Course Syllabus

University of Colorado Boulder

Introduction to Statistics with Computer Applications

Economics 3818-020 | Spring 2026

Instructor	Jack Novak
Email	Jackson.Novak@Colorado.edu
Office Hours	Econ 313, MW 2:30 p.m. – 4:00 p.m. and by appointment
Lecture Classroom	DUAN G2B47
Class Meeting Time	MWF 1:25 p.m. – 2:15 p.m.
Teaching Assistant	Michael Karas
TA Email	Michael.Karas@Colorado.edu
TA Office	Econ 309C
TA Office Hours	*TBD*
Recitation 021	Classroom: KTCH 1B44 | Meeting Time: T 3:35-4:25p
Recitation 022	Classroom: KTCH 1B44 | Meeting Time: Th 12:20-1:10p

1. Course Overview

In this course, we will explore the principles of statistical reasoning and inference. To this end, we will cover the following topics: describing data with graphs and numbers; basic probability rules; sampling distributions of test statistics; hypothesis testing and confidence intervals across multiple settings; and knowledge of simple regression.

This foundational course is essential to your success in the study and long-run understanding of economics. CU Economics 4000-level courses require knowledge of basic statistical reasoning and understanding, and the required econometrics course builds directly off of this course. Moreover, this course will provide invaluable statistical reasoning skills that will pay dividends throughout your career.

The course consists of five closely related parts:

1. Exploring data using visual and numerical measures; summary measures and relationships between variables.
2. Basic probability theory, popular probability distributions, and mathematical expectation.
3. Sampling distributions and their properties; properties of estimators; confidence intervals; hypothesis testing.
4. Applied statistical inference: inference about a population mean; differences in two means; a single proportion; differences in two proportions.
5. Correlation and simple regression analysis, including inference for regression.

2. Textbook

The Basic Practice of Statistics, 9th Edition, by David Moore, William Motz, and Michael Fligner.

The course will use Macmillan Publishing's **Achieve** homework system, which includes an electronic version of the book. You will sign up for the Basic Practice of Statistics + Achieve System through Canvas. Detailed instructions for signing up are provided on the course Canvas site.

3. Class Technology

3.1. Achieve Learning System

The course will use the Macmillan Publishing Achieve Learning System for Learning Curve, Homework, and Quiz assignments. Instructions to sign up for Achieve through Canvas are in the Getting Started Module.

3.2. Handheld Calculator

You will need a handheld calculator to do calculations during in-class exams. You cannot use your phone or borrow your neighbor's calculator during exams. Graphing calculators are allowed but not required.

3.3. R Computer Applications

R is a free programming language available for Mac, Windows, and Unix operating systems. It is installed on computers in most University computer labs and can be downloaded online. You will use the RStudio interface to complete R exercises, and we will spend some class/recitation time working on them.

A free resource: *Modern R with the tidyverse* by Bruno Rodrigues: https://b-rodrigues.github.io/modern_R/

4. Tentative Course Schedule

The table below outlines the planned order and approximate timing of course topics. Most modules span roughly one week, though pacing may vary depending on class progress. Exact dates and assignment deadlines will be posted on Canvas.

Module	Approx. Timing	Topics
Module 0	Week 1	Introduction to R; Getting Started
Module 1	Week 2	Graphs; Describing Distributions
Module 2	Week 3	Normal Distributions; Correlation
Module 3	Week 4	Regression; Two-Way Tables
Module 4	Week 5	Sampling; Experiments
Midterm Exam 1 (covers Modules 0–4)		
Module 5	Week 6	Probability; Rules of Probability
Module 6	Week 7	Binomial Distributions; Mathematical Expectation
Spring Break		
Module 7	Week 9	Data Ethics; Sampling Distributions
Module 8	Week 10	Confidence Intervals; Tests of Significance
Midterm Exam 2 (covers Modules 5–8)		
Module 9	Week 11	Inference in Practice; Inference about a Population Mean
Module 10	Week 12	Inference Comparing Two Means; Population Proportions
Module 11	Week 13	Comparing Two Proportions; Review
Module 12	Weeks 14–15	Inference for Regression
Final Exam: April 30, 1:30–4:00 p.m.		

5. Prerequisites

Econ 2010 and Econ 2020 and either Econ 1088 or Math 1081 or Math 1300 or Math 1310 or APPM 1350 (all minimum grade C-). Restricted to students with 22–180 units completed.

6. Course Evaluation

Component	Percent
Attendance Check-ins	10%
Learning Curve	10%
Module Homework Exercises	15%
Module Quizzes	10%
R Exercises	10%
Exam 1	10%
Exam 2	10%
Final Exam	15%
Recitation	10%

6.1. Notes on Grading Components

Attendance Check-ins (10%). Attendance will be taken through brief, unannounced in-class check-ins on randomly selected lecture days. A check-in will consist of a short, low-stakes task completed during class (e.g., responding to one or two simple questions based on that day's material).

Check-ins are graded primarily on completion and are designed to encourage attendance and engagement rather than test mastery. The lowest three attendance scores will be dropped to accommodate unavoidable absences.

Learning Curves (10%). These activities are completed through Achieve and are intended to expose you to book material before class. Must be completed by noon on the assigned day. These deadlines are firm and cannot be extended.

Homework/Quizzes in Achieve (25%). Module homework exercises and quizzes are completed in Achieve. Late submissions are allowed up to 10 days with a 10% penalty per day late.

R exercises (10%). Several assignments, submitted on Canvas by the specified time. The same late policy applies: 10% per day.

Exams (35%). Midterms 1 and 2 are each worth 10% and the Final is worth 15%. With prior approval from the instructor, a missed midterm may have its weight shifted to the final exam. Requests must be made before the scheduled exam time, except in cases of emergencies.

Recitation (10%). Recitation will present an opportunity to practice the course material. Recitations will be graded based on attendance.

7. Class Support / Help

1. The primary help options are the professor and teaching assistant during regular office hours.
2. The department offers a free drop-in tutoring lab (see Canvas for current information).
3. Private tutors provide one-on-one help for a fee (see Canvas/department list).

Statistics is a cumulative subject, and I am here to help you stay on track. If you find yourself feeling overwhelmed, please reach out to me or the TA early.

Important Dates

- **January 8 (Thursday):** First day of classes
- **February 23-27:** No recitation. All classes canceled Feb. 26 for University reading day.
- **March 16–20:** Spring break (no classes)
- **April 24 (Friday):** Last day of classes
  Note: This day follows a Monday schedule to equalize M–F class meetings.
- **April 27–May 1:** Final examination period

8. University Policies

8.1. Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations may include (but are not limited to) plagiarism (including use of paper-writing services or technology such as essay bots), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. Students found responsible may receive resolution outcomes and academic sanctions. See the Honor Code page for more information.

8.2. Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner. Disability Services determines accommodations based on documented disabilities in the academic environment. Contact Disability Services at 303-492-8671 or DSinfo@colorado.edu. If you have a temporary medical condition, consult the Temporary Medical Conditions information on the Disability Services website. If you have a temporary illness, injury, or required medical isolation requiring adjustment, contact the professor immediately.

8.3. Accommodation for Religious Obligations

Campus policy requires reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. Communicate the need for a religious accommodation in a timely manner. See the campus policy on religious observances for details.

8.4. Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information does not always align with how they identify. If you want your preferred name and/or pronouns to appear on rosters and in Canvas, see the Registrar's instructions for changing personal information in university systems.

8.5. Classroom Behavior

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics involving race, color, national origin, sex, pregnancy, age,

disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, marital status, political affiliation, or political philosophy.

See also: Student Classroom and Course-Related Behavior Policy; Student Code of Conduct; Office of Institutional Equity and Compliance.

8.6. Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive and welcoming environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, assault), intimate partner abuse (dating/domestic violence), stalking, and related retaliation.

Contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or OIEC@colorado.edu. Faculty and graduate instructors are required to inform OIEC when made aware of incidents.

8.7. Mental Health and Wellness

If you are struggling with personal stressors, mental health, or substance use concerns impacting academic or daily life, contact Counseling and Psychiatric Services (CAPS) in C4C or call (303) 492-2277 (24/7).

Free and unlimited telehealth is also available through AcademicLiveCare (see their site for details and additional campus wellness resources).

8.8. Use of AI Tools

Generative AI tools are not a substitute for learning, and reliance on such tools is strongly discouraged. You may not submit AI-generated text or code for any assignment. Submissions with unambiguous AI output (e.g., meta-prompts) may receive a score of zero and be referred under the University Honor Code.