to distinguish different computer aided optimization techniques
2. Be able to create simple architecture for evaluationary algorithms
3. Have the knowledge of applying evaluation optimization technique ti engineering applications.

UNIT I
Evolutionary Computation – Introduction - Advantages of Evolutionary Computation - Current Developments

UNIT II
Fundamentals of Genetic Algorithms – Introduction to Gas – Encoding - Fitness Function - Basic Operators

UNIT III
Evolutionary Programming – Introduction - Evolution Strategies - A Scheme for Evolutionary Programming - Common Features

UNIT IV
Fundamentals of Particle Swarm Optimization Techniques – Introduction - Background of Particle Swarm Optimization - Original PSO - Research Areas and Applications

UNIT V
Variations of Particle Swarm Optimization - Discrete PSO - Constriction Factor Approach - Hybrid PSO - Adaptive PSO - Evolutionary PSO

UNIT VI
Ant Colony Search Algorithms – Introduction - Behavior of Real Ants - The Ant System - The Ant Colony System - The Max-Min Ant System - Major Characteristics of Ant Colony Search Algorithms

UNIT VII
Tabu Search - Overview of the Tabu Search Approach - Problem Formulation - Coding and Representation - Neighborhood Structure - Characterization of the Neighborhood - Functions and Strategies in Tabu Search - Applications of Tabu Search

UNIT VIII
Simulated Annealing – Introduction - Basic Principles - Cooling Schedule - SA Algorithm for the Traveling Salesman Problem - Parallel Simulated Annealing - Applications of Simulated Annealing

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Learning Resources
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Text Books
Modern heuristic optimization techniques theory and applications to power systems – IEEE Press