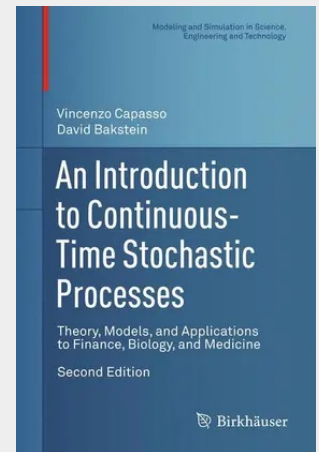


An Introduction to Continuous-Time Stochastic Processes

Theory, Models, and Applications to Finance, Biology, and Medicine

Expanding on the first edition of An Introduction to Continuous-Time Stochastic Processes, this concisely written book is a rigorous and self-contained introduction to the theory of continuous-time stochastic processes. A balance of theory and applications, the work features concrete examples of modeling real-world problems from biology, medicine, industrial applications, finance, and insurance using stochastic methods. No previous knowledge of stochastic processes is required.

From reviews of First Edition: The book is . an account of fundamental concepts as they appear in relevant modern applications and literature. . The book addresses three main groups: first, mathematicians working in a different field; second, other scientists and professionals from a business or academic background; third, graduate or advanced undergraduate students of a quantitative subject related to stochastic theory and/or applications. —Zentralblatt MATH This is an introductory text on continuous time stochastic processes and their applications to finance and biology. The book will be useful for applied mathematicians who are not probabilists to get a quick flavour of the techniques of stochastic calculus, and for professional probabilists to get a quick flavour of the applications. —Mathematical Reviews Revised and enhanced, this concisely written second edition of An Introduction to Continuous-Time Stochastic Processes is 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, the work features concrete examples of modeling real-world problems from biology, medicine, industrial applications, finance, and insurance using stochastic methods. No previous knowledge of stochastic processes is required. Key topics include: * Markov processes * Stochastic differential equations * Arbitrage-free markets and financial derivatives * Insurance risk * Population dynamics * Agent-based models New to the Second Edition: * Improved presentation of original concepts * Expanded background on probability theory * Substantial material applicable to finance and biology, including stable laws, Lévy processes, and Itô-Lévy calculus * Supplemental appendix to provide basic facts on semigroups of linear operators An Introduction to Continuous-Time Stochastic Processes, Second Edition will be of interest to a broad audience of students, pure and applied mathematicians, and researchers and practitioners in mathematical finance, biomathematics, biotechnology, and engineering. Suitable as a textbook for graduate or undergraduate courses, as well as European Masters courses (according to the two-year-long second cycle of the "Bologna Scheme"), the work may also be used for self-study or as a reference. 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.



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