

1. Record Nr.	UNINA9910465209603321
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Titolo	Markov processes from K. Ito's perspective // Daniel W. Stroock
Pubbl/distr/stampa	Princeton, New Jersey ; ; Oxfordshire, England : , : Princeton University Press, , 2003 ©2003
ISBN	0-691-11542-7 1-4008-3557-7
Descrizione fisica	1 online resource (289 p.)
Collana	Annals of Mathematics Studies ; ; Number 155
Classificazione	SI 830
Disciplina	519.2/33
Soggetti	Markov processes Stochastic difference equations Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Frontmatter -- Contents -- Preface -- Chapter 1. Finite State Space, a Trial Run -- Chapter 2. Moving to Euclidean Space, the Real Thing -- Chapter 3. Itô's Approach in the Euclidean Setting -- Chapter 4. Further Considerations -- Chapter 5. Itô's Theory of Stochastic Integration -- Chapter 6. Applications of Stochastic Integration to Brownian Motion -- Chapter 7. The Kunita-Watanabe Extension -- Chapter 8. Stratonovich's Theory -- Notation -- References -- Index
Sommario/riassunto	Kiyosi Itô's greatest contribution to probability theory may be his introduction of stochastic differential equations to explain the Kolmogorov-Feller theory of Markov processes. Starting with the geometric ideas that guided him, this book gives an account of Itô's program. The modern theory of Markov processes was initiated by A. N. Kolmogorov. However, Kolmogorov's approach was too analytic to reveal the probabilistic foundations on which it rests. In particular, it hides the central role played by the simplest Markov processes: those with independent, identically distributed increments. To remedy this defect, Itô interpreted Kolmogorov's famous forward equation as an equation that describes the integral curve of a vector field on the space of probability measures. Thus, in order to show how Itô's thinking leads

to his theory of stochastic integral equations, Stroock begins with an account of integral curves on the space of probability measures and then arrives at stochastic integral equations when he moves to a pathspace setting. In the first half of the book, everything is done in the context of general independent increment processes and without explicit use of Itô's stochastic integral calculus. In the second half, the author provides a systematic development of Itô's theory of stochastic integration: first for Brownian motion and then for continuous martingales. The final chapter presents Stratonovich's variation on Itô's theme and ends with an application to the characterization of the paths on which a diffusion is supported. The book should be accessible to readers who have mastered the essentials of modern probability theory and should provide such readers with a reasonably thorough introduction to continuous-time, stochastic processes.

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