Peter W. Jones and Peter Smith, Stochastic Processes: An Introduction Chapmann & Hall, Boca Raton, 2010, 2nd edition, x + 221 pp., ISBN 978-1-4200-9960-7

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The book gives an introduction to central aspects of stochastic processes. It is intended to be useful for students with varied academic interests and includes a lot of applications and examples from different areas, e.g. from gambling problems, engineering, medicine and biology. The targeted readership is students in mathematics or statistics in the second year. It is assumed that readers have encountered the first-year courses in calculus and matrix algebra and have a basic knowledge in probability. The intention is that the content is appropriate for a one-semester course.

This book consists of 10 chapters. After giving some background on probability in Chapter 1, Chapter 2 deals with gambling problems. The probability of ruin or the duration of games are discussed. Random walks are the subject of Chapter 3, while Chapter 4 introduces main aspects of the theory of markov chains, e.g. states and transition probabilities.

The book then continues with processes in continuous time, first with poisson processes in Chapter 5. In Chapter 6, one reads about birth and death processes and general population models. Queues are the subject of Chapter 7. Here, the authors deal with the analysis of the long-term behavior of queues in different versions - queues with multiple servers or with fixed service times. Chapter 8 discusses aspects of the reliability and renewal theory, e.g. the hazard function is introduced here. Chapter 9 deals with branching processes, i.e. with processes that are concerned with the generational growth and decay of populations. It also contains martingales and a simple epidemic. Finally, the 10th and last chapter suggests projects to work on at the computer; often one has to make simulations or plots. Mathematica and in some cases R code for these programmes is provided on the book's web site.

The focus of this book is on giving a clear, easily understandable and rather short overview on stochastic processes. The different topics are motivated very well, there are many graphs and 50 - theoretical and practical - examples. The book does not have the aim to go into mathematical details very deeply, i.e. it does not contain any measure theory and is not structured by theorems and proofs. Nevertheless, the book is written very carefully and one needs a solid mathematical background to be able to understand it.

After each chapter there are exercises to work on; in the whole, the book contains 205 questions. Often, the reader has to work on practical problems or calculate e.g. an expected value. In the end of the book, the reader finds solutions for many of the questions.

To summarize, this book introduces the theory of stochastic processes very well. It makes the reading for people who have not dealt with the topic that much before as easy as possible by omitting less important details. Graduates who are interested in theoretical research on this topic and who need more special information will perhaps read other textbooks, but for beginners, one could not imagine a better book.

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