NPTEL Video Course - Mechanical Engineering - NOC:Optimization from Fundamentals

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Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 30 - Extreme points and basic feasible solutions
Lecture 31 - Equivalence of extreme point and BFS
Lecture 32 - Equivalence of extreme point and BFS (Continued...)
Lecture 33 - Examples of Linear Programming
Lecture 34 - Weak and Strong duality
Lecture 35 - Proof of strong duality
Lecture 36 - Proof of strong duality (Continued...)
Lecture 37 - Farkas' lemma
Lecture 38 - Max-flow Min-cut problem
Lecture 39 - Shortest path problem
Lecture 40 - Complementary Slackness
Lecture 41 - Proof of complementary slackness
Lecture 42 - Tangent cones
Lecture 43 - Tangent cones (Continued...)
Lecture 44 - Constraint qualifications, Farkas' lemma and KKT
Lecture 45 - KKT conditions
Lecture 46 - Convex optimization and KKT conditions
Lecture 47 - Slater condition and Lagrangian Dual
Lecture 48 - Weak duality in convex optimization and Fenchel dual
Lecture 49 - Geometry of the Lagrangian
Lecture 50 - Strong duality in convex optimization - I
Lecture 51 - Strong duality in convex optimization - II
Lecture 52 - Strong duality in convex optimization - III
Lecture 53 - Line search methods for unconstrained optimization
Lecture 54 - Wolfe conditions
Lecture 55 - Line search algorithm and convergence
Lecture 56 - Steepest descent method and rate of convergence
Lecture 57 - Newton's method
Lecture 58 - Penalty methods
Lecture 59 - L1 and L2 Penalty methods
Lecture 60 - Augmented Lagrangian methods
Lecture 61 - Cutting plane methods
Lecture 62 - Interior point methods for linear programming
Lecture 63 - Dynamic programming: Inventory control problem
Lecture 64 - Policy and value function
Lecture 65 - Principle of optimality in dynamic programming
Lecture 66 - Principle of optimality applied to inventory control problem
Lecture 67 - Optimal control for a system with linear state dynamics and quadratic cost