

Contents

Preface	v
Chapter 1: Semigroups and Their Generators	1
1 Basic Properties	1
2 Other Continuity Conditions for Semigroups	12
3 Norm Continuity	19
4 Semigroups on Dual Spaces	22
5 Differentiable and Analytic Vectors	26
6 Notes	33
Chapter 2: Resolvents	34
1 Elementary Properties	34
2 Spectral Theory	39
3 Classification of Generators	48
4 Subordinated Semigroups	55
5 Bounded Holomorphic Semigroups	59
6 Notes	66
Chapter 3: Perturbations of Generators	68
1 Relatively Bounded Perturbations	68
2 Relatively Compact Perturbations	76
3 Convergence of Generators	80
4 The Product Formula	90
5 Notes	94
Chapter 4: Self-adjoint Operators	95
1 Elementary Results	95
2 Quadratic Forms	103
3 Relatively Bounded Perturbations	111
4 Convergence of Self-adjoint Operators	113
5 The Product Formula	119
6 Notes	122

Chapter 5: Asymptotic Analysis	123
1 Mean Ergodic Theorem	123
2 First Order Results	127
3 Second Order Results with Ergodic Condition	132
4 Unrestricted Second Order Results	138
5 Uniform Time Limits	145
6 Notes	148
Chapter 6: Contraction Semigroups on Hilbert Space	150
1 Classification of Generators	150
2 Completely Non-unitary Semigroups	154
3 The Dilation Theorem	157
4 Structure of the Minimal Dilation	161
5 Square-integrable Vectors	168
6 Notes	171
Chapter 7: Positive Semigroups	173
1 Positivity and Irreducibility	173
2 Criteria for Positivity and Irreducibility	179
3 Introduction to Markov Semigroups	187
4 Peripheral Point Spectrum	193
5 Notes	196
Chapter 8: Groups of Isometries	198
1 Some Examples	198
2 Spectral Subspaces	203
3 The Spectral Theorems	212
4 Bounded Hermitian Operators	216
5 Notes	219
Notation Index	227
Index	228