

1. Record Nr.	UNINA9910483698803321
Autore	Taira Kazuaki
Titolo	Boundary Value Problems and Markov Processes [[electronic resource] /] / by Kazuaki Taira
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2009
ISBN	1-280-38434-4 9786613562265 3-642-01677-4
Edizione	[2nd ed. 2009.]
Descrizione fisica	1 online resource (XII, 192 p. 41 illus.)
Collana	Lecture Notes in Mathematics, , 0075-8434 ; ; 1499
Disciplina	519.233
Soggetti	Mathematical analysis Analysis (Mathematics) Partial differential equations Operator theory Probabilities Analysis Partial Differential Equations Operator Theory Probability Theory and Stochastic Processes
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"This second edition has been revised to streamline some of the analysis and to give better coverage of important examples and applications. The errors in the first printing are corrected ... additional references have been included in the bibliography."--p. vii.
Nota di bibliografia	Includes bibliographical references (p. 179-182) and index.
Nota di contenuto	and Main Results -- Semigroup Theory -- L Theory of Pseudo-Differential Operators -- L Approach to Elliptic Boundary Value Problems -- Proof of Theorem 1.1 -- A Priori Estimates -- Proof of Theorem 1.2 -- Proof of Theorem 1.3 - Part (i) -- Proof of Theorem 1.3, Part (ii) -- Application to Semilinear Initial-Boundary Value Problems -- Concluding Remarks.
Sommario/riassunto	This volume is devoted to a thorough and accessible exposition on the functional analytic approach to the problem of construction of Markov processes with Ventcel' boundary conditions in probability theory.

Analytically, a Markovian particle in a domain of Euclidean space is governed by an integro-differential operator, called a Waldenfel's operator, in the interior of the domain, and it obeys a boundary condition, called the Ventcel' boundary condition, on the boundary of the domain. Probabilistically, a Markovian particle moves both by jumps and continuously in the state space and it obeys the Ventcel' boundary condition, which consists of six terms corresponding to the diffusion along the boundary, the absorption phenomenon, the reflection phenomenon, the sticking (or viscosity) phenomenon, the jump phenomenon on the boundary, and the inward jump phenomenon from the boundary. In particular, second-order elliptic differential operators are called diffusion operators and describe analytically strong Markov processes with continuous paths in the state space such as Brownian motion. We observe that second-order elliptic differential operators with smooth coefficients arise naturally in connection with the problem of construction of Markov processes in probability. Since second-order elliptic differential operators are pseudo-differential operators, we can make use of the theory of pseudo-differential operators as in the previous book: Semigroups, boundary value problems and Markov processes (Springer-Verlag, 2004). Our approach here is distinguished by its extensive use of the ideas and techniques characteristic of the recent developments in the theory of partial differential equations. Several recent developments in the theory of singular integrals have made further progress in the study of elliptic boundary value problems and hence in the study of Markov processes possible. The presentation of these new results is the main purpose of this book.
