

Syllabus

Course: STAT 4158-10, Introduction to Mathematical Statistics II Semester: Spring, 2024
Time: Tuesday & Thursday, 2:20 pm - 3:35 pm.
Location: Science & Engineering Hall, Room 7040

Instructor: Tapan Nayak Office: **Rome Hall, Room 762**
E-mail: tapan@gwu.edu Phone: (202) 994-6549
Office hours: TR 3:45 - 4:30 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 the things you accept without understanding, if you must.
- 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 22%; Quizzes 18%; Midterm Exam 25%; Final Exam 35%.

Notes:

1. Late HW will be accepted only with a valid excuse. Most HW will 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 the final exams are closed book.
4. The Midterm exam will be given on **Tuesday, March 5, 2024** (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.

University policies

Academic Integrity Code

Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the [Code of Academic Integrity](#). If you have any questions about whether or not particular academic practices or resources are permitted, you should ask me for clarification. If you are reported for an academic integrity violation, you should contact the Office of Student Rights and Responsibilities (SRR) to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the university and may include a transcript notation. For more information, please refer to the SRR website (<https://studentconduct.gwu.edu/academic-integrity>), email rights@gwu.edu, or call 202-994-6757.

University policy on observance of religious holidays

Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must inform faculty in the first week of the semester. For details and policy, see “Religious Holidays” at provost.gwu.edu/policies-procedures-and-guidelines.

Use of Electronic Course Materials and Class Recordings

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Academic support

Writing Center

GW’s Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online at gwu.mywconline.

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.

Support for students outside the classroom

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services at disabilitysupport.gwu.edu to establish eligibility and to coordinate reasonable accommodations.

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services.

Safety and Security

- In an emergency: call GYPD 202-994-6111 or 911
- For situation-specific actions: review the Emergency Response Handbook at: safety.gwu.edu/emergency-response-handbook
- In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpret
- Stay informed: safety.gwu.edu/stay-informed