

The George Washington University
Department of Statistics
STAT 6201-10
Fall 2024

Note: This syllabus is subject to change based on the needs of the class.

Course and Contact Information

Course: STAT 6201-10, Mathematical Statistics I

Meeting time: Wednesday, 18:10--20:40

Class Meeting Location: Rome Hall 201

Instructor

Name: Huixia Judy Wang

Campus Address: Rome Hall 760A

Phone: 202-994-5658

E-mail: judywang@gwu.edu

Office hours: **Wednesday 3:00pm-4:00pm or by appointment**

Teaching Assistant

Name: Kieran Zhou

Campus Address: Rome Hall 766

E-mail: kieranz@gwu.edu

Office hours: **TBD**

Course Prerequisites

MATH 2233 and MATH 2184.

Students should be familiar with integral and differential calculus, and competent in basic algebra. Exposure to basic probability and statistics can be helpful.

Learning Outcomes

As a result of completing this course, students will be able to:

1. Make probabilistic arguments and study the properties of random variables.
2. Formulate probabilistic models.
3. Recognize and appreciate the interplay between probability and statistics.

Average amount of direct and independent learning expected per week

Students will receive an average of 2.5 hours of direct instruction and are expected to spend a minimum of 5 hours on independent learning per week, for a combined minimum total of 7.5 hours per week.

Required Textbook

Casella, G., & Berger, R.L. (2001). Statistical Inference (2nd Edition). Cengage Learning. (ISBN-13: 978-0534243128). The textbook can be obtained through online retailers or the GW Bookstore.

Week-by-week schedule of topics to be presented and scheduling of final examinations

Week	Topic(s) and readings	Assignment
W1 (08/28)	Introduction to statistics and probability, axioms, combinatorial prob. (Ch 1)	
W2 (09/04)	Bayes' rule, Conditional probability, Independence (Ch 1)	HW 1 due
W3 (09/11)	Random variables (Ch 1), Functions of RVs, Expectation (Ch2)	HW 2 due
W4 (09/18)	Expectation (Ch 2), Exercises	HW 3 due
W5 (09/25)	Moment and moment generating function (Ch 2)	HW 4 due
W6 (10/02)	Midterm Exam 1	
W7 (10/09)	Discrete Distributions (Ch 3)	HW 5 due
W8 (10/16)	Continuous distributions (Ch 3)	HW 6 due
W9 (10/23)	Exponential family, inequalities (Ch 3), Bivariate random variables (Ch 4)	HW 7 due
W10 (10/30)	Marginal, conditional distribution; Conditional mean/variance, covariance, correlation (Ch 4)	HW 8 due
W11 (11/6)	Multivariate distribution & transformation; probability inequalities (Ch 4)	HW 9 due
W12 (11/13)	Midterm 2	
W13 (11/20)	Random sample, sum of independent random variables (Ch 5)	HW 10 due
11/27	No Class. Happy Thanksgiving	
W14 (12/4)	Sampling distribution, convergence (Ch 5). Last Class	HW 11 due
W15	Final week, 12/10 (Tuesday): Reading Day Final Exam (during 12/11-12/17), Date TBD	
NOTE: In accordance with university policy, the final exam will be given during the final exam period and not the last week of the semester. For details and complete policy, see: provost.gwu.edu/administration-final-examinations-during-examination-period		

Scheduling of Final Examinations

Final examinations, which include any type of end-of-semester examination, are to be administered as week 15 of a 15-week semester and only during the regularly scheduled examination period. To provide students maximum opportunity to study and review material covered during the semester, and to ensure 15 weeks of instruction, final examinations may not be administered during regularly scheduled class sessions, on class make-up days, or during the reading period.

Assignments

There will be weekly homework assignments due in class. The tentative due dates are specified in the schedule table above.

Grading

- Homework assignment (weekly): **20%**, due in class. Work independently. Copying will disqualify you and will lead to disciplinary actions. **No late homework will be accepted.**
- Midterm exam 1 (in class): **20%**, closed book and notes.
- Midterm exam 2 (in class): **20%**, closed book and notes.
- Final exam: **40%**, closed book and notes, cumulative.
- For the midterm and final exams, the instructor will provide a formula sheet. Students may bring a one-page, one-sided 8x11 formula sheet for the midterm exams and a two-page, one-sided 8x11 formula sheet for the final exam.

Class Policies

- **Attendance:** Attendance is expected. Please inform me as early as possible if you need miss a class so that appropriate arrangements can be made.
- **Late work:** Not accepted unless appropriate justification is provided.
- **Make-up exam:** No make-up exam except under extraordinary circumstances, in which a written request and legitimate documentation must be submitted **in advance**. Under no circumstances will make-ups be given to accommodate travel arrangements that conflict with scheduled course activities.

Learning Tips

- Try to show up in all the lectures. Make good notes.
- Ask questions in class. Your questions may be others' as well. No questions are too elementary, and all deserve to be answered.
- Discuss with your classmates about your questions. It is ok to work together on homework assignments but each has to deliver independent work.
- Keep up with the course and finish homework in time.
- Visit the instructor's and TA's office hours.

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 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 Conflict Education and Student Accountability (CESA), formerly known as 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, refer to the CESA website at students.gwu.edu/code-academic-integrity or contact CESA by email cesa@gwu.edu or phone 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 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. Contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Academic Support

Academic Commons

[Academic Commons](http://academiccommons.gwu.edu) is the central location for academic support resources for GW students. To schedule a peer tutoring session for a variety of courses visit go.gwu.edu/tutoring. Visit academiccommons.gwu.edu for study skills tips, finding help with research, and connecting with other campus resources. For questions email academiccommons@gwu.edu.

GW Writing Center

GW 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.

Support for students in and 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.

Student Health Center 202-994-5300, 24/7

The Student Health Center (SHC) offers [medical](#), [counseling/psychological](#), and [psychiatric](#) services to GW students. More information about the SHC is available at healthcenter.gwu.edu. Students experiencing a medical or mental health emergency on campus should contact GW Emergency Services at 202-994-6111, or off campus at 911.

GW Campus Emergency Information

GW Emergency Services: 202-994-6111

For situation-specific instructions, refer to [GW's Emergency Procedures guide](#).

GW Alert

GW Alert is an emergency notification system that sends alerts to the GW community. GW requests students, faculty, and staff maintain current contact information by logging on to alert.gwu.edu. Alerts are sent via email, text, social media, and other means, including the Guardian app. The Guardian app is a safety app that allows you to communicate quickly with GW Emergency Services, 911, and other resources. Learn more at safety.gwu.edu.

Protective Actions

GW prescribes four protective actions that can be issued by university officials depending on the type of emergency. All GW community members are expected to follow directions according to the specified protective action. The protective actions are Shelter, Evacuate, Secure, and Lockdown (details below). Learn more at safety.gwu.edu/gw-standard-emergency-statuses.

Shelter

- Protection from a specific hazard
- The hazard could be a tornado, earthquake, hazardous material spill, or other environmental emergency.
- Specific safety guidance will be shared on a case-by-case basis.

Action:

- Follow safety guidance for the hazard.

Evacuate

- Need to move people from one location to another.
- Students and staff should be prepared to follow specific instructions given by first responders and University officials.

Action:

- Evacuate to a designated location.
- Leave belongings behind.
- Follow additional instructions from first responders.

Secure

- Threat or hazard outside of buildings or around campus.
- Increased security, secured building perimeter, increased situational awareness, and restricted access to entry doors.

Action:

- Go inside and stay inside.
- Activities inside may continue.

Lockdown

- Threat or hazard with the potential to impact individuals inside buildings.
- Room-based protocol that requires locking interior doors, turning off lights, and staying out of sight of corridor window.

Action:

- Locks, lights, out of sight
 - Consider Run, Hide, Fight
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- **Classroom emergency lockdown buttons**
Some classrooms have been equipped with classroom emergency lockdown buttons. If the button is pushed, GWorld Card access to the room will be disabled, and GW Dispatch will be alerted. The door must be manually closed if it is not closed when the button is pushed. Anyone in the classroom will be able to exit, but no one will be able to get in.