The George Washington University
Department of Statistics

STAT 4157-11 Fall 2021
Introduction to Mathematical Statistics I

Meeting Time: Mondays & Wednesdays 3:45 p.m.-- 5 p.m.

Instructor: Dr. Lin Wang

Email: linwang@gwu.edu

Office address: Rome Hall 769

Office hours: Mondays 11am-noon & Wednesdays 5:10pm-6pm

Recording:

Classes will be recorded. Recordings will be shared on Blackboard. Please be aware that this is not a distance learning course, and the recording quality depends on the devices in the classroom and may not be perfect.

Joining Remote Office Hours

Please join my personal meeting room on Zoom:

https://gwu-edu.zoom.us/my/linwang

Textbook

D. Wackerly, W. Mendenhall, and R. Scheaffer (2008). *Mathematical Statistics with Applications*, 7th Edition. Brooks/Cole, Belmont, California.

Prerequisites

Calculus is required. Familiarity with integral and differential calculus is assumed. For example, I expect everyone in the class to know $\int x^6 \, dx$, $\int e^{-x} \, dx$, $\int \ln x \, dx$. Competence in basic algebra is expected, for example, extraction of roots of

equations of the second and third degree, and accurate manipulation of algebraic expressions are assumed to be in your background.

An introductory course in Statistics and/or probability can be helpful but is not required.

Topics

Combinatory and calculus-based introduction to statistics and probability, axioms, combinatorial probability, Bayes' rule, random variables, discrete distributions (Bernoulli, binomial, geometric, Poisson) and continuous distributions (uniform, exponential, gamma, normal, beta), expectation and variance, moment generating functions, probability inequalities, probabilistic models for multivariate random variables, transforming and combining random variables, sampling from a normal population, the central limit theorem.

Basically, we shall cover most of the materials in chapters 1 through 6 of the textbook.

Learning Outcomes

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

1. Make probabilistic arguments.
2. Formulate probabilistic models for science, engineering, economics, public policy and many other areas of application.
3. Have a global overview of the interplay between probability and statistics.

Grading Policy

1 Midterm exam (20%), on Wednesday, Oct 20th

1 Final (40%), during the final period, to be announced later

4 Quizzes (20%), evenly scheduled through the semester

8-10 Homework assignments (20%. The lowest score will be dropped.)

All exams are open book. Discussion of exam problems during the exam time with fellow students is not allowed. Exams should be completely independent work.

Class Policy
Homework assignments need to be submitted to the portals on Blackboard. Any homework submission sent to the instructor or the TA by email will not be accepted.

Late homework submitted within 2 days (48 hours) of due date will receive 25% penalty for each day (24 hours) late. Any HW late by more than 2 days will not be graded and will receive zero point.

In writing up homework, it is not sufficient to give only the answer to a problem; you must show reasonably detailed justifications/calculations.

Make-up exams: Except for medical cases (with proper documentation), there will be no make-ups.

Workload
Other than the 2.5 hours of lectures, it is expected that the student would spend about 5-6 hours a week studying and preparing for the class. This time may be evenly split between writing solutions to homework problems and reading in the textbook.

Blackboard
Please check Blackboard frequently, as there may be assignments, announcements, and material passed to the class via this electronic medium during the week. You can find it at
http://blackboard.gwu.edu/webapps/portal/frameset.jsp
You need to login, using your GW user ID and password.

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 "Religious Holidays" at provost.gwu.edu/policies-procedures-and-guidelines

Academic Integrity Code

Academic Integrity is an integral part of the educational process, and GW takes these matters very seriously. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and in other ways outlined in the Code of Academic Integrity. Students accused of academic integrity violations should contact the Office of Academic Integrity to learn more about their rights and options in the process. Outcomes can range from failure of assignment to expulsion from the University, including a transcript notation. The Office of Academic Integrity maintains a permanent record of the violation.

More information is available from the Office of Academic Integrity at studentconduct.gwu.edu/academic-integrity. The University's "Guide of Academic Integrity in Online Learning Environments" is available at studentconduct.gwu.edu/guide-academic-integrity-online-learning-environments. Contact information: rights@gwu.edu or 202-994-6757.

Support for Students outside The Classroom

Virtual academic support

A full range of academic support is offered virtually in fall 2020. See coronavirus.gwu.edu/top-faqs for updates.

Tutoring and course review sessions are offered through Academic Commons in

an online format. See academiccommons.gwu.edu/tutoring

Writing and research consultations are available online. See academiccommons.gwu.edu/writing-research-help

Coaching, offered through the Office of Student Success, is available in a virtual format. See studentsuccess.gwu.edu/academic-program-support

Academic Commons offers several short videos addressing different virtual learning strategies for the unique circumstances of the fall 2020 semester. See academiccommons.gwu.edu/study-skills. They also offer a variety of live virtual workshops to equip students with the tools they need to succeed in a virtual environment. See tinyurl.com/gw-virtual-learning

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. See **gwu.mywconline.**

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**.

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 to establish eligibility and to coordinate reasonable accommodations.

disabilitysupport.gwu.edu

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 GWPD 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