## **Table of Contents**

Preface				
СНА	PTER 1			
Unconstrained Optimization via Calculus				
1.1.	Functions of One Variable			
1.2.	Functions of Several Variables	:		
1.3.	Positive and Negative Definite Matrices and Optimization	1.		
	Coercive Functions and Global Minimizers	2:		
1.5.	Eigenvalues and Positive Definite Matrices	25		
	Exercises	3		
СНА	PTER 2			
Con	vex Sets and Convex Functions	31		
2.1.	Convex Sets	31		
*2.2.	Some Illustrations of Convex Sets in Economics—			
	Linear Production Models	43		
2.3.	Convex Functions	45		
2.4.	Convexity and the Arithmetic-Geometric Mean Inequality-			
	An Introduction to Geometric Programming	58		
2.5.	Unconstrained Geometric Programming	66		
	Convexity and Other Inequalities	73		
	Exercises	77		
CHA)	PTER 3			
Itera	tive Methods for Unconstrained Optimization	82		
	Newton's Method	83		
3.2.	The Method of Steepest Descent	97		

X Table of Contents

	Beyond Steepest Descent	105 112
	Secant Methods for Minimization	121
3.3.	Exercises	128
	2.00.00.00	
CHAI	PTER 4	
Leas	t Squares Optimization	133
4.1.	Least Squares Fit	133
4.2.	Subspaces and Projections	141
	Minimum Norm Solutions of Underdetermined Linear Systems	145
	Generalized Inner Products and Norms; The Portfolio Problem	148
	Exercises	152
	PTER 5	
Conv	ex Programming and the Karush-Kuhn-Tucker Conditions	156
5.1.	Separation and Support Theorems for Convex Sets	157
	Convex Programming; The Karush-Kuhn-Tucker Theorem	169
5.3.	The Karush-Kuhn-Tucker Theorem and Constrained Geometric	
	Programming	188
5.4.	Dual Convex Programs	199
	Trust Regions	210
	Exercises	212
	PTER 6	
Pena	lty Methods	215
6.1.	Penalty Functions	215
6.2.	The Penalty Method	219
6.3.	Applications of the Penalty Function Method to Convex Programs	226
	Exercises	235
CII.	DTFD 7	
	PTER 7	220
Opti	mization with Equality Constraints	238
7.1.	Surfaces and Their Tangent Planes	240
	Lagrange Multipliers and the Karush-Kuhn-Tucker Theorem for	
	Mixed Constraints	245
7.3.	Quadratic Programming	258
	Exercises	266
T J -		271
Inge:	x	271