MA830   MULTI-OBJECTIVE OPTIMIZATION   4-0-0-4

Objectives:

- To introduce basic concepts of Multi-Objective Optimization
- To demonstrate to the research scholars how to apply multi-objective optimization and do develop algorithms for multi-objective optimization problems.

Contents:

Single and Multi-Objective Optimization Problem- Linear and Non-linear MOOP, Convex and Non-convex MOOP, Interactive and Non-interactive approaches to MOOP, Principles of Multi-Objective Optimization - Pareto Optimal Solutions, Non-Conflicting Objectives, Dominance and Pareto-Optimality – Special Solutions, Concept of Domination, Properties of Dominance Relation, Pareto Optimality, Strong Dominance and Weak Pareto-Optimality, Non-Dominated sorting of a population, Classical Methods- Weighted Sum Method, ϵ-Constraint Method, Weighted Metric Methods, Evolutionary Algorithms, Interactive Multi-Objective Evolutionary Algorithms, Constrained Multi-Objective Evolutionary Algorithms, Parallel approaches for Multi-Objective Optimization.

Textbooks and References:

1. Kalyanmoy Deb, *Multi-Objective Optimization using Evolutionary Algorithms,* First Edition, Wiley-India Pvt Ltd 2010.
2. Jurgen Branke, Kalyanmoy Deb, Kaisa Miettinen, Roman Slowinski, *Multiobjective Optimization: Interactive and Evolutionary Approaches*, Springer 2008.
3. Kaisa M. Miettinen, *Non-Linear Multiobjective Optimization*, Springer Science & Business Media, 2012.