

SYLLABUS FOR STS 435 - SPRING 2026 MATHEMATICAL STATISTICS

Description: This is an undergraduate-level course in mathematical statistics. This is intended as the second semester of STS 434 and assumes proficiency of all of its material.

Instructor: Shalin Parekh

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Class Time: MWF Room TBD 1:00 - 1:50 pm

Office Hours: MWF Room 334 Neville Hall 9:55 - 10:45 am

Textbook: Hogg, McKean, & Craig. *Introduction to mathematical statistics*. 8th Edition.

1. TENTATIVE SCHEDULE

Weeks 1-2: Quick review of Chapters 1-3: Random variables and probability distributions.

Weeks 3-5: Chapter 4 - point and interval estimation, order statistics, basics of statistical testing, basics of MCMC, bootstrap

Midterm 1: Monday February 23

Week 6: Chapter 5 - Convergence in distribution, Delta method, central limit theorem.

Spring break: March 16-20

Weeks 7-8: Chapter 6 - Maximum likelihood estimators, Cramer-Rao bound, Efficient estimators, maximum likelihood tests

Midterm 2: Wednesday April 1

Weeks 9-10: Chapter 7 - Unbiased estimators, sufficient statistics, and their properties. Exponential families.

Weeks 11-12: Chapter 8 - Hypothesis tests: most powerful tests, likelihood ratio tests

Weeks 13-14: Chapter 9 - ANOVA: overview of the one-way analysis of variance technique.

Final Exam: TBD

2. GRADING

Homework will be assigned weekly from the book. The class grading will be as follows.

Homework: 30%

Attendance and Participation: 10%

Midterm 1: 20%

Midterm 2: 20%

Final Exam: 20%

3. ACADEMIC HONESTY

The course policy on academic honesty aligns with the University of Maine's code of academic integrity. All students are expected to abide by the code. If a student is suspected to have breached this code, the student will be referred to the Office of Community Standards, Rights, and Responsibilities. For more information on academic integrity, the honor code, and the Office of Community Standards, Rights, and Responsibilities refer to

<https://www.maine.edu/board-of-trustees/policy-manual/section-314/#:~:text=Academic%20integrity%20is%20based%20upon,and%20abilities%20of%20each%20student.>

4. EXTRA HELP

If you are struggling with the course or have any questions, you should make use of my office hours (see above). I am readily available and happy to answer questions. Your classmates are another important resource. Discussing homework and studying together is encouraged, though any written submissions must be your own work.

