STA 103: Applied Statistics for Business & Economics
Summer Session II 2025

Instructor Information

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Office Hours: R 2:00 - 3:00 pm at MSB 1143

Class Information

Dates: Aug 4 – Sep 12
Time: MTW 12:10 – 1:50 pm
Classroom: Olson Hall 223

Discussion Information

Time: R 12:10 - 1:50 pm
Classroom: Olson Hall 223

Participation in discussions is highly encouraged, as they focus on solving practical problems similar to those found in assignments and exams, but it is not mandatory.

Course Description

This course offers an intuitive refresher of STA 13 (or equivalent), focusing on conceptual understanding over formal notation. Emphasis is placed on the "why" behind statistical methods, geometric intuition through visual tools, and practical interpretation of results, especially in finance and business contexts.

Keywords: Descriptive statistics; probability; random variables; expectation; univariate distributions; joint distributions; sampling distributions, central limit theorem; properties of estimators; linear combinations of random variables; testing and estimation.

Prerequisites

Students who have already completed STA 100 will only receive 2 units of credit for STA 103.

- STA 13, 13Y, 32, 35B, or 100 with a grade of C- or better, i.e. at least 1 intro Statistics course.
- MAT 16B, 17B, 19B, or 21B with a grade of C- or better, i.e. at least 1 year of Calculus.

Course Objectives

The goal of the course is the introduction of statistical techniques typically encountered in finance and business data. At the end of the course you will be able to:

- Examine and summarize data.

- Understand and interpret statistical techniques commonly used in real-world applications, i.e., apply probability concepts to assess risk and uncertainty in decision-making.
- Define and analyze random variables relevant to business and economic applications, distinguishing between discrete and continuous models.
- Apply the Central Limit Theorem to make inferences from sampled real data.
- Construct and interpret confidence intervals to estimate population parameters in market research and economic studies.
- Conduct hypothesis tests to support business strategies and economic policy decisions.
- Critically evaluate statistical analyses and data-driven claims in the fields of business and economics, enhancing data literacy for informed decision-making.

Course Schedule

Date	Topic / Description
Aug 4 (M)	Introduction, Statistical Concepts and Notations
Aug 5 (T)	Probability, Distribution, Random Variables
Aug 6 (W)	Discrete Random Variables
Aug 7 (R)	*Discussion 1: Review of Week 1*
Aug 11 (M)	Joint Distributions, Conditional Distributions
Aug 12 (T)	Continuous Random Variables, *HW1 due by noon*
Aug 13 (W)	Midterm 1 (12:10 - 1:00 pm)
Aug 14 (R)	*Discussion 2: Review of Week 2*
Aug 18 (M)	Standardization, Percentiles
Aug 19 (T)	Central Limit Theorem
Aug 20 (W)	Correlation, Prediction with Bivariate Gaussion
Aug 21 (R)	*Discussion 3: Review of Week 3*
Aug 25 (M)	Estimation, *HW2 due by noon*
Aug 26 (T)	Midterm 2 (12:10 - 1:00 pm)
Aug 27 (W)	Confidence Interval
Aug 28 (R)	*Discussion 4: Review of Week 4*
Sep 1 (M)	Labor Day (No class)
Sep 2 (T)	Hypothesis Testing
Sep 3 (W)	Linear Regression
Sep 4 (R)	*Discussion 5: Review of Week 5*
Sep 8 (M)	Final Review, *HW3 due by noon*
Sep 9 (T)	Final Exam (12:10 - 1:50 pm)

Textbook & Calculator

Textbook: *Statistics for Economics: An Intuitive Approach*, by Alan Scott Caniglia. Note that most of course materials will be delivered in the Lecture, Discussion Sections, and on Canvas. The textbook is recommended but not required. Some students have found this useful, others have not, especially since the order of topics may differ.

Calculator: You will need a calculator to do the computations that will arise throughout the course. No specific calculator is required.

Grading

The course grade is determined by the following components:

Homework	20% (Lowest grade will be dropped, 10% each)
Piazza Participation	5%
Exams	75% (See notes below)

Your **Exams** grade (75%) will be the highest of the following options:

- Midterm 1 (30%) + Midterm 2 (5%) + Final (40%),
- Midterm 1 (5%) + Midterm 2 (30%) + Final (40%),
- Midterm 1 (20%) + Midterm 2 (20%) + Final (35%).

This flexible grading policy is designed to minimize the impact of an low score on one of the midterm exams.

Regrade Policy: You have **3** days from the time a graded assignment is posted (exams, homework) to request a regrade. Please email **Yemisi Obasemo** (ysobasemo@ucdavis.edu), PhD student, the Reader for this course, and make sure to **cc me** on your message. Regrade requests submitted after the **3** day window may not be considered.

Grade Scale

Final grades will generally follow the scale below:

A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	< 60

Your letter grade for the course will be based on your overall score. The usual conventions can apply regarding the use of + and –. Individual exams will **not** be curved. However, your final course grade and the letter grade cutoffs will not be finally set until after the Final Exam and after all assignment grades are recorded in the Canvas Gradebook, choosing your highest Exams grade out of three options, by looking at the distribution of **total** grades for the entire class. Cutoffs for letter grades **may** be lowered, but cutoffs will never be raised.

However, note that course grade percentages will not be rounded up if you are just below a cutoff, they are just a straight calculation. No grades will be bumped up to the next Letter grade or the next +/–. If I lower the cutoffs or change a grade for one student, then I have to be fair to all

students and then there will always be the next student who is just below the a new cutoff and that is not fair to them.

Homework

There are **3** homework assignments in this course. Assignments may include problems similar to the lecture examples or discussion problems. Each assignment is worth **10** points. The lowest grade will be dropped when calculating the final grade. To receive full credits, detailed steps of derivation are required. The **deadline** for submission will be **the day before the exam date** (see Course Schedule), and all submissions must be made electronically via **Canvas by Noon** on the due date. **Late submissions will not be accepted, as I will upload the solution right after the deadline.** Please ensure that your submissions are in **PDF** format. You have the flexibility to compile your solutions using software like Word, LaTeX, R Markdown, or any other tool of your choice. For instance, you can write your solutions on paper, scan or take a picture of them, and convert them into a PDF file using Word. It might also be possible to solve problems on your iPad and export it into a PDF file.

Exams

There will be **2** in-person midterms scheduled at 12:10 - 1:00 pm (50 minutes), **Aug 13rd** (Wednesday), and **Aug 26th** (Tuesday) during class. The in-person final exam is scheduled at 12:10 - 1:50 pm (100 minutes) **Sep 9th** (Tuesday) during class.

- Exam questions will be similar in phrasing, content, and difficulty to those encountered in lectures, discussion sections, homework, and problem sets. While no separate practice exam will be provided, the additional problem sets are designed to serve as effective review materials and offer a representative preview of the exam format.
- Exams will be handwritten, not Scantron, and require you to show your work for full credit. Paper exams will not be returned to students.
- Exams will be graded in Gradescope. Please do not register for Gradescope on your own, you will be added automatically through Canvas enrollment, and you may receive an email that you are registered after the first exam.
- Students are required to bring their own **calculators**. Notebooks and textbooks are not permitted during the exam. No personal notes or cheat-sheets will be allowed. However, a formula sheet with relevant formulas and essential statistical tables will be provided. A formula sheet, any statistical tables, and scratch paper needed will be provided on the exam but turned in along with your exam form. However, only the exam form will be considered for grading.
- There are **NO make-up exams** and **no early exams** will be given. Missing an exam without proper documentation will result in a score of zero for that exam. If a student misses the final due to a legitimate and documented reason and has at least a grade of D, an incomplete will be assigned, and the student will have to retake the final exam within the next three quarters. Please see the University policies for Incomplete grade requests online for more detail or talk to your advisor.

- You will need your **Student ID** and will be checked for **all** exams.
- The **Midterms** will most likely be **50 minutes long** and not cumulative. The **Final Exam** is **cumulative** and will most likely be **100 minutes** long. The Final will be weighted more heavily toward the newest material at the end of the course that builds on the material from Midterm 1 and Midterm 2, but will also directly re-test you on the material from Midterm 1 and Midterm 2 since it is cumulative.

Communication

The class will be using **Canvas** to distribute all resources and make announcements. We will be using **Piazza** for **class discussion**. The system is highly catered to getting you help fast and efficiently from classmates, and myself. If you have any problems or feedback for the developers, email team@piazza.com. The instructor and TA will monitor the discussion board but will try to minimize their influence on the process. You can access Piazza in the navigation tab on Canvas or at https://piazza.com/class/mdtm01ehy5s7w. When you use Piazza:

- Please post **ALL** student questions regarding general course content, homework questions, lecture materials, or the logistics of the class on Piazza. You can access Piazza directly from Canvas or the Piazza app on your phone. This way, the entire class sees all the questions, all the answers, and all the follow-ups – trust us, everyone benefits this way, and it is much more efficient.
- You are **REQUIRED** to read **ALL** posts on Piazza as the absolutely bare minimum and your active participation including answering and giving hints to your fellow students is part of your grade! Your grade is based on the percentage of posts and follow-ups that you have read, and bonus points to make up for any missed posts may be given every time one of your fellow students, or Instructor gives you a good question / thumbs up / thanks / helpful / etc. on your post. Bonus points max out at 100% for your Piazza participation.
- Posts on Piazza are anonymous to your fellow students so they will not see your name, unless you choose to do so. This should encourage you to ask questions even if you think it is a dumb question. There are no dumb questions except for the questions that you do not ask!
- Posts on Piazza will **not** be anonymous to the Instructor so please be respectful to your fellow students.
- Please be respectful of the Instructor's, and your fellow students' time. If you are not keeping up with reading every single post, then it is not fair to expect somebody else to spend their time answering your question, especially if it is a question that has already been asked and answered, especially multiple times. In this case, you might get a response that simply says, "Please read previous posts."
- Please try not to give away entire solutions – usually your fellow classmates only need a hint to steer them in the right direction to get passed the next step in the problem where they are stuck and they are the ones who have to be able to do the problem on the exams without any help so force them to learn it.
- Please do not post questions like "how do I do this problem" and expect somebody to write up a full solution for you, that takes an incredible amount of time. You are on the hook to show what you have tried so far, how you started the problem, and where you are stuck.

- If you have a follow-up question, then of course, please post a follow-up as a reply **in the same thread** below the original post and mark it as **Unresolved** on Piazza so that it flags it for us to read, especially if it is far down the list.
- Piazza Participation is checked at random points throughout the quarter without any announcement and I do a final check right around the Final Exam.
- Having said all that, I am genuinely very happy to help you with every single follow-up question until you are absolutely sure that you fully understand the problem or concept (really! that is what I am here for).

Code of Conduct

You are expected to strictly adhere to the UCD Code of Academic Conduct. Cheating, plagiarism, or other violations will not be tolerated; they will be referred immediately to Student Judicial Affairs, and necessitate a failing grade. It is very important that you familiarize yourself with the code of conduct: https://ossja.ucdavis.edu/code-academic-conduct.

Accomodations

UC Davis is committed to educational equity in the academic setting and serving a diverse student body. I encourage all students interested in learning more about the Student Disability Center (SDC) to contact them directly at https://sdc-portal.ucdavis.edu, sdc@ucdavis.edu or 530-752-3184. If you are a student who requires academic accommodations, send me your SDC letter of accommodation as soon as possible, within the **first week** of this course.

QUARTER DATES & DEADLINES:

Please familiarize yourself with the quarter dates and deadlines around drop, withdrawal, and waitlist deadlines, etc: https://registrar.ucdavis.edu/calendar/academic-calendar.

Use of large language models (LLMs)

You may use LLMs such as ChatGPT, Grok, etc. for your learning purposes (e.g., to understand problems deeper and get a hint of rigorous derivation) but you are responsible for any errors in the outputs. Moreover, their direct use in preparing your homework submissions is not permitted (just copy and paste). You are also required to acknowledge in your submission how you used LLMs, if you indirectly benefited from them. Any suspected violation may be reported to OSSJA.

Disclaimer

This syllabus is subject to change at the discretion of the instructor in the event of extenuating circumstances or to improve the course.