

MGT 403A
Data Analysis for Managers
Graduate School of Management
UC Davis, Fall 2025 v1.0

Course Description

This course introduces statistics and data analysis for managerial decision-making. Topics include descriptive statistics, statistical inference, and application of data-analytic methods to problems in marketing, finance, accounting, production, operations, and public policy. The course emphasizes practical tools and critical thinking to help students extract insights from data, evaluate uncertainty, and make evidence-based recommendations.

Learning Objectives

By the end of this course, students will be able to:

- Summarize and visualize business data clearly and effectively.
- Apply core statistical methods—descriptive statistics, estimation, hypothesis testing—to real-world management problems.
- Build and interpret regression models for understanding relationships, forecasting outcomes, and informing strategy.
- Evaluate the reliability and limitations of empirical results in different business contexts.
- Communicate data-driven insights to a managerial audience.

Instructor

Sebastian Calonico. Office hours by appointment: scalonico@ucdavis.edu

Lectures

Fridays, 9am-12:50pm. GH-1213. Class starts Sept 26, ends Dec 12.

Active contributions to class discussions and case activities are expected. Attendance to class is mandatory. Repeated unexcused absences will negatively affect your grade.

Textbook

Keller, G. (2022). *Statistics for management and economics* (12th ed.). Cengage Learning.

Grading

Grades will be based on assigned homework, a midterm exam, and a group empirical project.

Assignments	20%
Midterm	40%
Empirical Project	40%

Statistical Software

We will make extensive collaborative use of Excel in class. Excel will be our primary tool for data analysis, visualization, and statistical calculations. All students are expected to be comfortable with basic spreadsheet functions and will learn additional Excel tools for data analysis as part of the course. Assignments and in-class exercises will emphasize practical Excel skills that can be applied immediately in business settings.

Homework

Four homework assignments will be given over the quarter. You may collaborate with classmates, but you must submit your own work and not copy directly from others. All homework must be converted to PDF format and submitted via Canvas by the assigned date and time. A full homework schedule is provided in the course table below.

Midterm Exam

The midterm exam is held in class and is open book. You may refer to your class notes, textbooks, and printed course materials during the exam. However, electronic devices (laptops, tablets, phones, calculators, etc.) are not permitted.

Empirical Project

An important part of the course is applying the concepts to address real business questions. You are required to complete a final project analyzing a real-world dataset of your choice. The project can be completed in groups of up to four students. I strongly recommend that you begin thinking about your project after the first day of lecture. To avoid end-of-quarter crunch, the project is structured in three phases:

- **Project Proposal:** A 1–2 page proposal outlining your research question, dataset, and planned methods. I will provide feedback and discuss your ideas in class and during office hours.
- **Oral Group Presentation:** A short in-class presentation where your group presents the research question, dataset, main analysis, and plan for the final report. This allows you to receive feedback and refine your approach.
- **Final Written Report:** A comprehensive written report that continues and completes your analysis from the oral presentation. The report should clearly present your objectives, data, methods, results, and managerial recommendations.

I will guide and monitor your progress throughout the quarter, offering feedback during class and office hours. A suggested format for the final project report will be provided. By the end of the project, you should gain confidence in performing exploratory data analysis, applying statistical inference concepts, and communicating results effectively in both oral and written formats.

Code of Conduct

Here is a link to the UC Davis Code of Academic Conduct: <http://sja.ucdavis.edu/files/cac.pdf>

Disability Accommodations

Any student who feels they may need an accommodation based on the impact of a disability should contact me privately to discuss specific needs. In addition, students should contact the Student Disability Center (SDC) at (530) 752-3184, sdc@ucdavis.edu, as soon as possible to ensure that accommodations can be implemented in a timely manner. All accommodations must have prior approval from the SDC, based on medical or other appropriate documentation.

Use of AI Tools (e.g., ChatGPT)

You are welcome to use AI tools such as ChatGPT to support your learning in this course—for example, to review concepts, generate practice problems, or get help debugging code. These tools can be valuable for clarifying ideas and practicing applications. However, there are important limitations and risks:

- Accuracy: AI tools sometimes provide incorrect or misleading answers, especially in statistical contexts. You are responsible for verifying any output against course materials.
- Over-reliance: Relying on AI for answers without working through the reasoning yourself will undermine your learning and may leave you unprepared for exams and business applications.
- Assessment integrity: Some assignments and all exams are designed to assess your understanding. Submitting AI-generated answers without comprehension is considered a violation of academic integrity.

In short, AI can be a useful supplement, but it is not a substitute for learning the material. You are expected to use these tools thoughtfully and critically, with the goal of deepening your understanding rather than replacing it.

Class Schedule and Due Dates

Week	Class Date	Chapter Section	Assignment due	Topic sketch
1	Sep 26	1, 2, 3		Fundamentals of applied statistics I
2	Oct 3	7.1, 8.1, 8.2, 9.1	HW 1	Fundamentals of applied statistics II
3	Oct 10	10.1, 11.1, 12.1	HW 2	Fundamentals of applied statistics III
4	Oct 17	16	HW 3	Introduction to regression analysis I
5	Oct 24	17	HW4	Introduction to regression analysis II
6	Oct 31			Midterm Review
7	Nov 7			In-class Midterm Exam
8	Nov 14	18.1	EP Proposal	Further topics in regression analysis I
9	Nov 21	18.2		Further topics in regression analysis II
10	Dec 5			In-class Group Presentations
11	Dec 12			Final Report Submission (online)

Fundamentals of applied statistics I

- Introduction to Statistics
- Statistical Applications in Business
- Numerical and Graphical Descriptive Statistics.

Fundamentals of applied statistics II

- Random Variables and Their Properties
- Expectation and Conditional Expectation
- The Normal Distribution
- Sampling Distributions

Fundamentals of applied statistics III

- Introduction to Estimation
- Statistical Inference: Hypothesis Testing, Confidence Intervals, and Sampling Distributions

Introduction to regression analysis I

- Simple Linear Regression Model
- Statistical Inference and Assessing Model Fit

Introduction to regression analysis II

- Multiple Regression Analysis
- Statistical Inference with Multiple Predictors

Further topics in regression analysis I

- Fitting Curves to Data
- Assessing the Assumptions of the Regression Model
- Using Indicator and Interaction Variables
- Variable Selection

Further topics in regression analysis II

- Qualitative Dependent Variables
- The Linear Probability Model
- Introduction to Logistic Regression