Math 36b: Mathematical Statistics — Summer 2025

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Course Overview

This class offers an in-depth introduction to the theoretical foundations of statistical methods that are useful in many applications. The goal is to understand the role of mathematics in the research and development of efficient statistical methods.

Course Format

Online Synchronous via Zoom **Schedule**: Monday–Thursday, 11:20 AM–1:40 PM Live attendance and participation are expected.

Course Textbook

An Introduction to Mathematical Statistics and Its Applications, 6th Edition, Pearson by Richard Larsen and Morris Marx (2018)

Prerequisites

- MATH 15a or MATH 22a
- MATH 20a or MATH 22b
- MATH 36a
- OR permission of the instructor (read below)

In addition, if you have taken a statistics course like Math 8a or a similar course before and are comfortable with basic calculus (single-variable differentiation and integration), you may contact me to be assessed for permission to enroll.

Learning Objectives

By the end of this class, you will be able to:

- 1. Formulate a statistical problem in mathematical terms from real-life scenarios
- 2. Understand the role of mathematics in the design and analysis of statistical methods

- 3. Select appropriate statistical methods
- 4. Understand the implications and limitations of various methods
- 5. Develop problem-solving skills and basic statistical programming ability

Course Topics

Topics will be drawn primarily from Chapters 5–12 of the textbook:

- 1. Estimation
- 2. Hypothesis Testing
- 3. Normal Distribution
- 4. Types of Data
- 5. Two-Sample Tests
- 6. Goodness-of-Fit Tests
- 7. Regression
- 8. Analysis of Variance
- 9. Other topics as time permits

Course Requirements and Grading

- Class Participation: 10%
- Homework Assignments: 20%
- Midterm Exams (2 total): 20% each lowest midterm dropped
- Final Exam: 30%

Exams

Exams will be posted on LATTE on the scheduled day and will be due by the **end of that day**. Students will submit their completed exams online.

Homework

Weekly assignments will be posted on LATTE. The lowest homework grade will be dropped. Late homework is accepted only under exceptional circumstances with prior instructor approval.

Academic Integrity

You are expected to adhere to Brandeis University's academic integrity policies. Collaboration on homework is encouraged, but the final submission must reflect your own understanding. Cases of academic dishonesty will be referred to the Director of Academic Integrity. More info: brandeis.edu/studentlife/srcs/rr/

Accommodations

If you are a student with a documented disability and need accommodations, please contact the instructor early in the semester.

Support: Library and Technology Services — Accessibility Resources