COURSE AND CONTACT INFORMATION

- Course: STAT-1127-11 Statistics for the Biological Sciences
- Semester: Fall, 2026
- Time: Tuesday/Thursday, 2:20PM - 3:35PM
- Location: Phillips Hall, #B156

INSTRUCTOR

- Name: Yinglei Lai, Ph.D.
- Campus Address: Rome Hall (801 22nd Street) / Room 752
- Phone: 202-994-6664
- E-mail: ylai@gwu.edu (preferred)

- Office hours: Tuesday/Thursday, 12:00PM - 1:00PM, or by appointment

COURSE DESCRIPTION

Introduction to statistical techniques and reasoning applicable to the biomedical and related sciences. Properties of basic probability functions: binomial, Poisson, and normal. Data analysis, inference, and experimental design.

Note: Credit cannot be earned for this course and STAT 1051, STAT 1053, STAT 1111. (STAT 1051 Introduction to Business and Economic Statistics, STAT 1053 Introduction to Statistics in Social Science, STAT 1111 Business and Economic Statistics I, and STAT 1127 Statistics for the Biological Sciences are related in their subject matter, and credit for only one of these courses may be applied toward a degree.)

https://bulletin.gwu.edu/arts-sciences/statistics/#coursestext

COURSE PREREQUISITES

- One entrance unit in algebra is prerequisite to all courses in statistics

https://bulletin.gwu.edu/arts-sciences/statistics/#coursestext

LEARNING OUTCOMES

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

- Understand and utilize statistical tools to describe simple datasets
- Apply laws of probability
- Construct and interpret large-sample and small-sample confidence intervals
- Evaluate evidence for and against hypotheses using statistical tests
- Perform analysis of variance

(at a fundamental level. More course work studies and/or practical experience of advanced statistical inference are needed for more sophisticated tasks.)

TEXTS

- Biostatistics: A Foundation for Analysis in the Health Sciences (11th Edition)
  by Wayne W. Daniel and Chad L. Cross

https://www.wiley.com/en-us/Biostatistics%3A+A+Foundation+for+Analysis+in+the+Health+Sciences%2C+11th+Edition-p-9781119496571

Student's Solutions Manual can be downloaded at

https://bcs.wiley.com/he-bcs/Books?action=resource&bcsId=11491&itemId=1119496578&resourceId=45608

Average amount of direct instruction and average minimum amount of independent (out-of-class) learning expected per week: For each credit, students are expected to spend a minimum of 100 minutes in independent learning for every 50 minutes of direct instruction for a minimum total of 2.5 hours per week or

37.5 hours for the semester. A 3-credit course, for example, would include 2.5 hours of direct instruction and a minimum of 5 hours of independent learning per week for a combined minimum total of 7.5 hours per week or 112.5 hours per semester. See Assignment of Credit Hour Policy (http://provost.gwu.edu/policies-procedures-and-guidelines) for more information.

WEEK-BY-WEEK (TENTATIVE) SCHEDULE OF TOPICS TO BE PRESENTED

- Some Basic Probability Concepts
- Bayes' Theorem, Screening Tests, Sensitivity, Specificity, and Predictive Value Positive and Negative
- Probability Distributions of Discrete Variables
- Continuous Probability Distributions
- Sampling Distributions
- Distributions of Sample Means and Sample Proportions
- Estimation
- Confidence Intervals for Population Means and Population Proportions
- Hypothesis Testing
- Hypothesis Testing on Population Means, Population Proportions and Population Variances
- Power and Sample Size
- Analysis of Variance
- Completely Randomized, Randomized Complete Block and Repeated Measures Designs
- Factorial Experiment

NOTE: For the final exam, please see Administration of Final Examinations during the Examination Period (http://provost.gwu.edu/administration-final-examinations-during-examination-period).

ASSIGNMENTS

Homework assignments will be given according to the course progress (for quiz/exam preparation).

GRADING

- Quizzes: 30%, closed book (3-5 minutes before each lecture), one half of lowest grades will be discarded.
- Midterm examination/presentation/project (to be announced): 35%.
- Final examination/presentation/project (to be announced): 35%.

The Blackboard System (http://blackboard.gwu.edu/) will be used for this course.

CLASS POLICIES

- Regular class attendance
- No make-up quiz
- No early or make-up examination/presentation/project
    - Except under highly extraordinary circumstances (request must be submitted as early as possible)

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 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 writingcenter.gwu.edu/.

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
  - 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.