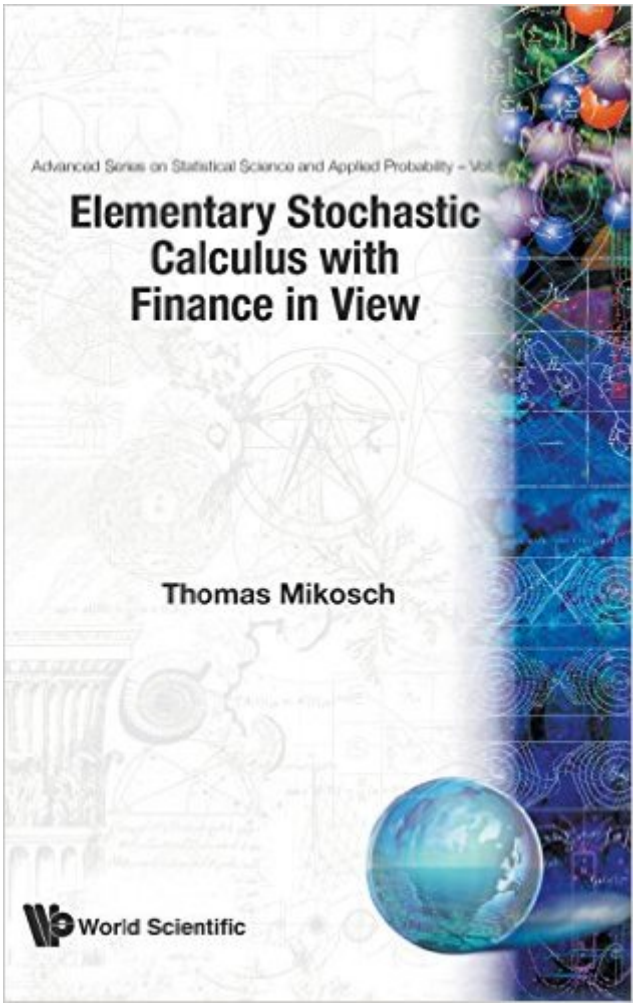
# Elementary Stochastic Calculus With Finance In View (Advanced Series On Statistical Science & Applied Probability, Vol 6) (Advanced Series On Statistical Science And Applied Probability)

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## Synopsis

Modelling with the ItÃ´ integral or stochastic differential equations has become increasingly important in various applied fields, including physics, biology, chemistry and finance. However, stochastic calculus is based on a deep mathematical theory. This book is suitable for the reader without a deep mathematical background. It gives an elementary introduction to that area of probability theory, without burdening the reader with a great deal of measure theory. Applications are taken from stochastic finance. In particular, the Black Scholes option pricing formula is derived. The book can serve as a text for a course on stochastic calculus for non-mathematicians or as elementary reading material for anyone who wants to learn about ItÃ´ calculus and/or stochastic finance. Contents: Preliminaries: Basic Concepts from Probability Theory; Stochastic Processes; Brownian Motion; Conditional Expectation; Martingales; The Stochastic Integral: The Riemann and Riemann Stieltjes Integrals; The ItÃ´ Integral; The ItÃ´ Lemma; The Stratonovich and Other Integrals; Stochastic Differential Equations: Deterministic Differential Equations; ItÃ´ Stochastic Differential Equations; The General Linear Differential Equation; Numerical Solution; Applications of Stochastic Calculus in Finance: The Black Scholes Option-Pricing Formula; A Useful Technique: Change of Measure; Appendices: Modes of Convergence; Inequalities; Non-Differentiability and Unbounded Variation of Brownian Sample Paths; Proof of the Existence of the General ItÃ´ Stochastic Integral; The Radon Nikodym Theorem; Proof of the Existence and Uniqueness of the Conditional Expectation.

## Book Information

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Finance

## Customer Reviews

Not having a strong theoretical mathematics background hindered my ability to read advanced stochastic finance. I found most "introduction to financial mathematics" for derivatives either too elementary or too advanced (i.e. unreadable). Mikosch has done an outstanding job of explaining key concepts of stochastic calculus, without losing a mathematically unsophisticated reader. After reading this book, one should feel comfortable reading more advanced texts on derivatives, which are usally full of mathematical jargon. I think, it’s more suitable for readers with economics or engineering backgrounds who want to further explore the world of financial derivatives. If you have strong background in Analysis and Measure Theory, you might find this book too slow and not detailed enough (but then you are not the intended audience). Also, the book in itself is just an entry point into stochastic calculus and you’ll need more advanced/theoretical texts on derivatives after. In my opinion, the book is not suitable for people who just want preliminary knowledge of derivatives; they should look for broader finance books, which usually have a few chapters on derivatives.

I have recently started to work with stochastic calculus. While I do have a mathematical background and I do understand advanced concepts like measure theory, I wanted something that I could bring down to a level that I could see the wood from the trees. This is pedagogically better.Unfortunately, there are so few books out there that strive to be anything but a way to demonstrate the author’s cleverness that when I do find a book that is understandable by someone who has had no training in that field, I can’t sing its praises enough (For physics people Feyman’s lectures are easily the best).Mikosch explains things in a clear easily understandable way. He goes over probability theory, stochastic processes, the Ito Integral and all the basic ideas. While the book is not necessarily rigourous, someone starting is probably more interested in understanding the concepts and saving the rigour for later.Understanding the core concepts now allows me to read other textbooks in more detail and it even lets me play with the concepts.For starting quants, this book rocks.

This book might just be the first ideal reading that students having to struggle with more advanced texts should do. The level is truly elementary and can be understood with the minimal 1-year college background, which is quite a feat compared with other books with similar claims. Examples are abundant and complement the pedagogically brilliant exposition by making everything intuititive.
The style and level is reminiscent of Sheldon Ross’ classics in probability and stochastic processes.

However, even though advanced topics such as Paley-Wiener representation, Stratonovitch integral and numerical integration schemes are (alas too briefly) covered, the section about finance is disappointing and way too short. In summary an excellent book but look somewhere else for finance applications. And beg Prof. Mikosch for doubling the number of pages in the next edition...

Read this small book before reading Shreve's volume II book.The sections on conditional expectataions, martingales, and Brownian motion are well written and simple enough to understand. While not packed with finance examples until the last chapter, the author attempts to provide what is needed of the subject matter to successfully complete a first semester course in Stochastic Calculus. Once read, it's a great second reference.

This is the most readable, and technical, introduction to stochastic calculus that I'm aware of. It doesn't really matter that finance is far from you. You can learn all the finance that you want, at an equally pedagogical level from Bjork's book, to give an example, as soon as you finish this. The only thing I miss in this book are equally pedagogical exercises + worked solutions. I hope that the next edition will be twice as large.

First of all, and most importantly, this is a math book with some finance in it, not the other way around, so you need to know some math before tackling it! If you find Newtonian Calculus complicated, Stochastic Calculus (which, in the realm of mathematics, is not the easiest of topics to start with) is not for you.The aim of the book is not to present mathematical finance theory, such as option pricing or the Black and Scholes framework, etc... but simply to provide a little formalism and a lot of intuition allowing to better understand random processes and how they can be built at the infinitesimal level from Brownian Motion and previsible functions, and the macro properties that follow from there. Yes, random processes are at the heart of structured finance, but the goal of the author is simply to provide the tools necessary to better grasp financial applications... elsewhere. Therefore, Mikosh opted for an intuitive and rather informal approach presented in a mere 200 pages, which is quite refreshing in a field dominated by very technical and formal 500 page snoozers.Given the scope and objectives of the book, there is no doubt that this is one of the best (and most affordable) reference available to simply and quickly gain an applied understanding of basic Stochastic Calculus. It can be used as an introduction to the topic before tackling more difficult and thorough books on SDE, or simply as a means of getting familiar with the ideas of Stochastic Calculus without bothering too much with the details of the proofs and move on to finance

applications.Being a strong believer that, at first, ideas are more important than the complex intricacies of formal proofs, this book allowed me to quickly gain a sound footing in SDE... Kudos to the author...



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