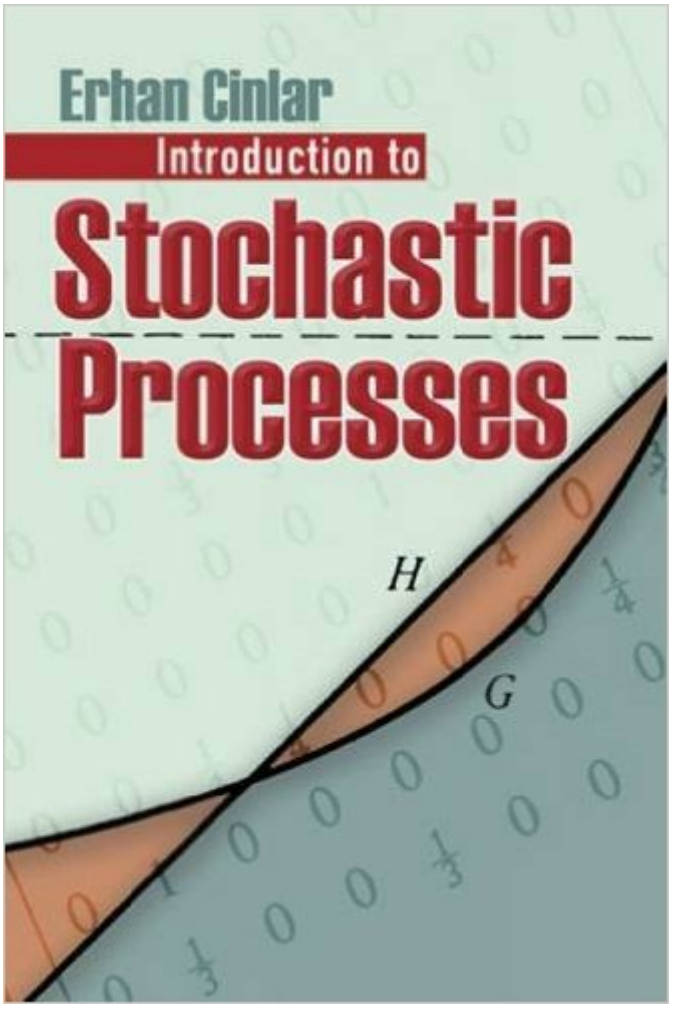
Introduction To Stochastic Processes (Dover Books On Mathematics)



Synopsis

This clear presentation of the most fundamental models of random phenomena employs methods that recognize computer-related aspects of theory. The text emphasizes the modern viewpoint, in which the primary concern is the behavior of sample paths. By employing matrix algebra and recursive methods, rather than transform methods, it provides techniques readily adaptable to computing with machines.Topics include probability spaces and random variables, expectations and independence, Bernoulli processes and sums of independent random variables, Poisson processes, Markov chains and processes, and renewal theory. Assuming some background in calculus but none in measure theory, the complete, detailed, and well-written treatment is suitable for engineering students in applied mathematics and operations research courses as well as those in a wide variety of other scientific fields. Many numerical examples, worked out in detail, appear throughout the text, in addition to numerous end-of-chapter exercises and answers to selected exercises.

Book Information

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Customer Reviews

It is an excellent introductory book in stochastic processes. But as the author have written in Afterword section of his book : "The two glaring omissions are the theories of Brownian motion and Martingales".Anyway, I strongly recommend this book for begining of stochastic processes.

It’s a great book. Very well writen, full of proofs (some of them not so detailed, but perfectly understandable) and covers almost everything you need to know to start working with stochastic

processes. However, a good knowledge about statistical and probability theories is more then desirable.

You can see by examining the table of contents that this book contains a very complete non-measure theoretic treatment of stochastic processes. The main text reads a bit "theorem-proofy" for my taste, and could arguably use some more diagrams (though no one else in the reviews has expressed such a view, so maybe that's just my problem). But this is partly offset by the large number of detailed examples.Another plus: this is one of the few texts I've seen that treats the Bernoulli process explicitly - a whole chapter - rather than just starting with the Poisson process. I think this helps create a fuller picture of these processes, as the Bernoulli is essentially the discrete time analog (no "anti" pun intended!) of the Poisson.The text goes on to present a very detailed treatment of Markov process in both discrete and continuous time, including a chapter on optimal stopping, which is not often treated at this level. You will find detailed treatments of branching and queuing models, renewal theory, and really just about everything that can be treated without measure theory. This is probably the best reference available on the subject at this level, especially in terms of content-to-price ratio.Although I would supplement this book with a more elementary treatment (such as the excellent albeit pricey Bertsekas text, which contains some very easy to read chapters on stochastic processes), it is a valuable addition to the Dover catalog and should not be missed.

IMHO, the chapter on Poisson processes is the high point. The 'axiomatic' definition is just terrific, e.g., in practice for justifying that have a Poisson process. The chapter on Bernoulli processes is also nice. The material on Markov processes is quite useful. I wish there'd been a chapter on second order stationary processes, power spectra, Wiener filtering, etc. In practice, that's where most of the utility is.The math part is a bit tough to take: There are a lot of "implicit monotone class arguments"; that is, the author is thinking in terms of measure theory but omitting the measure theory details. So, for most of the math details, can't expect to master those from this book. So, just let the author show an intuitive approach to the technical details -- seeing the intuitive approach is not all bad.I had a course from the book from a star student of the author. I was the student who found the short solution to the test question on branching processes. I actually used the material in a part time job in applied math, estimating the survivability of the US SSBN fleet under a special scenario of global nuclear war limited to sea.It's secure on my bookshelf -- I don't want to be without it.

About what you'd expect from a book about Stochastic Processes.

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