Course Structure

Course Code : **SM7001**

Course Title : **Optimization algorithm**

Credit Hours : **3**

Course Description

Introduction to linear algebra, optimization techniques, direct methods, simulation software's, Evolutionary algorithms, Genetic Algorithms, Particle Swarm, Basics of Game theory.

Course Objectives

The student should become acquainted with:

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Course Topics

- Introduction to linear algebra
- Overview Classical optimization techniques
- Direct methods
- Gradient methods
- Interior point
- Overview on different simulation software
- over view Advanced Optimization Techniques
- Midterm exam
- Simulated Annealing
- Evolutionary algorithms: Genetic Algorithms 1
- Evolutionary algorithms: Genetic Algorithms 2
- Evolutionary algorithms: Particle Swarm 1
- Evolutionary algorithms: Particle Swarm 2
- Basics of Game theory
- Case Study
- Final Exam

References

- **Making Hard Decisions with Decision Tools:** R.T. Clemen & T. Reilly 2001 Duxbury Press
- **Decision Analysis for Management Judgement:** P. Goodwin & G. Wright 2003 John Wiley and Sons
- **Multiple Criteria Decision Analysis:** Belton, V. & T. Stewart 2002 Kluwer Academic Publishers
- **Smart Choices: A Practical Guide to Making Better Decisions:** J.S. Hammond, R.L. Keeney & H. Raiffa 1998 Harvard Business School Press
- **Rational Analysis for a Problematic World Revisited: Problem Structuring Methods for Complexity, Uncertainty and Conflict:** J. Rosenhead, J. Mingers 2001 John Wiley & Sons
- **Value-Focused Thinking: A Path to Creative Decisionmaking:** R.L. Keeney 1992 Harvard University Press