

Contents

1. Causality.....	1
A. Resolution Space.....	3
B. Causal Operators.....	8
C. Closure Theorems.....	14
D. The Integrals of Triangular Truncation.....	22
E. Strictly Causal Operators.....	29
F. Operator Decomposition.....	41
G. Problems and Discussion.....	50
2. Feedback Systems.....	61
A. Well-Posedness.....	63
B. Stability.....	72
C. Sensitivity.....	82
D. Optimal Controllers.....	89
E. Problems and Discussion.....	100
3. Dynamical Systems.....	114
A. State Decomposition.....	116
B. Controllability, Observability and Stability.....	132
C. The Regulator Problem.....	140
D. Problems and Discussion.....	148
4. Time-Invariance.....	155
A. Uniform Resolution Space.....	156
B. Spaces of Time-Invariant Operators.....	160
C. The Fourier Transform.....	168
D. The Laplace Transform.....	178
E. Problems and Discussion.....	191

Appendices

A. Topological Groups.....	204
A. Elementary Group Concepts.....	205
B. Character Groups.....	206
C. Ordered Groups.....	209
D. Integration on (LCA) Groups.....	211
E. Differentiation on (LCA) Groups.....	214
B. Operator Valued Integration.....	217
A. Operator Valued Measures.....	219
B. The Lebesgue Integral.....	222
C. The Cauchy Integrals.....	225
D. Integration over Spectral Measures.....	229
C. Spectral Theory.....	232
A. Spectral Theory for Unitary Groups.....	233
B. Spectral Multiplicity Theory.....	237
C. Spectral Theory for Contractive Semigroups.....	240
D. Representation Theory.....	244
A. Resolution Space Representation Theory.....	245
B. Uniform Resolution Space Representation Theory.....	248
.....	258