

Preface to the Fourth Edition

Since the publication of the third edition in 1998, some new developments have occurred. Samuel Karlin died in 2007, leaving a gap at the authorship level and the new designation of authors.

In the fourth edition, we have added two new chapters: Chapter 10 on random evolution and Chapter 11 on characteristic functions. *Random Evolution* denotes a set of stochastic models, which describe continuous motion with piecewise linear sample functions. Explicit formulas are available in the simplest cases. In the general case, one has a central limit theorem, which is pursued more generally in Chapter 11, “Characteristic Functions and Their Applications.” Here the necessary tools from Fourier Analysis are developed and applied when necessary. Many theorems are proved in full detail, while other proofs are sketched—in the spirit of the earlier Chapters 1–9. Complete proofs may be found by consulting the intermediate textbooks listed in the section on further reading. Instructors who have taught from the third edition may be reassured that Chapters 1–9 of the new edition are identical to the corresponding chapters of the new book.

We express our thanks to Michael Perlman of the University of Washington and Russell Lyons of Indiana University for sharing their lists of errata from the third edition. We would also like to thank Craig Evans for useful advice on partial differential equations.

Biographical Note

Samuel Karlin earned his undergraduate degree from the Illinois Institute of Technology and his doctorate from Princeton University in 1947 at age 22. He served on the faculty of Caltech from 1948–1956 before joining the faculty of Stanford University, where he spent the remainder of his career. Karlin made fundamental contributions to mathematical economics, bioinformatics, game theory, evolutionary theory, biomolecular sequence analysis, mathematical population genetics, and total positivity.

Karlin authored 10 books and more than 450 articles. He was a member of the American Academy of Arts and Sciences and the National Academy of Sciences. In 1989, he received the National Medal of Science for his broad and remarkable researches in mathematical analysis, probability theory, and mathematical statistics and in the application of these ideas to mathematical economics, mechanics, and genetics. He died on December 18, 2007.

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