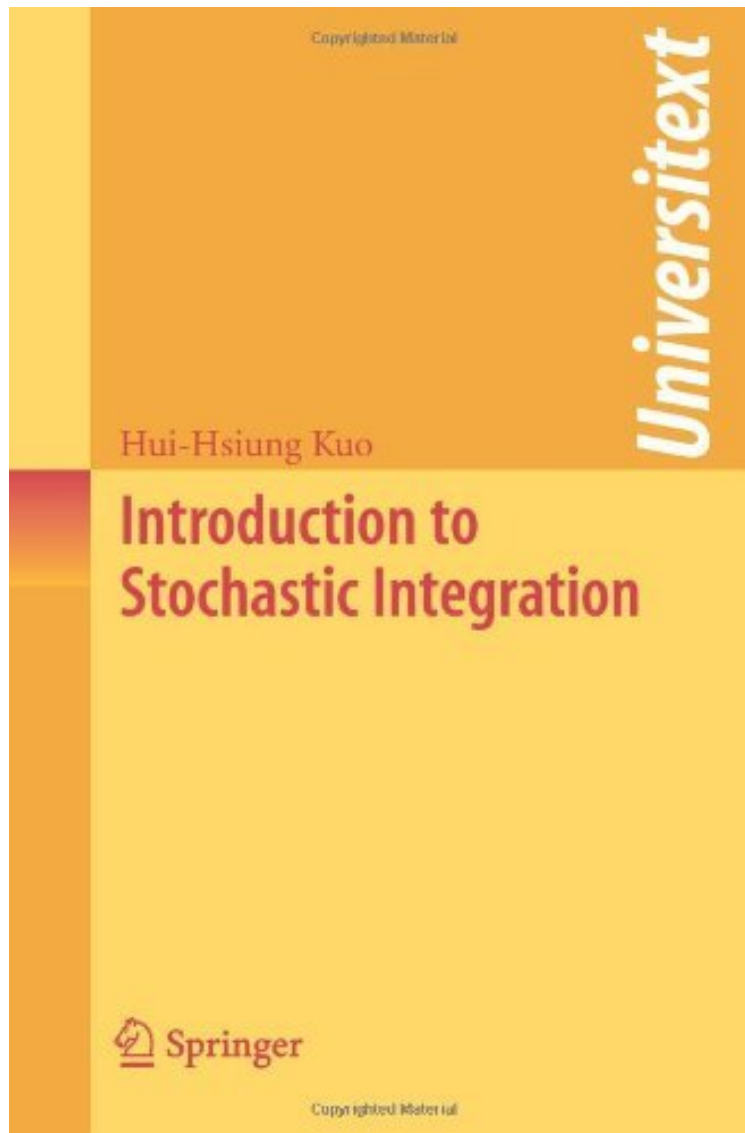


[Download free ebook] Introduction to Stochastic Integration (Universitext)

## Introduction to Stochastic Integration (Universitext)

*Hui-Hsiung Kuo*

*audiobook / \*ebooks / Download PDF / ePub / DOC*



 Download

 Read Online

#1125228 in eBooks 2006-02-04 2006-02-04 File Name: B000VHULZQ | File size: 56.Mb

**Hui-Hsiung Kuo : Introduction to Stochastic Integration (Universitext)** before purchasing it in order to gauge whether or not it would be worth my time, and all praised Introduction to Stochastic Integration (Universitext):

7 of 8 people found the following review helpful. An excellent text By D. H. From perspective of real analysis, this text gives a rigorous introduction to Ito calculus. In an extremely smooth fashion, all chapters flow out one by one. A background on real analysis is required. However, is it true that some basics of real analysis, e.g. Riemann integration, measurability, etc, are prerequisites for stochastic calculus? It was a wonderful experience for me to read though the book. 12 of 13 people found the following review helpful. The best introduction to stochastic integration ever!!! By Mountaineer Personally, I think this is the best introduction to stochastic integration ever! The author did a remarkable

job in presenting the Ito calculus and SDE to readers in an extremely clear way. The author always motivates the readers with intuitive thinking, then leads them to rigorous theory followed by concrete examples. The book only assumes some knowledge of measure theory and is accessible to a wide audience. However, no mathematical rigor is sacrificed. The author has amazingly achieved clarity, rigor and readability in a single book. The author keeps audience in mind all the time. He never assumes you may know some result used for proof. He is even so generous in spending a subsection on Borel-Cantelli Lemma and Chebyshev Inequality. So the book is really self-contained! You will find the transition between any two sections or subsections very smooth too. Besides the standard topics you may find in an introductory book in this field such as Ito integral, Ito Formula, Stratonovich Integral, Tanaka's Formula, Local Time and Girsanov Theorem, SDE and applications, the author also gives careful treatment of Wiener integral to bridge the gap between Stieltjes integral and Ito Integral. (Compensated) Poisson process is also thoroughly covered in many examples, although you may not see this in the content list. A lot of exercises are given at the end of each chapter. I consider this a great gift for readers. Many textbooks on this topic put the stuff that cannot be covered in main text into exercises or simply stack problems from other books as exercises. This book is different. The exercises are carefully designed to help readers reinforce what they've learned. So most of the exercises can be tackled by a serious graduate student in math. In a word, this is the best introductory textbook on this hard subject I've ever seen. I believe even an expert will find useful and interesting material in it. It definitely deserves a 5-star rating!

6 of 9 people found the following review helpful. A mistake by stochastic mind "It is well known that a bounded function  $f(t)$  is Riemann-Stieltjes integrable with respect to  $g$  if and only if  $f(t)$  is left continuous at  $c$ " pp79. This statement is incorrect. The reason btw is the preservation of certain properties. It is however possible in a broader context, that of measures on Banach valued processes. Perhaps the author wanted to say that R-S integrals exist for continuous integrands and the predictable sigma-algebra is the smallest which contains all of them and so perhaps it's the right idea for stochastic integrals. Although even this is not the entire picture. I have not read the whole book and thus gave it an average rating for now so I could write this review to point out a major conceptual issue; I will give it a more careful rating when and if I get the chance to read the book carefully; for now please ignore the star rating and just keep in mind my correction.

The theory of stochastic integration, also called the Ito calculus, has a large spectrum of applications in virtually every scientific area involving random functions, but it can be a very difficult subject for people without much mathematical background. The Ito calculus was originally motivated by the construction of Markov diffusion processes from infinitesimal generators. Previously, the construction of such processes required several steps, whereas Ito constructed these diffusion processes directly in a single step as the solutions of stochastic integral equations associated with the infinitesimal generators. Moreover, the properties of these diffusion processes can be derived from the stochastic integral equations and the Ito formula. This introductory textbook on stochastic integration provides a concise introduction to the Ito calculus, and covers the following topics: - Constructions of Brownian motion - Stochastic integrals for Brownian motion and martingales - The Ito formula - Multiple Wiener-Ito integrals - Stochastic differential equations - Applications to finance, filtering theory, and electric circuits

The reader should have a background in advanced calculus and elementary probability theory, as well as a basic knowledge of measure theory and Hilbert spaces. Each chapter ends with a variety of exercises designed to help the reader further understand the material. Hui-Hsiung Kuo is the Nicholson Professor of Mathematics at Louisiana State University. He has delivered lectures on stochastic integration at Louisiana State University, Cheng Kung University, Meijo University, and University of Rome 'Tor Vergata,' among others. He is also the author of Gaussian Measures in Banach Spaces (Springer 1975), and White Noise Distribution Theory (CRC Press 1996), and a memoir of his childhood growing up in Taiwan, An Arrow Shot into the Sun (Abridge Books 2004).

From the reviews: "This textbook is a self-contained and systematic introduction to stochastic integration with respect to martingales. The author gives special emphasis to the Brownian motion case. Exercises are given in each chapter." (Jorge A. Leao, Mathematical Sciences, Issue 2006 e) "Introduction to Stochastic Integration is exactly what the title says. I would maybe just add a 'friendly' introduction because of the clear presentation and flow of the contents. Given its clear structure and composition, the book could be useful for a short course on stochastic integration. The concepts are easy to grasp. Problems are given in each chapter and naturally are proof-based." (Ita Cirovic Donev, The Mathematical Sciences Digital Library, June, 2006) "This is a very good book on stochastic integration covering subjects from a construction of a Brownian motion to stochastic differential equations. It grew up from lecture notes the author elaborated during several years, and can be equally well used for teaching and self-education. The text is extremely clear and concise both in language and mathematical notation. Every topic is illustrated by simple and motivating examples. It is a timely, happily designed and well written book. It will be useful for unprepared and advanced readers." (Ilya Pavlyukevich, Zentralblatt MATH, Vol. 1101 (3), 2007) "This book covers stochastic integration with respect to square-integrable martingales. I am sure that this book will be very welcomed by students and lectures of this subject who will find many illustrative exercises provided. Reader also should not miss out on the Preface, which includes some anecdotes about

K. Itô;" (Thorsten Rheinlauml;nder, Journal of the American Statistical Association, Vol. 103 (483), September, 2008)From the Back CoverThe theory of stochastic integration, also called the Ito calculus, has a large spectrum of applications in virtually every scientific area involving random functions, but it can be a very difficult subject for people without much mathematical background. The Ito calculus was originally motivated by the construction of Markov diffusion processes from infinitesimal generators. Previously, the construction of such processes required several steps, whereas Ito constructed these diffusion processes directly in a single step as the solutions of stochastic integral equations associated with the infinitesimal generators. Moreover, the properties of these diffusion processes can be derived from the stochastic integral equations and the Ito formula. This introductory textbook on stochastic integration provides a concise introduction to the Ito calculus, and covers the following topics: \* Constructions of Brownian motion; \* Stochastic integrals for Brownian motion and martingales; \* The Ito formula; \* Multiple Wiener-Ito integrals; \* Stochastic differential equations; \* Applications to finance, filtering theory, and electric circuits. The reader should have a background in advanced calculus and elementary probability theory, as well as a basic knowledge of measure theory and Hilbert spaces. Each chapter ends with a variety of exercises designed to help the reader further understand the material. Hui-Hsiung Kuo is the Nicholson Professor of Mathematics at Louisiana State University. He has delivered lectures on stochastic integration at Louisiana State University, Cheng Kung University, Meijo University, and University of Rome "Tor Vergata," among others. He is also the author of Gaussian Measures in Banach Spaces (Springer 1975), and White Noise Distribution Theory (CRC Press 1996), and a memoir of his childhood growing up in Taiwan, An Arrow Shot into the Sun (Abridge Books 2004).