

Math 114xg: Foundations of Statistics

Spring 2025 Syllabus^{*}

Course ID and Title: 39989 Math 114xg: Foundations of Statistics

Textbook: Introduction to Statistical Investigations, 2nd Edition [Single Term Access to WileyPLUS](#)

Units: $4 \approx$ (4 hours of class work/week) + (8 hours of homework/week)

Lectures: MWF 1:00-1:50pm in VPD 116

Discussions: TTh

- > 12:00-12:50pm in KAP 113 for §39990
- > 1:00-1:50pm in KAP 141 for §39991

Instructor: Anne Dranowski

- > Office: TBA
- > Office Hours (tentative): Monday 9-9:45am, Wednesday 3:15-4pm, or by apt
- > Contact Info: dranowsk@usc.edu — no reply within 24 hours? follow-up

Teaching Assistant: Aykut Arslan

- > Office: Math Center (KAP 263)
- > Office Hours: TBA at dornsife.usc.edu/mathcenter
- > Contact Info: aarslan@usc.edu — no reply within 24 hours? follow-up

Course Description This course is an introduction to statistics. Statistics is the art and science of analyzing and making generalizations from data. We shall see that it is grounded in probability which is a branch of mathematics and very much scientifically based, but designing experiments and interpreting results is very much an art. We will be wrestling with both the science and art of statistics in this class.

The text is *activity-based*. We will do activities together and in small groups. Through summaries you will reflect on and consolidate *active-learning*. Expect to learn in a zigzag way: ideas will be introduced before definitions, and revisited multiple times. Clarity will grow with exposure.

The Office of Student Accessibility Services OSAS facilitates accommodations. The Letter of Accommodation which is generated upon completion of the OSAS process must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu.

^{*}Disclaimer: The instructor reserves the right to make changes. Latest edit: January 12, 2025.

Learning Objectives Work hard and be kind. Below is a tentative list of objectives.

- > Identify different types of data and variables (categorical, numerical, paired,...)
- > Represent data in appropriate ways depending on the type of data, the statistical features to be highlighted, the patterns to be discerned
- > Use simulation effectively both as an exploratory tool and for making statistical inferences
- > Identify valid and invalid statistical inferences depending on the way the data were collected
- > Make statistical inferences using theory and simulation based on observations of a single categorical variable (Ch 1—3)
- > Make statistical inferences using theory and simulation based on observations of a single quantitative variable (Ch 2—3)
- > Compare two population proportions and treatment probabilities; make statistical inferences using simulation and theory (Ch 4—5)
- > Compare two population means and treatment means; make statistical inferences using simulation and theory (Ch 4,6,7)
- > Explore relationships between several population (Ch 8—10)

Description of Assessments Always, credit will given for clearly introducing notation, formulating reasonable assumptions, and applying relevant tools.

There will be **weekly homework assignments** (15%) which will be due Fridays starting the first week of class and submitted in Gradescope. Please direct any logistical questions (e.g. about late homework) to TA Arslan Aykut.

There will be **two midterm exams** (25% each) and a **final exam** (35%). Midterms will be held during class. Bring your student ID to all exams. Tentative dates:

- > Midterm 1: Friday, February 14th during class
- > Midterm 2: Friday, April 4th during class
- > Final: Wednesday, May 7th 2-4pm

Your health is more important than anything. If you experience a health-related emergency the day of a midterm, contact me ASAP. If we can reschedule your midterm on the same day (possibly over zoom), we'll do that. Otherwise, we will put the weight of the missed midterm towards your final exam.

Extra Credit Two types of extra credit opportunities will be available. Extra credit will reduce the weight of the exams.

1. Participation: Group activities will be conducted during TTh discussions and occasionally during MWF lectures. Your participation in these activities will contribute up to 5% credit and correspondingly reduce the weight put on all exams as follows. Participation up to the first midterm can reduce the weight put on that midterm by 2%, participation between the first and second midterm can reduce the weight put on the second midterm by 2%, and participation after the second midterm can reduce the weight put on the final by up to 1%. For example if your participation score before the first midterm is 7/10, then you will get 1.4 points (which is 70% of 2 points) and your first midterm will be worth 23.6% instead of 25%.

2. WileyPLUS: Online homework will be assigned in Brightspace for each section of the text. Your completion of these can contribute up to 10% credit and correspondingly reduce the weight put on all exams as follows. Homework assigned up to the first midterm can reduce the weight put on that midterm by 3%, homework assigned between the first and second midterm can reduce the weight put on the second midterm by 3%, and homework assigned after the second midterm can reduce the weight put on the final exam by 4%.

Grading Scale Grades will be determined by combining raw scores for written homework, midterm exams, WileyPlus online homework, and group activities according to their weights out of a 100. These percent scores will then be converted to letter grades according to the class distribution (aka, I will curve the grades). Based on previous experience, this might look something like:

% Range	Letter
87–100	As
75–87	Bs
60–76	Cs
45–60	Ds
0–45	Fs

Academic Conduct I encourage you to work together on homework and you are expected to work together on group activities. However, simply copying someone else's work and, in particular, representing it as your own work, constitutes academic dishonesty. Familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. See also policy.usc.edu/scientific-misconduct.

Support Systems USC Campus Support and Intervention assists students and families in resolving complex personal, financial and academic issues adversely affecting their success as a student. Visit them at campussupport.usc.edu. USC Counseling and Mental Health offers free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. Visit them at studenthealth.usc.edu/counseling.