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	Soggetti	Probabilities
		Mathematical analysis
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		Mathematical physics
		Engineering mathematics
		Engineering - Data processing
		Probability Theory
		Analysis
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	Nota di contenuto	1. Probability and Statistics -- 2. Probability and Stochastic Processes -- 3. Ito Stochastic Calculus -- 4. Stochastic Differential Equations -- 5. Stochastic Taylor Expansions -- 6. Modelling with Stochastic Differential Equations -- 7. Applications of Stochastic Differential Equations -- 8. Time Discrete Approximation of Deterministic Differential Equations -- 9. Introduction to Stochastic Time Discrete Approximation -- 10. Strong Taylor Approximations -- 11. Explicit Strong Approximations -- 12. Implicit Strong Approximations -- 13. Selected Applications of Strong Approximations -- 14. Weak Taylor

Approximations -- 15. Explicit and Implicit Weak Approximations --
16. Variance Reduction Methods -- 17. Selected Applications of Weak
Approximations -- Solutions of Exercises -- Bibliographical Notes.

Sommario/riassunto	The numerical analysis of stochastic differential equations differs significantly from that of ordinary differential equations due to peculiarities of stochastic calculus. This book provides an introduction to stochastic calculus and stochastic differential equations, in both theory and applications, emphasising the numerical methods needed to solve such equations. It assumes of the reader an undergraduate background in mathematical methods typical of engineers and physicists, though many chapters begin with a descriptive summary. The book is also accessible to others who only require numerical recipes. The stochastic Taylor expansion provides the basis for the discrete time numerical methods for differential equations. The book presents many new results on high-order methods for strong sample path approximations and for weak functional approximations, including implicit, predictor-corrector, extra-polation and variance-reduction methods. Besides serving as a basic text on such methods, the book offers the reader ready access to a large number of potential research problems in a field that is just beginning to expand rapidly and is widely applicable. To help the reader to develop an intuitive understanding of the underlying mathematics and hand-on numerical skills, exercises and over 100 PC-Exercises are included.