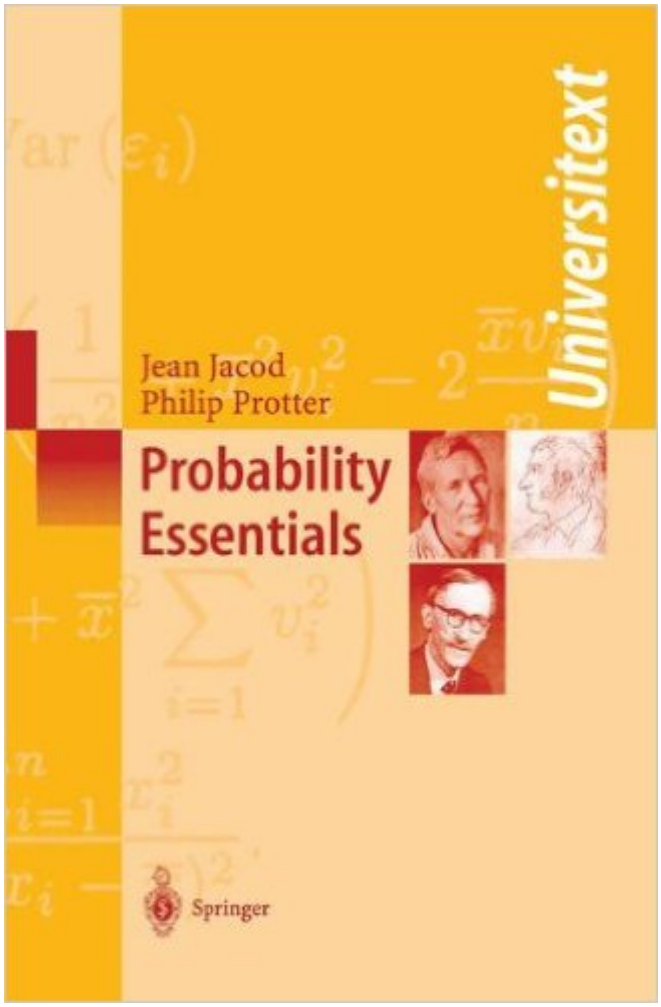
# Probability Essentials



## Synopsis

This introduction can be used, at the beginning graduate level, for a one-semester course on probability theory or for self-direction without benefit of a formal course; the measure theory needed is developed in the text. It will also be useful for students and teachers in related areas such as finance theory, electrical engineering, and operations research. The text covers the essentials in a directed and lean way with 28 short chapters, and assumes only an undergraduate background in mathematics. Readers are taken right up to a knowledge of the basics of Martingale Theory, and the interested student will be ready to continue with the study of more advanced topics, such as Brownian Motion and Ito Calculus, or Statistical Inference.

## Book Information

Series: Universitext

Paperback: 254 pages

Publisher: Springer; 2nd edition (October 4, 2013)

Language: English

ISBN-10: 3540438718

ISBN-13: 978-3540438717

Product Dimensions: 6.1 x 0.6 x 9.2 inches

Shipping Weight: 1.1 pounds (View shipping rates and policies)

Average Customer Review: 4.1 out of 5 starsÂ Â See all reviewsÂ (9 customer reviews)

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## Customer Reviews

As far as beginning graduate-level books on probability are concerned this is definitely one of the best. This looks like a set of lectures turned into a book.The competition in my mind would beFirst Look at Rigorous Probability Theory (more compact, perhaps a little dense)Probability & Measure Theory, Second Edition (covers more ground and is very clear)A Course in Probability Theory, Revised Edition, Second Edition(very detailed explanations, but you should probably have followed a course on measure theory)Please dont dive into probability at this level, your intuition might not be ready for it.To do that I recommendAn Introduction to Probability Theory and Its Applications, Vol. 1 (Volume 1) (if you have the time)There is also Basic Probability Theory (Dover Books on Mathematics) which is an excellent introduction stopping short of measure theory.

This is an excellent and timely textbook on probability and martingale theory. There is an increasing need of thorough but concise treatise of probability theory for researchers and graduate students in Engineering, Economics, Statistics and Mathematical Biology. Very few textbook fill this need. Jacod and Protter succeeded in bringing together essential concepts and theorems in probability/martingale theory in a clear and lucid style and the book is completely self-contained: all necessary machinery from measure theory are explained and proved while providing a flavor of probabilistic way of thinking. Unlike Williams' "Probability with Martingales", all mathematical details are covered in the body of text. They present conditional expectation through Hilbert space approach and Radon-Nikodym theorem is proved at the end of the book using martingales. This is an indoctrinated way of showing how martingales are applied in other field of mathematics. Each chapter starts with pedagogical explanation of concept and summary of results. This helps reader grasp concepts and develop intuition. The topics, examples and exercises are carefully chosen and well organized. I found several but minor typos and discrepancy in the notation during the last five chapters. Yes, elegant proof is given for each theorem on martingales but rephrasing them may help make it clear where in the proof previous results are used and applied. Also, it would be a great idea to include introductory texts on stochastic calculus in the reference for the beginning students. Despite these minor suggestions, I recommend the book with enthusiasm. After reading this book, one can take their way immediately to stochastic calculus: Brownian motion and Ito calculus and their applications.

The opening chapters (1-6) provide a decent and readable introduction to key concepts in measure theory: sigma-algebras, (probability) measures, random variables, etc. However, the middle and later chapters are written like lecture notes --definition, theorem, proof; theorem proof; theorem, proof, corollary -- with little motivation or explanation of relevance to measure theoretic probability, i.e. the lecturer would provide such motivations and explanations (unfortunately the book does not come with a lecturer). The chapters on martingales are thorough--but read like a reference rather than a text-- and the token chapter on the Radon-Nikodym theorem fails to capture its importance in measure theoretic probability. Overall, this book serves as a decent introduction, but I would recommend supplementing the material with corresponding material from e.g. Ash's Probability and Measure Theory or Billingsley's Probability and Measure.

This is Springer's attempt at Cliff's Notes? As others have pointed out, it is essentially a set of

summary notes, not a real book. At a price level just a little higher, you can get much better ones.

the statistics lecturer at my university recommended this book, and they choose to purchase it for my studies. The book holds a lot of information, and is definitely worthwhile for those who are interested in numbers. Formulas are well explained and properly documented through methodical examples.