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6. Linear Programming Methods for Optimum Design 6.1 Definition of a Standard Linear Programming Problem; 6.2 Basic Concepts Related to Linear Programming Problems; 6.3 Basic Ideas and Steps of the Simplex Method; 6.4 Two-Phase Simplex Method-Artificial Variables; 6.5 Postoptimality Analysis; 6.6 Solution of LP Problems Using Excel Solver; Exercises for Chapter 6; 7. More on Linear Programming Methods for Optimum Design; 7.1 Derivation of the Simplex Method; 7.2 Alternate Simplex Method; 7.3 Duality in Linear Programming; Exercises for Chapter 7
8. Numerical Methods for Unconstrained Optimum Design 8.1 General Concepts Related to Numerical Algorithms; 8.2 Basic Ideas and Algorithms for Step Size Determination; 8.3 Search Direction Determination: Steepest Descent Method; 8.4 Search Direction Determination: Conjugate Gradient Method; Exercises for Chapter 8; 9. More on Numerical Methods for Unconstrained Optimum Design; 9.1 More on Step Size Determination; 9.2 More on Steepest Descent Method; 9.3 Scaling of Design Variables; 9.4 Search Direction Determination: Newton's Method; 9.5 Search Direction Determination: Quasi-Newton Methods
9.6 Engineering Applications of Unconstrained Methods

Sommario/riassunto

Optimization is a mathematical tool developed in the early 1960's used to find the most efficient and feasible solutions to an engineering problem. It can be used to find ideal shapes and physical configurations, ideal structural designs, maximum energy efficiency, and many other desired goals of engineering. This book is intended for use in a first course on engineering design and optimization. Material for the text has evolved over a period of several years and is based on classroom presentations for an undergraduate core course on the principles of design. Virtually any problem f