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Nota di contenuto	Introductory Stochastic Analysis for Finance and InsuranceIntroductory Stochastic Analysis for Finance and Insurance; CONTENTS; List of Figures; List of Tables; Preface; 1 Introduction; 2 Overview of Probability Theory; 2.1 Probability Spaces and Information Structures; 2.2 Random Variables, Moments and Transforms; LIST OF FIGURES; 2.1. The price of a stock over a two-day period.; 2.3 Multivariate Distributions; 2.4 Conditional Probability and Conditional Distributions; 2.2. The probability tree of the stock price over a two-day period.; 2.5 Conditional Expectation 2.3. The expectation tree of the stock price over a two-day period.2.6 The Central Limit Theorem; 3 Discrete-Time Stochastic Processes; 3.1 Stochastic Processes and Information Structures; 3.2 Random Walks;

3.1. The tree of a standard random walk.; 3.2. The binomial model of the stock price.; 3.3 Discrete-Time Markov Chains; 3.3. The binomial tree of the stock price.; 3.4 Martingales and Change of Probability Measure; 3.5 Stopping Times; 3.6 Option Pricing with Binomial Models; 3.4. The returns of a stock and a bond.; 3.5. The payoff function of a call.; 3.6. The payoff function of a put.
3.7. The payoff function of a strangle.3.7 Binomial Interest Rate Models; LIST OF TABLES; 3.1. A sample of quotes on U.S. Treasuries.; 3.8. Treasury yield curve, Treasury zero curve, and Treasury forward rate curve based on the quotes in Table 3.1.; 3.2. The market term structure.; 3.9. Constructing a short rate tree: step one.; 3.10. Constructing a short rate tree: step two.; 3.11. The complete short rate tree.; 4 Continuous-Time Stochastic Processes; 4.1 General Description of Continuous-Time Stochastic Processes; 4.2 Brownian Motion
4.1. A sample path of standard Brownian motion (= 0 and = 1).4.3 The Reflection Principle and Barrier Hitting Probabilities; 4.2. A sample path of Brownian motion with = 1 and = 1.; 4.3. A sample path of Brownian motion with = -1 and = 1.; 4.4. A sample path of Brownian motion with = 0 and = 2.; 4.5. A sample path of Brownian motion with = 0 and = 0.5.; 4.6. A path of standard Brownian motion reflected after hitting.; 4.7. A path of standard Brownian motion reflected before hitting.; 4.4 The Poisson Process and Compound Poisson Process
4.8. A sample path of a compound Poisson process.4.9. A sample path of the shifted Poisson process {X(t)}.; 4.5 Martingales; 4.6 Stopping Times and the Optional Sampling Theorem; 5 Stochastic Calculus: Basic Topics; 5.1 Stochastic (Ito) Integration; 5.2 Stochastic Differential Equations; 5.3 One-Dimensional Ito's Lemma; 5.1. The product rules in stochastic calculus.; 5.4 Continuous-Time Interest Rate Models; 5.5 The Black-Scholes Model and Option Pricing Formula; 5.6 The Stochastic Version of Integration by Parts; 5.7 Exponential Martingales; 5.8 The Martingale Representation Theorem
6 Stochastic Calculus: Advanced Topics

Sommario/riassunto

Incorporates the many tools needed for modeling and pricing in finance and insuranceIntroductory Stochastic Analysis for Finance and Insurance introduces readers to the topics needed to master and use basic stochastic analysis techniques for mathematical finance. The author presents the theories of stochastic processes and stochastic calculus and provides the necessary tools for modeling and pricing in finance and insurance. Practical in focus, the book's emphasis is on application, intuition, and computation, rather than theory. Consequently, the text is of interest to graduate