

CE/BOS/ CE 633/0412

**K L UNIVERSITY**  
**OPTIMIZATION OF STRUCTURES (11 – CE 633)**

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3	0	0	3

**SYLLABUS**

Basics of engineering analysis and design, Need for optimal design,

formulation of optimal design problems, basic difficulties associated with solution of optimal problems,

Classical optimization methods, necessary and sufficient optimality criteria for unconstrained and constrained problems,

Kuhn-Tucker conditions, Global optimality and convex analysis,

Linear optimal problems, Simplex method, Introduction to Karmarkar's algorithm.

Numerical methods for nonlinear unconstrained and constrained problems, sensitivity analysis, Linear post optimal analysis, sensitivity analysis of discrete and distributed systems.

Introduction to variational methods of sensitivity analysis, shape sensitivity,

Introduction to integer programming, dynamic programming, stochastic programming and geometric programming,

Introduction to genetic algorithm and simulated annealing.

**Text Books**

1. S.S. Rao, Optimization, Theory and Applications, 2nd Edition, Wiley Eastern Ltd., New Delhi, 1991.
2. Kalyanmoy Deb, Optimization for Engineering Design: Algorithms and examples, Prentice Hall India Pvt. Ltd, 1998.

**Reference Books:**

1. J.S. Arora, Introduction to Optimum Design, McGraw-Hill Book Company, New York, 1989.
2. A.J. Morris (Editor), Foundations of Structural Optimization - A Unified Approach; John Wiley and Sons, Chichester, 1982.
3. R.T. Hafta and Z. Gurdal, Elements of Structural Optimization, 3rd Ed., Kluwer academic publishers, 1996.