Pref	face	ix
Ch	apter 0 A Few Introductory Remarks	1
Ch	apter 1 Introduction to Quadratic Forms and Differential Equations	
1.0	Introduction	4
1.1	The Finite-Dimensional Case	5
1.2	The Calculus of Variations	25
1.3	Fundamental Lemmas (Integration by Parts)	31
1.4	Quadratic Forms and Differential Equations	38
Ch	apter 2 Abstract Theory	
2.0	Introduction	58
2.1	Hilbert Space Theory	59
2.2	Further Ideas of Hestenes	62
2.3	Approximation Theory of Quadratic Forms	73
Cha	apter 3 The Second-Order Problem	
3.0	Introduction	82
3.1	The Focal-Point Problem	83
3.2	The Numerical Problem	88
3.3	The Eigenvalue Problem	103
	The Numerical Eigenvalue Problems	114
	Proofs of Results	135

## viii Contents

Index

Cha	apter 4 The 2nth-Order Problem	
4.0	Introduction	14
4.1	The Signature Theory of Lopez	14
	Approximation Theory	15
	Comparison Results	16
4.4	Higher-Order Numerical Problems and Splines	16
Cha	apter 5 Elliptic Partial Differential Equations	
5.0	Introduction	17
5.1	Summary	17.
	The Numerical Problem	18
5.3	Separation of Variables	19
Ch	apter 6 The Quadratic Control Problem	
6.0	Introduction	20
6.1	Focal-Interval Theory of Quadratic Forms	20:
	Focal Arcs of Differential Equations	20
	Two Examples	21.
6.4	An Approximation Theory of Focal Intervals	22
Pos	stscript The Numerical Problem Revisited	
1	The $x(t)x'(t)$ Term	22:
2	Cheap Boundary-Value Methods	220
3	Systems	22
4	Nonlinear Problems	229
Ref	Ferences	23

235