

PREFACE

This book is based on a beginning graduate level course I have taught at Cornell University since 1965. Research developments over the last several years made it necessary to include in the course topics such as stopping times, strong Markov property, martingales in discrete time, regenerative phenomena, and Tauberian theorems. These topics are not only important theoretically, but also provide essential tools to deal with applications. Presentation of this material includes a certain amount of measure theory, but only at an elementary level, not likely to intimidate the serious student.

Also, the presentation of older topics such as stationary processes, Markov chains, Brownian Motion, Poisson process, branching processes, renewal theory, and random walks is updated, using insights gained from research.

Apart from the Brownian Motion and Poisson process, other Lévy processes that occur in applications are also treated. These include the Gaussian, inverse Gaussian, and the randomized Bernoulli random walk. The characteristics of a general Lévy process are also described.

For each class of stochastic processes treated here I have only attempted to describe the conceptual background and derive the basic results. Also, my treatment of applications is for the purpose of illustrating the theoretical results. Several monographs are now available dealing with special classes of stochastic processes and their important applications.

N. U. Prabhu
Ithaca, New York
January, 2007