

Bouleau, Nicolas

Processus stochastiques et applications. (Stochastic processes and applications). (French)

Zbl 0704.60001

Paris: Hermann. 347 p. FF 180.00 (1988).

Of course, this book is not the first one which deals with stochastic processes. The purpose here is to present the principal areas in random processes, with emphasis on engineering applications. The required background is a basic knowledge in elementary probability theory. Readers may be either students in applied mathematics, or engineers, or research workers.

Every chapter ends with short exercises, longer problems and at least one exposition of a concrete application. In the first introductory chapter, the reader is already acquainted with three applications to engineering problems: Kalman filtering, Robbins-Monro approximation, financial option pricing. The following chapters present the core of the theory of usual stochastic processes: Markov chains, jump processes including queueing models, processes with independent increments such as Brownian motion, prediction and filtering of stationary processes, both with continuous or discrete time. The three last chapters concern the theory of Itô calculus and Markov processes with their infinitesimal operators and the Kolmogorov equations; the Ornstein-Uhlenbeck process is subject to special attention, and an application to financial stochastic analysis is expounded.

This book achieves perfectly the objective of the author: to make available in one volume the main part of the up-to-date theory of stochastic processes in symbiosis with their applications. To avoid long and tedious details, some proofs are omitted or only sketched, but convenient references are provided in that case. It may be recommended to a large public. To conclude, let us formulate yet two slight regrets: there are too many misprints, and a few pages about martingale theory would have been welcome, because martingales show their face in many places.

Reviewer: [D.Lepingle](#)

MSC:

- [60-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to probability theory
- [60Gxx](#) Stochastic processes
- [60Hxx](#) Stochastic analysis
- [60Jxx](#) Markov processes

Cited in 7 Documents

Keywords:

[engineering applications](#); [Kalman filtering](#); [Robbins-Monro approximation](#); [financial option pricing](#); [martingale theory](#)