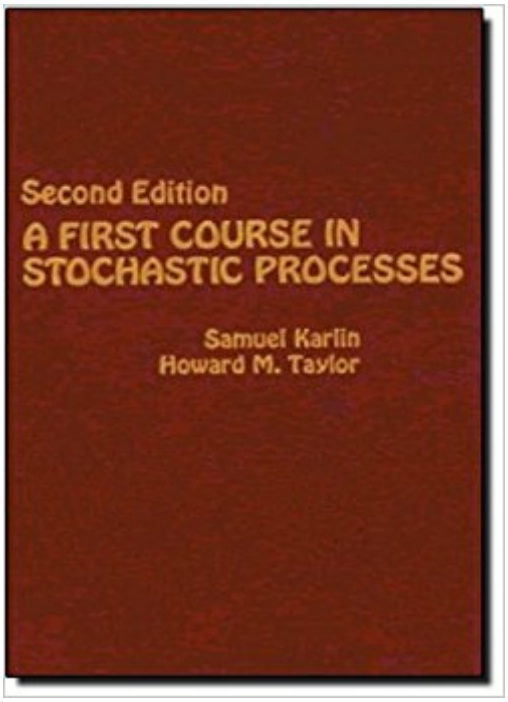
A First Course In Stochastic Processes, Second Edition



Synopsis

The purpose, level, and style of this new edition conform to the tenets set forth in the original preface. The authors continue with their tack of developing simultaneously theory and applications, intertwined so that they refurbish and elucidate each other.The authors have made three main kinds of changes. First, they have enlarged on the topics treated in the first edition. Second, they have added many exercises and problems at the end of each chapter. Third, and most important, they have supplied, in new chapters, broad introductory discussions of several classes of stochastic processes not dealt with in the first edition, notably martingales, renewal and fluctuation phenomena associated with random sums, stationary stochastic processes, and diffusion theory.

Book Information

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Customer Reviews

Howard E. Taylor is a research chemist with the National Research Program, Water Resources Division, U.S. Geological Survey located in Boulder, Colorado. Dr. Taylor has played a major role over the past 25 years in the development of plasma spectrometric techniques in analytical chemistry, as reflected in his more than 150 technical publications and the presentation of numerous papers at national and international technical meetings. He has served as faculty affiliate at Colorado State University and has taught American Chemical Society Short Courses for more than 15 years.

fine study

Good

I am quite enjoying this book. The mathematics is meticulous. As the motivation for some material has not always been clear, I have found it helpful to study this text along side two others: One is Feller - "An Introduction to Probability Theory and its Applications, volume 1." Feller is great in providing deep insight into how the mathematics arises from the nature of the problem and its formulation. Additionally, Feller provides innumerable examples that help. Pay special attention to chapters 11 and 13 of Feller - those on generating functions and recurrent events and renewal theory, respectively. Feller's intuitive derivation of many of the equations are very helpful. Feller also provides a nice chapter (15) on Markov chains.Another useful text, I have found, is Karlin's later text, "An Introduction to Stochastic Modeling." This text is more elementary. However, it often provides insight and explanations to material that "A First Course" omits.The analysis mathematics background required for "A First Course in Stochastic Processes" is equivalent to the analysis one gets from 'baby' Rudin, chapters 1 - 7, say. Those are enough I think. A decent probability course is useful, of course.Read chapters 11 and 13 from Feller first. Then jump into Karlin. It's a challenging but an enjoyable experience.

Sam Karlin is a well known Professor of Mathematics at Stanford University. Karlin and Taylor have teamed up for three excellent texts on stochastic processes. I am commenting on the first edition of the book as that was the one I used as a graduate student at Stanford. Of the books I have read that are introductory first courses in stochastic processes this one is not the easiest to read and the exercises at the end of the chapters are challenging.For my first course in Stochastic Processes my instructor chose Hoel, Port and Stone which provides a more systematic treatment building up from basic results about Markov chains. Maybe Karlin and Taylor's book should be used as a second course in stochastic processes and their sequel for a third course.For those readers who are mathematically inclined and want to see proofs of theorems, this is the book to get. It does not go into stochastic calculus or go very deeply into Brownian motion. But unlike most introductory courses it does cover Martingales and Brownian Motion. Stochastic calculus and a deep description of Brownian motion are topics that are rightfully saved their book titled "A Second Course in Stochastic Processes."One reviewer gave the book a bad rating and complained about the typesetter. I find that to be a little too superficial of a criticism to give the book a poor rating. A lot of thought and hard work is put in by the distinguished authors. My rating is four stars because

although it is an excellent text that is often used for grsduate school studies in mathematics or statistics, it is not the easiest to read or the most systematic.

This book was published back in the 70s, before the advent of LaTeX. And it shows. In particular, it is no good as a reference for this reason: each time you try to look something up, the page is too overcrowded with symbols to find what you're looking for. In addition, to use this book to learn stochastic processes puts you through a whole lot more trouble than you'll probably need. Each deduction in the book is long, boring, and hard. Since I've read other books which are not, I'm going to assume it's the fault of the authors and their lack of LaTeX.This book, not unlike quite a few in probability and statistics (e.g. Billingsley), is popular because old professors used it and don't bother to find a new one.

A remarkable well organised work. Every chapter contains all needed definitions and formulas, deep discussions of their meanings, proofs, and examples, all extraordinarily well blended. Also every chapter has two set of problems. The 'elementary problems' require applying the material covered. The 'problems' require to prove results, they provide an excellent ground to develop this skill. Some times the classic format proof-theorem is used, but usually the ideas flow: starting with a problem, introducing necessary definitions and finding a solution eventually a theorem is stated as a natural consequence.The writing style is similar to the immortal 'Introduction to Probability Theory' and its Applications' by Feller, with a similar mixture of rigorous mathematics and probabilistic intuition. Though 'A First Course...' only reviews the basics, it has some common topics with Feller's and covers more advanced topics.The style of the book is the perfect opposite of 'Introduction to probability Models' by Sheldon Ross, which is written in a much more flamboyant style, full of surprises and amazement, and requires the constant use of pencil and paper to follow the developments. These two sources can be combined to master the subject, despite the fact that students often find Ross's magnificent work too hard to follow. (Of course, some will say that it is a bad book, and that the professor can't teach...)Even though 'A First Course...' is rarely used as a textbook (bad marketing?) after taking courses on multivariable calculus and basic probability, an undergraduate student is ready to read this book. Measure theory is barely used, and it is a surprise to see how far can one go using only probabilistic intuition. The book is also well suited to doctoral courses.The consecutive chapters on Martingales and Brownian Motion are unparalleled, a unique collection of basic examples is used to illustrate results on Stopping Times and Convergence. Also, Measure Theory is introduced at this point in a very appealing manner. These concepts are then

used to obtain classical results on Brownian Motion and other topics. Students interested in Stochastic Calculus (not covered in this book) and its many application in Finances, Engineering, Operations Research and Computer Science can acquire solid foundations here.The chapter on Stationary Processes is also very special, it provides solid foundations for Econometrics and Time Series and it is often quoted in research papers.In short: an excellent book to acquire solid foundations on Stochastic Processes, the only source I know for a simple and systematic introduction of certain topics.

A First Course in Stochastic Processes, Second Edition Stochastic Simulation: Algorithms and Analysis (Stochastic Modelling and Applied Probability, No. 57) (No. 100) Continuous-time Stochastic Control and Optimization with Financial Applications (Stochastic Modelling and Applied Probability) Markov Processes for Stochastic Modeling, Second Edition (Elsevier Insights) Fundamentals of Probability, with Stochastic Processes (3rd Edition) Stochastic Processes in Physics and Chemistry, Third Edition (North-Holland Personal Library) Stochastic Processes: Theory for Applications Stochastic Processes Introduction to Stochastic Processes (Dover Books on Mathematics) Probability, Statistics, and Stochastic Processes Essentials of Stochastic Processes (Springer Texts in Statistics) Applied Probability and Stochastic Processes Probability and Stochastic Processes Multidimensional Stochastic Processes as Rough Paths: Theory and Applications (Cambridge Studies in Advanced Mathematics) Stochastic Processes (Dover Books on Mathematics) Introduction to Stochastic Processes (Chapman & Hall/CRC Probability Series) Introduction to Stochastic Processes with R Stationary and Related Stochastic Processes: Sample Function Properties and Their Applications (Dover Books on Mathematics) Stochastic Processes With Applications (Classics in Applied Mathematics) How to Gamble If You Must: Inequalities for Stochastic Processes (Dover Books on Mathematics)