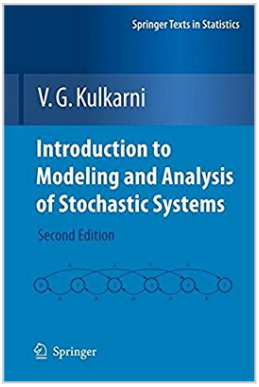

Introduction to Modeling and Analysis of Stochastic Systems (Springer Texts in Statistics)

By V. G. Kulkarni

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This book provides a self-contained review of all the relevant topics in probability theory. A software package called MAXIM, which runs on MATLAB, is made available for downloading. Vidyadhar G. Kulkarni is Professor of Operations Research at the University of North Carolina at Chapel Hill.

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Editorial Review

Review

From the reviews of the second edition:

“The author has added a new chapter on Poisson processes and another one on Brownian motion. The discussion is kept on an elementary level and does not require any knowledge from measure theory or advanced calculus. … the text is suitable for an undergraduate course on probabilistic modeling for students from physics, engineering, operations research, computer science, business administration or some related field that needs advanced modeling techniques.” (H. M. Mai, Zentralblatt MATH, Vol. 1222, 2011)

“Suitable for undergraduates in Mathematics, Statistics, Operations Research, Computer Science, Business Administration, Public Policy, etc. This is a very clear and readable text on Markov chains, Poisson processes, continuous time Markov chains, renewal processes, and queuing processes. … The treatment is very clear, intuitive as well as rigorous, without being pedantic, and full of interesting examples and case studies. … The book should be fun to teach from and learn from.” (Jayanta K. Ghosh, International Statistical Review, Vol. 80 (3), 2012)

From the Back Cover
This is an introductory-level text on stochastic modeling. It is suited for undergraduate students in engineering, operations research, statistics, mathematics, actuarial science, business management, computer science, and public policy. It employs a large number of examples to teach the students to use stochastic models of real-life systems to predict their performance, and use this analysis to design better systems. The book is devoted to the study of important classes of stochastic processes: discrete and continuous time Markov processes, Poisson processes, renewal and regenerative processes, semi-Markov processes, queueing models, and diffusion processes. The book systematically studies the short-term and the long-term behavior, cost/reward models, and first passage times. All the material is illustrated with many examples, and case studies. The book provides a concise review of probability in the appendix. The book emphasizes numerical answers to the problems. A collection of MATLAB programs to accompany the this book can be downloaded from http://www.unc.edu/~vkulkarn/Maxim/maxim.zip. A graphical user interface to access the above files can be downloaded from http://www.unc.edu/~vkulkarn/Maxim/maximgui.zip . The second edition incorporates several changes. First its title reflects the changes in content: the chapters on design and control have been removed. The book now contains several case studies that teach the design principles. Two new chapters have been added. The new chapter on Poisson processes gives more attention to this important class of stochastic processes than the first edition did. The new chapter on Brownian motion reflects its increasing importance as an appropriate model for a variety of real-life situations, including finance. V. G. Kulkarni is Professor in the Department of Statistics and Operations Research in the University of North Carolina, Chapel Hill. He has authored a graduate-level text Modeling and Analysis of Stochastic Systems and dozens of articles on stochastic models of queues, computer and communications systems, and production and supply chain systems. He holds a patent on traffic management in telecommunication networks, and has served on the editorial boards of Operations Research Letters, Stochastic Models, and Queueing Systems and Their Applications.

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