

The George Washington University – Department of Statistics

COURSE AND CONTACT INFORMATION

Course: STA 1053 –Introduction to Statistics in Social Sciences

Semester: Fall 2023

Time: MW 6:10-7:25pm

Location: 1957 E 214

INSTRUCTOR

Name: Joshua Sparks

Campus Address: Phillips 735

E-mail: josparks@gwu.edu (Put STA 1053 in Subject)

Office hours: W 5PM-6PM, *and by appointment*

TEACHING ASSISTANTS

Name: Muzhe Guo (Section 37)

Campus Address: TBA

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Name: Ziji Qin (Section 38)

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Office Hours: TBA

COURSE DESCRIPTION

Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, regression and correlation, with applications to social sciences.

COURSE PREREQUISITE(S)

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

COURSE COREQUISITE

All students to sign up for STA 1053 must also sign up for one of the corresponding Discussion Sections:

Section 37 (CRN:43563) – T 3:45-4:35pm, Tompkins Hall 205

Section 38 (CRN:42271) – T 5:10-6:00pm, Bell Hall 106

NOTICE

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.

LEARNING OUTCOMES:

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

- (1) Calculate descriptive statistics like measures of central tendency, variability, correlation coefficient. Apply laws of probability, work with random variables, in particular the binomial and normal. Find the least-squares equation for simple linear regression and apply.
- (2) Have basic idea about sampling distribution and Central limit theorem.
- (3) Make Statistical Inference, in particular they will be able to construct large-sample and small-sample confidence intervals; perform large-sample and small-sample tests of hypotheses.
- (4) Analyze data using statistical software.

Learning Focus: Disciplined logical thinking and understanding relevant concepts and arguments.

Learning Approach: One will be engaged in active learning where one will develop one's ability to think, write, and speak about statistics as a cohesive narrative. Arguments should be coherent and make good sense, all while taking ownership of the material and understanding at both the sophisticated as well as colloquial levels.

TEXTS & RESOURCES

- (1) **Text:** *Statistics*, 13th Edition, by McClabe and Sincich, 2018. (ISBN: 9780135935514)
Note: You will receive a digital copy of the text with the MyStatLab Client and do not need to purchase another copy.
- (2) **MyStatLab**
- (3) **Calculator:** A scientific calculator with two-variable statistical functions. The instructor will use a TI-83 or TI-84.
- (4) **RStudio:** You will have guided projects using the R programming language and will need to download the software. There will also be a tutorial provided on Blackboard.

Average minimum amount of out-of-class / independent learning expected per week:

In a 15-week semester, including exam week, students are expected to spend a minimum of 100 minutes of out-of-class work for every 50 minutes of direct instruction, for a minimum total of 2.5 hours a week. A 3-credit course should include 2.5 hours of direct instruction and a minimum of 5 hours of independent learning or 7.5 hours per week.

More information about GW's credit hour policy can be found at:

provost.gwu.edu/policies-forms (webpage); or

https://provost.gwu.edu/sites/g/files/zaxdzs626/f/downloads/Resources/Assignment-Credit-Hours_Revised-11-17.pdf (form)

TENTATIVE COURSE OUTLINE

- Chapter 1: Statistics, Data, and Statistical Thinking – 1.5 days
Chapter 2: Methods for Describing Sets of Data – 2 days
Chapter 3: Probability – 2.5 days
Chapter 4: Discrete Random Variables – 2 days
Chapter 5: Continuous Random Variables – 2 days
Chapter 6: Sampling Distributions – 1.5 day
Chapter 7: Estimation with Confidence Intervals on a Single Sample – 2 days
Chapter 8: Tests of Hypotheses on Single Sample – 2.5 days
Chapter 9: Inference Based on Two Samples – 3 days
Chapter 10: Design of Experiments and Analysis of Variance – ½ day
Chapter 11: Simple Linear Regression – 2 days
Chapter 13: Categorical Data Analysis – 1 day

TENTATIVE EXAM SCHEDULE

Exam 1	<i>September 20th</i>
Exam 2	<i>October 18th</i>
Exam 3	<i>November 8th</i>
Final Comprehensive Exam	<i>During Final Exam Period</i>

GRADING

Homework (MyStatLab)	10%	Test 1	15%
Quizzes	10%	Test 2	15%
Computer Projects	10%	Test 3	15%
		Final Comprehensive Exam	25%

Grading Scale: The grading scale for the course is

%	< 60	60-69	70-79	80-89	90-100
Grade	F	D-range	C-range	B-range	A-range

With “+” scores from _7% through _9% and “-” scores from _0% through _3%.

CLASS POLICIES

- Students are expected to
 1. Attend lectures and engage in class discussion when applicable.
 2. Review class notes after every class.
- An official GWU e-mail address is established for each registered student, each faculty member, and each staff member. All university communications sent via e-mail will be sent to this GWU e-mail address.

University Policy on Religious Holidays:

1. 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;
2. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations;
3. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities

- Homework:
All students are required to use **MyStatLab** for homework. Achieving a 90.0% or higher on a given assignment will result in full credit for the assignment (e.g. 74% → 74%, 94% → 100%).

In order to use MyStatLab go to information on Blackboard and follow the instructions provided.

Course Name: Intro-Stat in Social Science, Fall 2023

Course ID: sparks22217

- Exams:
Three midterm exams and a final exam will be provided, covering topics in the course.
 - Make-up exams will only be given for valid excuses and will tend to be more difficult than the original exam. If you miss an exam, contact the instructor as soon as possible via e-mail.
 - The final exam will be cumulative.
- Projects:
Three projects will be assigned during this course.
 - These projects will often be using the statistical programming package R (and RStudio). Students will be guided through each of the projects.
[Students are not expected to have prior experience with R in order to complete the assignments.]
- Recordings: At this time, it is **not expected that class recordings will be made public to the course**. Instead, all notes will be provided via Blackboard, and completed versions will be posted at the end of each chapter. However, there will be optional material recorded on Blackboard for the interested learner.

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 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

Week	Date	Day	Lecture Material Covered	Recitation Material Covered (Tuesday)	Project Due (Friday)
1	8/28	M	Chapter 1.1-1.3	No Class	
	8/30	W	Chapter 1.4-1.6		
2	9/4	M	No Class (Labor Day)	Introduction to R	
	9/6	W	Chapter 2.1-2.4		
3	9/11	M	Chapter 2.5-2.9	Quiz 1 (Chapter 1, Sections 2.1-2.4)	
	9/13	W	Chapter 10, Review		
4	9/18	M	Chapter 3.1-3.4	Review for Test 1	
	9/20	W	Test 1 (Chapter 1, 2, 10)		
5	9/25	M	Chapter 3.5-3.6	Probability Practice	Project 1 Due 9/29
	9/27	W	Chapter 3.7-3.8		
6	10/2	M	Chapter 4.1-4.3	Quiz 2 (Chapter 3)	
	10/4	W	Chapter 4.4-4.6		
7	10/9	M	Chapter 5.1-5.2, 5.6	Probability Practice	
	10/11	W	Chapter 5.3-5.5		
8	10/16	M	Chapter 6.1-6.2, Review	Review for Test 2	
	10/18	W	Test 2 (Chapters 3-5)		
9	10/23	M	Chapter 6.3; 7.1-7.2	Review Inference on Means	Project 2 Due 10/28
	10/25	W	Chapter 7.2-7.5		
10	10/30	M	Chapter 8.1-8.3	Quiz 3 (Chapter 6-7)	
	11/1	W	Chapter 8.4-8.5, 8.7		
11	11/6	M	Chapter 6.4; 7.4; Review	Review for Test 3	
	11/8	W	Test 3 (Chapters 6-8)		
12	11/13	M	Chapter 7.5, 8.6	Sampling Simulation for Proportion	
	11/15	W	Chapter 9.1-9.3		
13	11/20	M	No Class (Thanksgiving)	No Class (Thanksgiving)	
	11/22	W	No Class (Thanksgiving)		
14	11/27	M	Chapter 9.4-9.5; 2.8; 11.1	Quiz 4 (Chapter 9)	Project 3 Due 12/1
	11/29	W	Chapter 11.2-11.3, 11.5		
15	12/4	M	Chapter 13.1-13.4	Review Regression	
	12/6	W	Review		
16	12/11	M	Review	No Class	
	12/13	W	Finals Session Starts		