

Contents

Preface	vii
Notation	ix
General Notation	ix
Functions and Distributions	xi
Measures and Integrals	xi
Spaces of Functions, Measures and Distributions	xii
Some Families of Functions	xiv
Norms, Scalar Products and Seminorms	xiv
Notation from Functional Analysis, Operators	xv
Notations related to Pseudo-Differential Operators	xvi
Notations related to Potential Theory and Harmonic Analysis	xvi
Introduction: Pseudo-Differential Operators and Markov Processes	xix
II Generators and Their Potential Theory	1
1 Introduction	3
2 Generators of Feller and Sub-Markovian Semigroups	13
2.1 Second Order Elliptic Differential Operators as Generators of Feller and Sub-Markovian Semigroups	13
2.2 Some Second Order Differential Operators with Non-Negative Characteristic Form as Generators of Sub-Markovian Semigroups	48
2.3 Some Properties of Pseudo-Differential Operators with Negative Definite Symbols	66

2.4	Hoh's Symbolic Calculus for Pseudo-Differential Operators with Negative Definite Symbols	87
2.5	Estimates for Pseudo-Differential Operators with Negative Definite Symbols Using the Symbolic Calculus	113
2.6	Feller Semigroups and Sub-Markovian Semigroups Generated by Pseudo-Differential Operators	126
2.7	Further Analytic Approaches for Constructing Feller and Sub-Markovian Semigroups	138
2.8	Some Perturbation Results	151
2.9	On Semigroups Obtained by Subordination	172
2.10	Pseudo-Differential Operators with Variable Order of Differentiation as Generators of Feller Semigroups	204
3	Potential Theory of Semigroups and Generators	213
3.1	Capacities and Abstract Bessel Potential Spaces	213
3.2	First Results on L^p -Sub-Markovian Semigroups in their Associated Bessel Potential Spaces	244
3.3	Bessel Potential Spaces Associated with a Continuous Negative Definite Function	270
3.4	Stein's Littlewood–Paley Theory for Sub-Markovian Semigroups	300
3.5	Global Properties of L^p -Sub-Markovian Semigroups	336
3.6	Nash-Type and Sobolev-Type Inequalities — a Short Outline .	409
	Bibliography	417
	Author Index	443
	Subject Index	447