MA651   Optimization Techniques

Credit: 3-0-0-0   Approval: Approved in 2nd Senate

Prerequisites: Consent of the faculty member

Students intended for: M.S./Ph.D.

Elective or core: Elective   Semester: Odd/Even: Even

Course Outline:

Convex sets and function, Introduction to optimization, Model formulation, Simplex based techniques, Concept of duality.   [6 hours]

Quadratic Programming Problem, Geometric Programming, Separable Programming.
                                                                    [10 hours]

Direct and Gradient based search techniques for single and multi variable unconstrained optimization problems.   [12 hours]

Penalty and barrier function based techniques for constrained optimization problems.
                                                                    [6 hours]

Evolutionary Optimization Techniques, Engineering application of Optimization techniques.
                                                                    [6 hours]

Text & Reference Books:

- Mokhtar S. Bazaaraa, Hanif D. Shirali and M.C.Shetty, *"Nonlinear Programming, Theory and Algorithms"*, John Wiley & Sons, New York (2004).

- S. S. Rao, *"Engineering Optimization: Theory and Practice"*, 4th Edition, John Wiley & Sons (2009).

- Kwang Y. Lee, Mohamed A. El-Sharkawi, *"Modern heuristic optimization techniques: theory and applications"*, Kluwer (2008).

- Hamdy A. Taha, *"Operations Research: An Introduction"*, 8th Edition, Pearson Education (2008).

- G. V. Reklaitis, A. Ravindran, K. M. Ragsdell, *"Engineering Optimization: Methods and Applications"*, Wiley (2006).

- Michael C. Bartholomew-Biggs, *"Nonlinear optimization with engineering applications"*, Springer (2008).