

TABLE OF CONTENTS

Chapter 1.	Introduction and Formulation of the Model	
1.1	Introduction and summary	1
1.2	General model and notation	7
1.3	Linear Gaussian model	14
Chapter 2.	Estimation	
2.1	Introduction	16
2.2	General filtering theory	19
2.3	Estimation formulas	26
2.4	Estimation for the linear Gaussian model: the Kalman filter	32
Chapter 3.	Statistics Sufficient for Control	
3.1	Introduction	38
3.2	Definitions and preliminary results	42
3.3	Equivalent statistics	48
3.4	Sufficient statistics for linear Gaussian systems	53
Chapter 4.	General Theory of Optimality	
4.1	Introduction	59
4.2	Conditional loss functionals	61
4.3	Optimality for $\{u\}$ at time t	69
4.4	Minimum loss function	79
Chapter 5.	Selection Classes	
5.1	Introduction	88
5.2	Definitions and preliminary results	92
5.3	Properties of selection classes	98
5.4	Complete families of selection classes	104
5.5	Single selection class	117
Chapter 6.	Quadratic Loss	
6.1	Optimal control for the linear Gaussian model	128
6.2	General quadratic loss	130
6.3	Quadratic final miss loss function	135
Chapter 7.	An Absolute Value Loss Function	139
7.1	Introduction	139
7.2	Continuity and variation diminishing properties of the Gaussian convolution	140
7.3	Absolute value loss: preliminaries	151
7.4	Absolute value loss function: non-decreasing sensitivity	161
Appendix		
A.1	Stochastic kernels	172
A.2	P-ess inf	184
References		207