Preface

This is an introductory textbook covering the mathematics of interest rates, life contingencies and loss models. It is written for students majoring in Actuarial Science, Quantitative Finance, Financial Engineering and Quantitative Risk Management, as well as for students preparing for examinations in Financial Mathematics with various professional actuarial bodies. The users of this book are expected to be familiar with high school algebra, college-level calculus, introductory probability theory and statistical distributions. Part I—Financial Mathematics covers the intuitive reasoning of the mathematics of interest rates and their applications to financial and risk management. In Part II—Actuarial Mathematics, readers are introduced to the analysis of risks in insurance products due to life contingencies and random losses.

In teaching courses in financial and actuarial mathematics for Actuarial Science students, we found that there are few textbooks that cover the mathematics of interest rates, life contingencies and loss models at an introductory level in a mathematically rigorous manner and yet are suitable for adoption as the main text of a one-semester course. For a one-semester course in the mathematics of interest rates, several excellent textbooks are available. Yet students often found the material rather theoretical and asked for more applications and illustrations. This book was written with the intention of meeting our students' (and our own) needs.

We set ourselves the task of writing a textbook that is *concise*, *precise* and *well organized*. We strived to make our explanation and use of terminologies comprehensible to students with little training in finance, and yet introduce them to the applications of mathematics in the financial markets. This is done through the use of many examples related to personal financial management as well as the analysis and management of financial assets. The draft was "tested" on our students, and they contributed in pointing out explanations that were unclear, notations that were inconsistent, and, of course, many typos. For us, this is a most rewarding experience and helps us to think like a student.

This book may be adopted in the following way:

1. as the main text of a one-semester first course in the mathematics of interest rates and actuarial mathematics, using selected chapters and sections (for example, Chapters 1 to 6, parts of Chapter 7, Chapters 9 to 10, and parts of Chapter 11)

2. as the main text of a one-semester first course in the mathematics of interest rates and investments, using all chapters in Part I

3. as a supplementary text of a one-semester first course in actuarial mathematics, using all chapters in Part II

Instructors may request for the Instructors' Manual from the publisher. The Instructors' Manual provides detailed solutions of all exercises in the book, as well as additional exercises and their answers. PowerPoint slides covering all chapters of the book are also obtainable from the publisher.

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