NPTEL Video Course - Mechanical Engineering - Design and Optimization of Energy systems

Subject Co-ordinator - Prof. C. Balaji

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Optimization
Lecture 2 - System Design and Analysis
Lecture 3 - Workable system
Lecture 4 - System simulation
Lecture 5 - Information flow diagrams
Lecture 6 - Successive substitution method
Lecture 7 - Successive substitution method (Continued.)
Lecture 8 - Successive substitution method and Newton-Raphson method
Lecture 9 - Newton-Raphson method (Continued.)
Lecture 10 - Convergence characteristics of Newton-Raphson method
Lecture 11 - Newton-Raphson method for multiple variables
Lecture 12 - Solution of system of linear equations
Lecture 13 - Introduction to Curve fitting
Lecture 14 - Example for Lagrange interpolation
Lecture 15 - Lagrange interpolation (Continued.)
Lecture 16 - Best fit
Lecture 17 - Least Square Regression
Lecture 18 - Least Square Regression (Continued.)
Lecture 19 - Least Square Regression (Continued.)
Lecture 20 - Non-linear Regression (Gauss - Newton Algorithm)
Lecture 21 - Optimization- Basic ideas
Lecture 22 - Properties of objective function and cardinal ideas in optimization
Lecture 23 - Unconstrained optimization
Lecture 24 - Constrained optimization problems
Lecture 25 - Mathematical proof of the Lagrange multiplier method
Lecture 26 - Test for Maxima / Minima
Lecture 27 - Handling in-equality constraints
Lecture 28 - Kuhn-Tucker conditions (Continued.)
Lecture 29 - Uni-modal function and search methods

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Lecture 30 - Dichotomous search
Lecture 31 - Fibonacci search method
Lecture 32 - Reduction ratio of Fibonacci search method
Lecture 33 - Introduction to multi-variable optimization
Lecture 34 - The Conjugate gradient method
Lecture 35 - The Conjugate gradient method (Continued.)
Lecture 36 - Linear programming
Lecture 37 - Dynamic programming
Lecture 38 - Genetic Algorithms
Lecture 39 - Genetic Algorithms (Continued.)
Lecture 40 - Simulated Annealing and Summary
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