1. Record Nr. UNINA9910254079403321

| | |
|---|---|
| Autore | Bhattacharya Rabi |
| Titolo | A Basic Course in Probability Theory / / by Rabi Bhattacharya, Edward C. Waymire |
| Pubbl/distr/stampa | Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016 |
| ISBN | 3-319-47974-1 |
| Edizione | [2nd ed. 2016.] |
| Descrizione fisica | 1 online resource (XII, 265 p.) |
| Collana | Universitext, , 0172-5939 |
| Disciplina | 519.2 |
| Soggetti | Probabilities<br>Measure theory<br>Probability Theory and Stochastic Processes<br>Measure and Integration |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Preface to Second Edition -- Preface to First Edition -- I. Random Maps, Distribution, and Mathematical Expectation -- II. Independence, Conditional Expectation -- III. Martingales and Stopping Times -- IV. Classical Central Limit Theorems -- V. Classical Zero-One Laws, Laws of Large Numbers and Large Deviations -- VI. Fourier Series, Fourier Transform, and Characteristic Functions -- VII. Weak Convergence of Probability Measures on Metric Spaces -- VIII. Random Series of Independent Summands -- IX. Kolmogorov's Extension Theorem and Brownian Motion -- X. Brownian Motion: The LIL and Some Fine-Scale Properties -- XI. Strong Markov Property, Skorokhod Embedding and Donsker's Invariance Principle -- XII. A Historical Note on Brownian Motion -- XIII. Some Elements of the Theory of Markov Processes and their Convergence to Equilibrium -- A. Measure and Integration -- B. Topology and Function Spaces -- C. Hilbert Spaces and Applications in Measure Theory -- References -- Symbol Index -- Subject Index. |
| Sommario/riassunto | This text develops the necessary background in probability theory underlying diverse treatments of stochastic processes and their wide-ranging applications. In this second edition, the text has been reorganized for didactic purposes, new exercises have been added and basic theory has been expanded. General Markov dependent sequences |

and their convergence to equilibrium is the subject of an entirely new chapter. The introduction of conditional expectation and conditional probability very early in the text maintains the pedagogic innovation of the first edition; conditional expectation is illustrated in detail in the context of an expanded treatment of martingales, the Markov property, and the strong Markov property. Weak convergence of probabilities on metric spaces and Brownian motion are two topics to highlight. A selection of large deviation and/or concentration inequalities ranging from those of Chebyshev, Cramer–Chernoff, Bahadur–Rao, to Hoeffding have been added, with illustrative comparisons of their use in practice. This also includes a treatment of the Berry–Esseen error estimate in the central limit theorem. The authors assume mathematical maturity at a graduate level; otherwise the book is suitable for students with varying levels of background in analysis and measure theory. For the reader who needs refreshers, theorems from analysis and measure theory used in the main text are provided in comprehensive appendices, along with their proofs, for ease of reference. Rabi Bhattacharya is Professor of Mathematics at the University of Arizona. Edward Waymire is Professor of Mathematics at Oregon State University. Both authors have co-authored numerous books, including a series of four upcoming graduate textbooks in stochastic processes with applications.