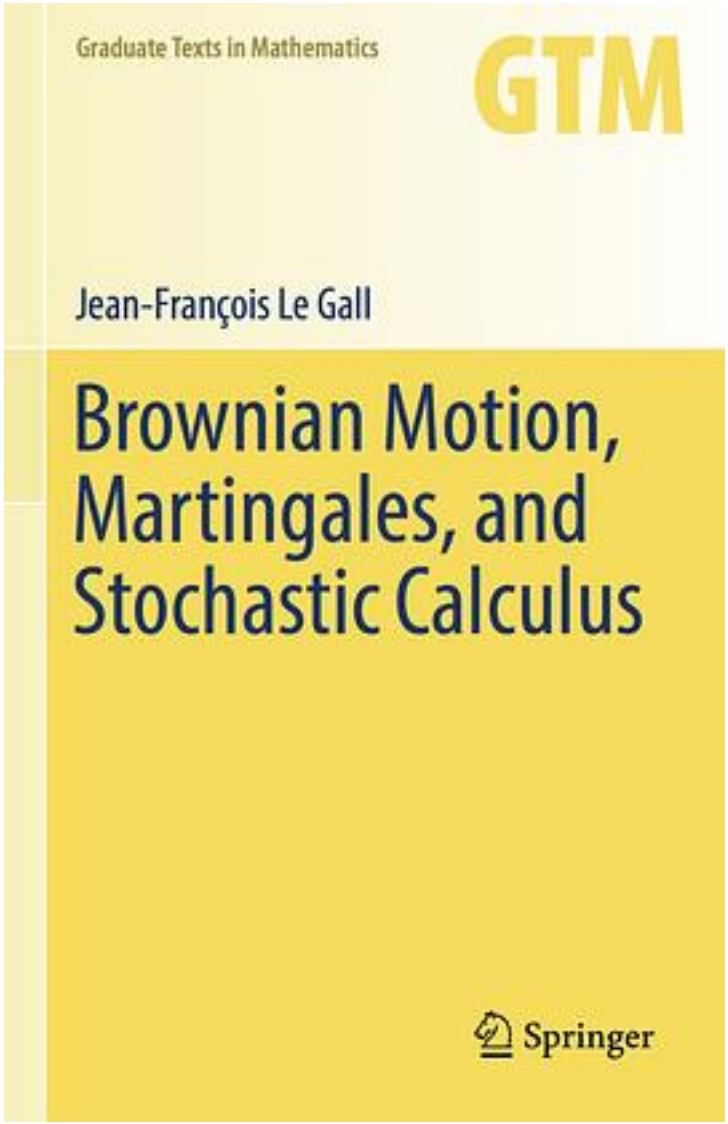
Brownian Motion, Martingales, and Stochastic Calculus



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著者:Le Gall, Jean-François

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This book offers a rigorous and self-contained presentation of stochastic integration and stochastic calculus within the general framework of continuous semimartingales. The main tools of stochastic calculus, including Itô’ s formula, the optional stopping theorem and Girsanov’ s theorem, are treated in detail alongside many illustrative examples. The book also contains an introduction to Markov processes, with applications to solutions of stochastic differential equations and to connections between Brownian motion and partial differential equations. The theory of local times of semimartingales is discussed in the last chapter.

Since its invention by Itô, stochastic calculus has proven to be one of the most important techniques of modern probability theory, and has been used in the most recent theoretical advances as well as in applications to other fields such as mathematical finance. Brownian Motion, Martingales, and Stochastic Calculus provides a strong theoretical background to the reader interested in such developments.

Beginning graduate or advanced undergraduate students will benefit from this detailed approach to an essential area of probability theory. The emphasis is on concise and efficient presentation, without any concession to mathematical rigor. The material has been taught by the author for several years in graduate courses at two of the most prestigious French universities. The fact that proofs are given with full details makes the book particularly suitable for self-study. The numerous exercises help the reader to get acquainted with the tools of stochastic calculus.

作者介绍:

Jean-François Le Gall is a well-known specialist of probability theory and stochastic processes. His main research achievements are concerned with Brownian motion, superprocesses and their connections with partial differential equations, and more recently random trees and random graphs. He has been awarded several international prizes in mathematics, including the Loeve Prize and the Fermat Prize, and gave a plenary lecture at the 2014 International Congress of Mathematicians. He is currently a professor of mathematics at Université Paris-Sud and a member of the French Academy of Sciences.

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