

1. Record Nr.	UNISA996466403203316
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Titolo	An Introduction to Continuous-Time Stochastic Processes [[electronic resource] ] : Theory, Models, and Applications to Finance, Biology, and Medicine // by Vincenzo Capasso, David Bakstein
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Birkhäuser, , 2021
ISBN	3-030-69653-7
Edizione	[4th ed. 2021.]
Descrizione fisica	1 online resource (574 pages)
Collana	Modeling and Simulation in Science, Engineering and Technology, , 2164-3725
Disciplina	519.2
Soggetti	Stochastic processes Stochastic models Mathematical models Social sciences - Mathematics Biomathematics Stochastic Processes Stochastic Modelling Mathematical Modeling and Industrial Mathematics Mathematics in Business, Economics and Finance Mathematical and Computational Biology Processos estocàstics Models matemàtics Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Foreword -- Preface to the Fourth Edition -- Preface to the Third Edition -- Preface to the Second Edition -- Preface -- Part I: Theory of Stochastic Processes -- Fundamentals of Probability -- Stochastic Processes -- The Itô Integral -- Stochastic Differential Equations -- Stability, Stationary, Ergodicity -- Part II: Applications of Stochastic Processes -- Applications to Finance and Insurance -- Applications to Biology and Medicine -- Measure and Integration -- Convergence of

Probability Measures on Metric Spaces -- Diffusion Approximation of a Langevin System -- Elliptic and Parabolic Equations -- Semigroups of Linear Operators -- Stability of Ordinary Differential Equations -- References -- Nomenclature -- Index.

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## Sommario/riassunto

This textbook, now in its fourth edition, offers a rigorous and self-contained introduction to the theory of continuous-time stochastic processes, stochastic integrals, and stochastic differential equations. Expertly balancing theory and applications, it features concrete examples of modeling real-world problems from biology, medicine, finance, and insurance using stochastic methods. No previous knowledge of stochastic processes is required. Unlike other books on stochastic methods that specialize in a specific field of applications, this volume examines the ways in which similar stochastic methods can be applied across different fields. Beginning with the fundamentals of probability, the authors go on to introduce the theory of stochastic processes, the Itô Integral, and stochastic differential equations. The following chapters then explore stability, stationarity, and ergodicity. The second half of the book is dedicated to applications to a variety of fields, including finance, biology, and medicine. Some highlights of this fourth edition include a more rigorous introduction to Gaussian white noise, additional material on the stability of stochastic semigroups used in models of population dynamics and epidemic systems, and the expansion of methods of analysis of one-dimensional stochastic differential equations. An Introduction to Continuous-Time Stochastic Processes, Fourth Edition is intended for graduate students taking an introductory course on stochastic processes, applied probability, stochastic calculus, mathematical finance, or mathematical biology. Prerequisites include knowledge of calculus and some analysis; exposure to probability would be helpful but not required since the necessary fundamentals of measure and integration are provided. Researchers and practitioners in mathematical finance, biomathematics, biotechnology, and engineering will also find this volume to be of interest, particularly the applications explored in the second half of the book.

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