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STOCHASTIC PROCESSES. ELEMENTS OF THEORY AND APPLICATIONS
(in Romanian)

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The reviewed work is a valuable publication, devoted to the presentation, at the present-day scientific level, of a series of general elements of the stochastic processes theory. It belongs to a series of synthesis works, written in various topical fileds of the theory of probabilities and mathematical statistics, with the direct participation of academician professor Gheorghe Mihoc.

As a matter of fact, in the most different branches of nature's and society's sciences, in nearly all fileds of modern techniques and technologies, in the contemporary practical activities, the theory of stochastic processes arouses an ever increasing interest for this fundamental research direction in the field of the theory of probabilities.

This works fills a long-term gap in our speciality literature. This is the more so as the authors successfully discerned the most important theoretical results concerning the stochastic processes and presented them in a clear way. The work is accessible to a wide circle of readers, economists, statisticians, specialists from the management and planning fields, students — all of them having knowledge of the theory of probabilities at the usual level in higher education, economic or technical.

The practical illustrations of the presented theories, models and methods, the numerous examples and applications in various fields, especially in the filed of economic sciences and practice or of their connected sciences, are equally valuable.

Chapter 1 presents the fundamental definitions, the most important classes of stochastic processes and then some basic methods used in studying the stochastic processes as ramified processes, Poisson's processes and Brownian movement processe, accompanied by some applitions and relevant examples.

Chapter 2 deals with renewal processes, especially important when studying the administration of the production equipments in the economy. The authors achieve an elaborate synthesis, accompanied by numerous interesting examples, of the fundamental concepts, as for instance: determination of the process distribution function, lifetime of the component being on duty at a given moment and the residual life-time of the component, the renewal function, renewal chains, stochastic processes associated to a renewal process.

Special attention is paid to the decision-making Markoff chains, to their numerous applications in various fields (medecine, biology and physics, statistic control of production quality, theory of stocks, labyrinth's problem).

Chapters 4 and 5, closely connected between them, were devoted to the problem put by the birth and death processes of various types, or of processes taking place within the activities concerning the scientific promotion of state and social insurances, respectively. The waiting line theory, with numerous applications in economy, is also presented in the same context.

The reader finds extremely useful considerations in connexion with the mortality tables and their utilization in various socio-economic researches. The ample and rich synthesis carried out by the authors on the theory of stochastic processes as applied to insurances is worthy of mention. The rich practical experience of the authors in this field was turned to account in a successful manner, as theoretical results can be also understood by a wide readership of non-mathematicians.

The object of the last chapter is the application of stochastic processes to the study of dynamic series. After presenting the main results accumulated when studying stationary stochastic processes, a detalied results accumulated when studying stationary stochastic processes, a detailed methodology is presented for processing and interpreting dynamic series frequently encountered in the socio-economic field.

A first application refers to a dynamic series non affected by seasonal variations, concering the dynamic wheat and rye production in the Socialist Republic of Romania in the 1950—1975 time period.

The second application regards the analysis of a dynamic series with seasonal variations, the exemplification being done with the dynamics of marriages in Romania during the decade 1964—1973.

These applications may be useful to statisticians as a guide, when analysing various dynamic series, carrying economic or social information. As a matter of fact, the same thing can be said also about the other applications solved in the book.

Undoubtedly, the work could have been more effective, if besides the manual computation methods, it contained also informational computation procedures, which are necessary to analyse the treated models.

Unquestionably, the reader — from any activity field or branch of science — finds in this valuable work a guide for using stochastic processes methods and models. These methods and models are becoming very useful, even indispensable to promote the new, to understand more completely and more profoundly the reality, to improve one's activity.

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