

Syllabus

Course: STAT 4158-10, Introduction to Mathematical Statistics II Semester: Spring, 2026
Time: Monday & Wednesday, 2:20 pm - 3:35 pm.
Location: 1957 E, Room 112

Instructor: Tapan Nayak
Office: Rome Hall, Room 762
E-mail: tapan@gwu.edu
Phone: (202) 994-6549
Office hours: M, 1 - 2 pm & W, 3:45 - 4:40 pm. Other times are available by appointment.

Course description:

This course presents mathematical theory of statistical estimation and hypotheses testing. Topics include method of moments and maximum likelihood estimation, criteria for comparing estimators, optimal estimators, sufficiency, Rao-Blackwell Theorem, likelihood ratio test, power function and most powerful test.

Course prerequisite: Stat 4157.

Textbook: *Mathematical Statistics with Applications* (7th edition) by D.D. Wackerly, W. Mendenhall III, and R.L. Scheaffer.

Learning approach and techniques:

- Take an engaged, inquisitive and integrative learning approach.
- Seek to understand and refuse to accept things without understanding. Notice and note clearly all assertions and results that you accept without understanding, if needed.
- Utilize help from other students, the instructor and the TA.
- Assess your knowledge via problem solving and discussions.

Average minimum amount of work expected per week:

Students are expected to spend a minimum of 7.5 hours per week, including 2.5 hours of classroom instruction and a minimum of 5 hours of out-of-class work.

Learning outcomes:

Upon successful completion of this course, students will be able to:

1. Describe and explain key concepts and methods in statistical estimation and hypotheses testing.
2. Use efficient estimators and statistical tests in applications.
3. Write proofs of statistical theorems.
4. Take advanced courses in statistics.

CLASS POLICIES: Students should (i) attend all classes and engage fully in class activities and (ii) review class notes and related material before the next class.

Grading Policy: Homework 25%; Quizzes 15%; Midterm Exam 25%; Final Exam 35%.

- Notes:**
1. Late HW will be accepted only with a valid excuse. Some HW may involve teamwork.
 2. All quizzes will be closed book and unannounced. Quizzes may cover material discussed in the same class. Make-up quizzes will be given only in exceptional cases. The lowest quiz grade will be discarded.
 3. The midterm and final exams are closed book.
 4. The Midterm exam will be given on **Wednesday, March 18, 2026** (tentative).
 5. Make-up midterm will not be given, except for very special circumstances.

6. The final exam will be based on the entire syllabus and will be given as per the University's final exam schedule.

Information on university policies, academic support, support for students in and outside the classroom, and GW campus emergency information can be found at the following link:

bulletin.gwu.edu/university-syllabus-policies/