

The George Washington University
Department of Statistics
STAT 6201-10
Fall 2023

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: Monday, 18:10--20:40

Location: Phillips Hall 110

Instructor

Name: Huixia Judy Wang

Campus Address: Rome Hall 760A

Phone: 202-994-5658

E-mail: judywang@gwu.edu

Office hours: Monday 3:00pm-4:00pm or by appointment

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.

Course description

STAT 6201 focuses on probability theory and sets the mathematical foundation for statistical inference. The course describes probabilistic models for and properties of discrete and continuous random variables, common probability distributions, and discuss joint distributions and transformation, and introduces probabilistic convergence concepts.

Course prerequisites

Students taking the course 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 for different applications.
3. Recognize and appreciate the interplay between probability and statistics.

Credit hour policy

The average minimum amount of out-of-class or independent learning expected per week is 5 hours.

Topics and a tentative schedule

Week	Topic(s) and readings	Assignment
W1 (08/28)	Introduction to statistics and probability, axioms (Ch 1)	
9/04	Labor day (no class)	
W2 (09/11)	Combinatorial probability, Bayes' rule (Ch 1)	HW 1 due
W3 (09/18)	Conditional probability, independence, random variables (Ch 1)	HW 2 due
W4 (09/25)	Functions of random variables, expectation (Ch 2)	HW 3 due
W5 (10/02)	Expectation, moment and moment generating function (Ch 2)	HW 4 due
W6 (10/09)	Discrete distributions (Ch 3)	HW 5 due
W7 (10/16)	Discrete and continuous distributions (Ch 3)	HW 6 due
W8 (10/23)	Continuous distributions (Ch 3), Midterm Exam	
W9 (10/30)	Exponential family, inequalities (Ch 3), Bivariate random variables (Ch 4)	HW 7 due
W10 (11/6)	Bivariate, marginal, conditional distribution; Conditional mean/variance, covariance, correlation (Ch 4)	HW 8 due
W11 (11/13)	Multivariate distribution, multivariate transformation (Ch 4)	HW 9 due
11/20	Happy Thanksgiving (no class)	
W12 (11/27)	Probability inequalities (Ch 4); random sample (Ch 5)	HW 10 due
W13 (12/4)	Random sample, sum of independent random variables (Ch 5)	HW 11 due
W14 (12/11)	Sampling distribution, convergence (Ch 5); order statistics (Ch 6, time permitting). Last Class	HW 12 due
TBA	Final Exam	
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		

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.**
- Quiz (in class, pop): **10%**, based on most recent lecture and submitted homework.
- Midterm exam (in class): **30%**, closed book and notes.
- Final exam: **40%**, closed book and notes, cumulative.
- For midterm and final exams, the instructor will provide a formula sheet.

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:** Generally 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 office hours.

University Policies

University policy on observance of religious holidays

In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, see: students.gwu.edu/accommodations-religious-holidays.

Academic integrity code

Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information. For details and complete code, see: studentconduct.gwu.edu/code-academic-integrity

Safety and security

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.

Support for students outside the classroom

Disability Support Services (DSS)

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information see: disabilitysupport.gwu.edu/

Mental Health Services 202-994-5300

The University's Mental Health Services offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. For additional information see: counselingcenter.gwu.edu/