



Probability Theory: An Analytic View

By Daniel W. Stroock

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This second edition of Daniel W. Stroock's text is suitable for first-year graduate students with a good grasp of introductory, undergraduate probability theory and a sound grounding in analysis. It is intended to provide readers with an introduction to probability theory and the analytic ideas and tools on which the modern theory relies. It includes more than 750 exercises. Much of the content has undergone significant revision. In particular, the treatment of Levy processes has been rewritten, and a detailed account of Gaussian measures on a Banach space is given. The first part of the book deals with independent random variables, Central Limit phenomena, and the construction of Levy processes, including Brownian motion. Conditioning is developed and applied to discrete parameter martingales in Chapter 5, Chapter 6 contains the ergodic theorem and Burkholder's inequality, and continuous parameter martingales are discussed in Chapter 7. Chapter 8 is devoted to Gaussian measures on a Banach space, where they are treated from the abstract Wiener space perspective. The abstract theory of weak convergence is developed in Chapter 9, which ends with a proof of Donsker's Invariance Principle. The concluding two chapters contain applications of Brownian motion to the analysis of partial differential equations and potential theory.

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Probability Theory: An Analytic View By Daniel W. Stroock Bibliography

- Sales Rank: #2281814 in Books
- Published on: 2010-12-31
- Released on: 2011-03-10
- Original language: English
- Number of items: 1
- Dimensions: 9.96" h x 1.10" w x 8.46" l, 2.02 pounds
- Binding: Paperback
- 548 pages

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Alexander Tzanov, Computing Reviews

About the Author

Dr Daniel W. Stroock is the Simons Professor of Mathematics Emeritus at the Massachusetts Institute of Technology. He has published numerous articles and is the author of six books, most recently *Partial Differential Equations for Probabilists* (2008).

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