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Book Reviews

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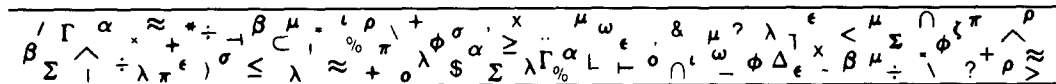


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Book Reviews

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The range of books reviewed is wide, covering theory and applications in operations research, statistics, econometrics, mathematics, computers, and information systems (no software is reviewed). In addition, we include books in other fields that emphasize technical applications. Publishers who wish to have their books and proceedings reviewed should send them to Professor Benjamin Lev. We list the books and proceedings received; not all books received can be reviewed because space and time are limited. Those who would like to review books are urged to send me their names, addresses, and specific areas of expertise. We commission all reviews and do not accept unsolicited book reviews. Readers are encouraged to suggest books that might be reviewed or to ask publishers to send me copies of such books.

GALLAGER, ROBERT G. 1996, *Discrete Stochastic Processes*, Kluwer Academic Publishers, Norwell, Massachusetts, 271 pp., \$61.00.

This book belongs to the Kluwer International Series in Engineering and Computer Science within a subdivision called Communications and Information Theory. The author, Robert G. Gallager, states that the purpose of the book is "to help students develop the understanding and intuition necessary to apply stochastic processes to problems in engineering, science, and operations research." In doing this, Gallager aims to use only the minimal

amount of mathematics necessary to achieve the desired level of understanding. Hence, mathematical rigor is not an essential requirement, and he does not use measure theory and requires only a small amount of mathematical analysis.

In common with the authors of most other student texts on stochastic processes, Gallager illustrates the concepts using a large number of small-scale examples, rather than describing and analyzing larger, real-life case studies. Indeed, Gallager strongly disapproves of the case study method, describing it as "inappropriate for understanding stochastic pro-

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cesses (and similarly inappropriate for any field that has a rich and highly cohesive mathematical structure)." I do not subscribe fully to this point of view. The field of OR education happens to be well served by books covering the theory of our subject in great detail—many of them, like the present book, extremely well written by experts in their field—but effectively ignoring real-life applications. The teaching of OR is also about motivating students to see the relevance of the theory to real-life problems, about the ways in which physical, economic, and political constraints often dictate the sort of model that can be built in practice, and about the limitations of working with inadequate sources of data; issues that can be tackled effectively only by looking at case studies. In partial justification for his point of view, Gallager goes on to say that the potential application areas of stochastic processes are too broad and their structure too deep to allow the theory and case studies to be covered in one book.

The topics covered are fairly standard for an introductory text, the chapter headings being (1) "Introduction and probability review," (2) "Poisson processes," (3) "Renewal processes," (4) "Finite state Markov chains," (5) "Markov chains with countably infinite state spaces," (6) "Markov processes with countable state spaces," and (7) "Random walks and martingales." The organization of the book owes much to the works of Feller [1966, 1968] and Ross [1983].

Gallager writes unashamedly as an engineer for engineers, but this, in my opinion, does not detract at all from the usefulness of the book for students from other

backgrounds. One guiding principle that he adopts is that, in engineering, he believes "it is more important to have a small set of well understood tools than a large collection of general but less intuitive results." Thus, the book contains fewer theorems than comparable texts, but the selected theorems are lavishly illustrated by verbal descriptions, examples of applications, and diagrams. For the student seeking understanding, the ratio of words to equations is refreshingly high. He also suggests that students should put more emphasis on drawing diagrams to reinforce their understanding of concepts, rather than carrying out routine calculations. In this respect, he sets a good example, providing 70 helpful diagrams spread through the seven chapters.

Consistent with the above approach, Gallager does not concentrate much on numerical examples or general computational procedures; only a few of the end-of-chapter exercises involve numbers, the majority being algebraic in nature. He uses transforms only sparingly because "along with simplifying computational work, they frequently obscure underlying probabilistic insights." This must be a strongly held view, given the fact that engineering students are usually well trained in the use of transforms. For example, in considering the equilibrium distribution of the number of customers in the M/G/1 queue, Gallager avoids the usual approach based on transforms and gives instead a method for explicitly calculating the transition probabilities for the embedded Markov chain.

Overall, this is a very good book that will help students to understand many of

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the concepts used in describing stochastic processes. I recommend it highly either as a main text or as supplementary reading. For a course covering a somewhat wider range of mathematical and computational issues than this book, it could be used in conjunction with, say, Medhi [1994] or Kulkarni [1995]. The author states in his preface that he wrote the book in the stimulating environment of MIT with its "constant healthy tug of war between theory and applications." If he were to write another book on stochastic processes, it could perhaps be based upon applications (including suitable case studies), so as to complement the theoretical material covered in his present book and also to fill a glaring gap in the student book market.

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DRAGOO, BOB 1995, *Real-Time Profit Management: Making Your Bottom Line a Sure Thing*, John Wiley and Sons, Inc., New York, 204 pp., \$34.95.

In this book, Bob Dragoo, the Ernst and Young LLP National Director of Chemical Consulting, promises a "step-by-step approach for designing and implementing" a

real-time system that uses "cost and profit measures as control variables and as strategic business planning parameters." Unfortunately, he falls far short of delivering on his ambitious promise.

Dragoo begins with a discussion of why traditional financial accounting systems do not provide real-time information that is useful to production managers. He presents the same arguments that have appeared often in the business press over the past 10 years. He joins the chorus by presenting activity-based costing as a solution that will help satisfy production managers' needs. He does not address the many issues of cost identification and allocation that make implementing activity-based cost systems so difficult. Instead, Dragoo glosses over these serious problems and simply assumes that one can generate a continuous profit number for a complex production process.

After a passing glance at the strategic-business-planning and value-chain literature, in chapters 12 and 13, he promises to show how to construct a real-time cost system. The presentation is not clear or detailed and provides insufficient guidance for such a task. For example, the text of chapter 12 seems to disagree with Figures 12.1 and 12.2. These figures show activity-based cost models built on an enterprise-wide relational database. The general ledger appears as only one of 13 inputs to the database. However, the author repeatedly (in this and later chapters) describes activity-based cost information as being extracted from the general ledger.

In the final chapters of the book, the author concludes with a nod to the business reengineering literature. Once again, he

presents nothing new and he fails to bring the business reengineering literature to bear on his theme.

Appendix A contains a case study that is the book's strongest feature. It is a concise and interesting story of the design and implementation of an activity-based cost system. Unfortunately, the case is not sufficiently detailed, nor does it include time-dimension issues. Appendix B, titled "Examples of actual installations," appears to be a random collection of overhead slides from consulting engagement presentations and contributes very little to the book's purpose. The glossary includes definitions that range from the hopelessly vague—relational database defined as "a repository of information that may be accessed by a number of different attributes"—to the blatantly incorrect—cost of goods sold defined as "a common term for manufacturing costs."

Dragoo writes the book in an informal style; however, I found the style irritating. He frequently and abruptly changes from first person to second person; rhetorical questions and parenthetical digressions abound. He uses quotation marks to emphasize at least one word or phrase per page.

This book was very disappointing. The author promises a great deal and delivers very little. The useful content in the book could easily be edited down to the length of a typical magazine article.

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NAHMIA, STEVEN 1997, *Production and Operations Analysis*, third edition, Richard

D. Irwin Publishers, Burr Ridge, Illinois, 858 pp., \$74.65.

A colleague recently lamented that education is one of the few markets in which there is a customer segment that is willing to pay more for less. The ever-increasing number of multihued, enthusiastic, but ever more superficial, textbooks in business seem to be directed to this segment. Happily, this text by Nahmias is not directed to this segment. The third edition is as substantial as ever, yet very readable by any MBA or engineering-undergraduate student. To quote the text, quoting Einstein: "Physics should be explained as simply as possible, but no simpler." Nahmias follows this philosophy well. He presents almost all topics in three-part style: (1) motivate the topic or problem with a real-world situation, (2) give the general methodology for solving the problem, (3) illustrate with a well-worked-out example. I have been a satisfied user of the two previous editions. The adjectives that come to mind in describing all three editions are *succinct* and *well crafted*.

For readers familiar with the second edition, the third edition has 50 more pages. Most of the additional pages are devoted to illustrating specific topics with well-chosen industrial examples or "snapshots." The list of firms appearing in these snapshots includes Hewlett-Packard, Kraft, Motorola, Sport Obermeyer, Three-Mile Island Nuclear Plant, United Airlines, US Robotics, Wal-Mart, and Welch's Foods.

In many texts, the introductory chapter is the least interesting and useful. Full of vague platitudes about the importance of the material to be served up in the remain-

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ing chapters, the first chapter is usually something to be saved for that night when insomnia strikes. Here, however, the first chapter, "Strategy and competition," is excellent. Nahmias gives a very succinct overview and evaluation of current issues and philosophies in operations management. The coverage is as unbiased as diplomacy allows. Concepts and issues covered include competing in the global marketplace, quality, supply-chain management, time-based competition, business-process reengineering, just-in-time (JIT), experience curves, and product life cycles.

The 12 chapters in the third edition have essentially the same titles as those in the second, with the exception of chapter 6. "Material requirements planning" has been changed to "Push and pull production control systems: MRP and JIT." The author rewrote this chapter substantially to incorporate the latest ideas in just-in-time inventory management. In chapters 2 through 11, Nahmias covers all the standard POM topics, including forecasting, inventory control, operations and project scheduling, facilities location and layout, quality, and reliability.

Chapter 12, "Recent advances in manufacturing technology and control," is a smorgasbord of short topics. The topics served up include supply-chain management, the bull-whip effect, electronic data interchange, design for manufacturability, flexible manufacturing systems, bottleneck scheduling à la OPT, expert systems and AI, and mass customization.

Technical topics are covered better than in almost any other POM text. About 95 pages of appendices and end-of-chapter

supplements are devoted to such topics as present-value analysis, probability distributions, regression, waiting-line or queuing models, simulation, linear programming, multi-period production planning with the Wagner-Whitin method, multi-product EOQ, and forecast-error analysis. With the exception of the Box-Jenkins forecasting methodology, the author covers each topic in enough detail that the reader can gain a useful, working knowledge of the topic, beyond just knowing of its existence. This structure allows the instructor substantial freedom in choosing the level of course to teach from this one text.

There may be books that use more colors of the spectrum, but few cover the spectrum of issues in production and operations management as thoroughly and carefully.

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