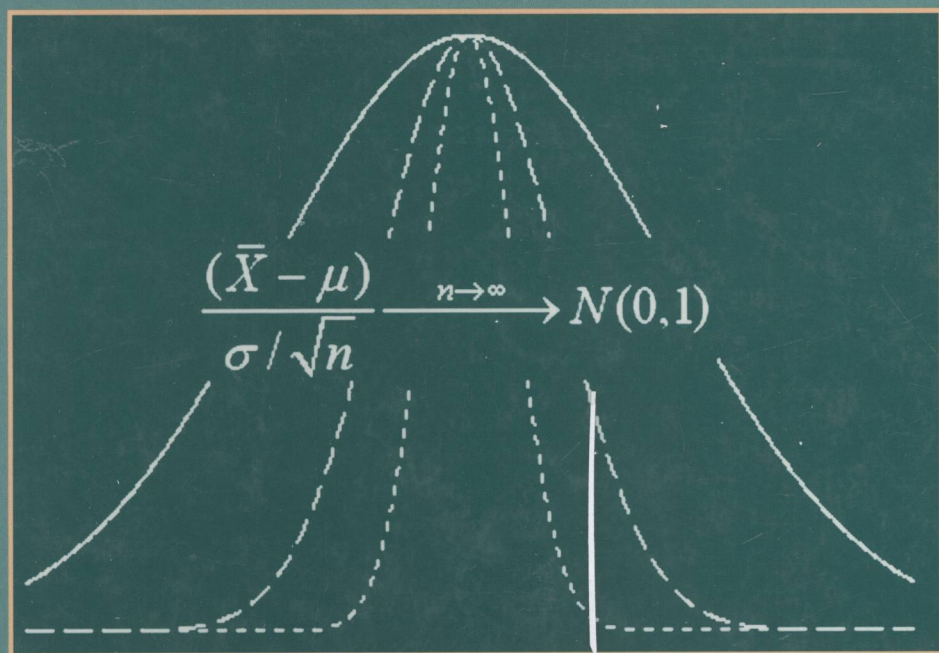


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Mathematical Statistics with Applications



Asha Seth Kapadia
Wenyaw Chan
Lemuel Moyé

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Asha Seth Kapadia

The University of Texas, Health Science Center at Houston

Wenyaw Chan

The University of Texas, Health Science Center at Houston

Lemuel Moyé

The University of Texas, Health Science Center at Houston

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To: *My mother Sushila Seth, my sisters Mira, Gita, Shobha, and
Sweety, my son Dev, and my daughter-in-law Sonia*

A.S.K.

To: *Alice, Stephanie, and Jeffrey*

W.C.

To: *Dixie and the DELTS*

L.A.M.

Preface

Each of us has taught courses in mathematical statistics or advanced probability to students who are interested in becoming applied workers, and each of us has faced the same frustration. Students who require grounding in theoretical statistical structures are commonly unprepared for the theoretical onslaught that awaits them. The course is an exercise in frustration for them as they labor hard to understand mathematical material that they have been told that they must know, yet they do not see the direct relevance between the theoretical discussions and the application of statistics to their applied field.

Our experience has motivated and equipped us to write a textbook that will provide all of the introduction that applied students need to mathematical statistics while keeping useful applications in clear view. We have felt the need for this type of textbook from students, and have finally assembled the resources that we needed to complete this task.

Asha S. Kapadia
Wenyaw Chan
Lemuel A. Moyé

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Introduction

Mathematical statistics is a fundamental course in the graduate training of statistics in both theoretical and applied training programs. This course provides the background and technical sophistication to students as they prepare to take more advanced courses in multivariate analysis, decision theory, stochastic processes, or computational statistics.

Yet this foundation course in mathematical statistics is usually one of the most difficult challenges in the statistical curriculum. One reason for the difficulty is the heavy mathematical prerequisite of standard mathematical statistics curricula. While many graduate students are well prepared in background mathematics, other students with a less focused and more applied background have not had recent experience with the required material. The standard texts in mathematical statistics provide either no review, or at best, a cursory review of the topics on which a heavy reliance is placed in the body of the text. This is insufficient for the student whose exposure to the topics in advanced calculus is remote.

A second difficulty presented by courses in mathematical statistics is the applied student's sudden exposure to material that is wholly theoretical. Mathematical theory devoid of direct application can present unanticipated challenges to the graduate student with a focused interest in applying advanced statistics to a specific area of application, e.g., communications, economics, agronomy, demography or public health.