

University of Colorado – Boulder
Syllabus – Fall 2022
ECON 3818 - Introduction to Statistics with Computer Applications

Instructor: Dr. Shawn Swanson
Office: ECON 14b
Office Hours: MW 11:00 – 12:00

Email: shawn.swanson@colorado.edu
Zoom: <https://cuboulder.zoom.us/my/ask.shawn>

TA: Anand Butler
Office: ECON414

Email: Anand.butler@colorado.edu
Office Hours: Wed. 12:15 – 1:15, 2:30 – 4:30

Course Description

Statistics is an important subject in the study of economics, and a directly marketable skill. In this course we will cover the following concepts: visual and numerical exploration of data, basic probability theory and probability distributions, mathematical expectation, sampling distributions and their properties, properties of estimators, confidence intervals, hypothesis testing, applied statistical inference, correlation, regression analysis, and inference in regression analysis.

Prerequisites

Requires prerequisite courses of ECON 2010 and 2020 and either ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330 or APPM 1340/1345 or APPM 1350 or FNCE 2010 (all minimum grade C-). Restricted to students with 22-180 units completed.

Required Textbook

(Day 1 Digital Access) - The Basic Practice of Statistics + Achieve
By David Moore, William Notz, and Michael A Fligner

This includes access to an online version of the textbook. (Hardcopies are also available for purchase.)

To keep the cost of your course materials as low as possible and access to those materials as convenient as possible, we have collaborated with the CU Book Store and the publisher to deliver those materials through a program called “Day 1 Digital Access”, which will appear on your tuition and fee bill as “Day 1 Digital Access”.

You will receive access to all your course materials, digitally, on the first day of classes, through the course Canvas page.

- You will see a “Day 1 Digital Access” charge on your tuition and fee bill for: \$85.61. This is a guaranteed lowest price, discounted by the publisher, and not available outside this course.
- You have the option to opt out. This means: you won’t pay for anything, but you lose all access to the course materials, including homework.
- You can opt out by: using a link in a reminder email you will receive with the subject heading “Day 1 Digital Access”.
- You must opt out no later than September 7th, otherwise you will be charged for the materials.
- Please keep in mind that “opting out” means that your access to these materials will be turned OFF, and you will have no way to complete assignments.

Canvas

I use Canvas extensively to keep this course organized and make announcements. You are responsible for any announcement posted to Canvas, so check it regularly. Lecture notes and recordings as well as homework assignments and R exercises can be found on Canvas. The recorded lectures are a useful tool, which will allow you to slowdown, fast forward, and pause lectures to increase comprehension. They also allow you to watch lectures you may have missed. However, watching recorded lectures does not replace attending the live lectures which included graded clicker questions. All grades will be posted on Canvas as soon as they are available.

Attendance

Class attendance is necessary for success in this course and therefore mandatory. To give students an external commitment device, attendance will be taken indirectly through the use of graded clicker questions. *If you will have an extended absence, please notify me as soon as possible. If you anticipate an excused absence, please notify me PRIOR to missing any classes, assignments, or exams.*

Office Hours

Office hours are the best way to get extra help if needed. I would be happy to schedule a time outside of office hours if a scheduling conflict prevents you from coming during the assigned hours. I'm happy to meet in-person or via Zoom.

Cheating

Don't do it. You will get caught, fail the course, and be reported to the Honor Code Council.

Electronic Device Policy

Please silence electronic devices during lectures. You are welcome to use electronic devices for note taking and accessing learning materials online. However, do not use electronic devices during class time for non-class activities (i.e. social media, etc), or you will be asked to turn it off and put it away.

Communication Policy

Email will be my primary form of communication with the class:

- I will use your CU email address for class communications, so check your CU mailbox frequently.
- I will answer you as soon as possible. Please allow 24 hours for a response.
- Please refer to the syllabus to answer questions, before contacting me.
- Questions on course material are often more easily and thoroughly answered in person. Please use my office hours as your primary means of obtaining help with course material.
- Under no circumstances can I provide grades through email due to Family Educational Rights and Privacy Act (FERPA) regulations, since emails are not considered secure. Grades will be available on Canvas.

Technology Requirements

iClickers:

We will be using iClicker to enhance active learning and participation in this course. Unfortunately, the space we are in has insufficient wifi for the entire class to reliably use iClicker mobile polling on your personal devices. Therefore, you will need to obtain an iClicker + remote for use in class. You may be able to check one out from the Norlin circulation desk for the semester, on a first-come, first-served basis. You will also need to have an iClicker student app account, and register your clicker there. You will not be able to use the iClicker student app to vote in class. Student resources for iClicker can be found [here](#). *You will receive 1 point for answering a question and an additional point for answering correctly.*

RStudio Desktop: R is a free programming language that is utilized primarily for data analysis. We will spend time throughout the course working on R exercises using the RStudio interface. The RStudio Desktop interface can be download [here](#). Upon initial startup of the interface, you will be prompted to install R, if you have not already done so. Follow the prompts as directed.

Grading

It is important to note, there will be no makeup work or makeup exams in this class. In fairness to everyone, there are no exceptions to this rule. Note that late assignments will not be accepted, instead I will drop your lowest two homework assignments, lowest two R exercises, lowest two quizzes, and lowest five clicker scores.

Your total grade in this course will be determined as follows:

• Clickers	10%	• Midterm 1	15%
• Recitation	10%	• Midterm 2	15%
• R exercises	10%	• Final	20%
• Homework	10%	• Extra Credit	3%
• Quizzes	10%		

Recitation: Your grade in recitation account for 10% of your final grade. The materials provided in recitation are crucial for your success in this course. Your TA will determine your recitation grade.

Homework, quizzes, and R: On Canvas you will find 13 online homework assignments, 11 quizzes, and nine R exercises. We will work on several R exercises together in class on the days listed in the tentative schedule. On these days you will need to bring your laptop. R exercises and homework are due Fridays before 11:59 PM unless otherwise announced (No Exceptions).

Exams:

There are 3 midterm exams, and while they are not explicitly cumulative, material does naturally build upon itself. The final exam will be *cumulative* and must be held per university policy. **The final exam is scheduled for Tuesday, Dec. 13, 4:30–7:00 p.m.** The University's final exam policy can be found [here](#). Unsubstantiated or illegible answers will receive partial credit at most. Exams will be open notes. Only basic scientific calculators will be permitted, no computers, cell phone, or graphing calculators. All exams will take place in the regular classroom unless otherwise noted. There will be no makeup exams. If you miss an exam and have appropriate documentation (e.g., illness, bereavement, university sanctioned event) your other coursework will be appropriately reweighted, otherwise you will receive a zero for the exam.

Extra credit:

There are extra credit assignments found on Canvas. The extra credit grade will be calculated by adding 3% times your extra credit percentage score to your overall grade. Since it is added to your final grade, any extra credit can only increase you grade. All extra credit will close Dec 8th.

Letter Grades:

Scores may be curved at the instructor's discretion. Your (curved) final course grade will automatically be increased up to 0.5% to meet any grade cutoff. No further grade adjustments are available. There will be no extra credit. Letter grades will be assigned as follows:

Percentage	Grade	Percentage	Grade
94-100	A	73-76	C
90-93	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-
77-79	C+	0-59	F

Course Resources and Recipe for Success

Because the class is inherently cumulative, it is essential to invest time early. This will make the rest of the semester much more manageable.

Let me be clear, I want you to be successful in this course. I will do whatever I can to help you learn. Therefore, there are numerous resources for you to succeed.

Office Hours: This is an excellent opportunity to get additional clarification and get one-on-one instruction. I love working with students during office hours. It is among the most rewarding things I get to do as an instructor, so please take advantage. If a scheduling conflict prevents you from attending my office hours, I will be happy to schedule a time with you. In addition to my office hours, your TA will also hold office hours.

Econ Tutoring Lab: The Economics department provides a free tutoring lab. Information can be found on the department's website: <https://www.colorado.edu/economics/undergraduate-program>

Private Tutors: Private tutors are available for a fee. Information can be found on the department's website: <https://www.colorado.edu/economics/undergraduate-program>

There is a strong correlation between attendance and homework with a student's overall grade. The correlation coefficients are greater than 0.60. I would be remiss if I did not note that correlation does not imply causation. Nonetheless, imitating the approach of successful students is not a bad strategy. Take this course seriously. Use the available resources. Keep up with the course and do not fall behind.

Classroom Behavior

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the [classroom behavior](#) policy, the [Student Code of Conduct](#), and the [Office of Institutional Equity and Compliance](#).

Requirements for COVID-19

As a matter of public health and safety, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. CU Boulder currently requires COVID-19 vaccination and boosters for all faculty, staff and students. Students, faculty and staff must upload proof of vaccination and boosters or file for an exemption based on medical, ethical or moral grounds through the MyCUHealth portal.

The CU Boulder campus is currently mask-optional. However, if public health conditions change and masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct and Conflict Resolution. For more information, see the policy on classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the "Accommodation for Disabilities" statement on this syllabus.

If you feel ill and think you might have COVID-19, if you have tested positive for COVID-19, or if you are unvaccinated or partially vaccinated and have been in close contact with someone who has COVID-19, you should stay home and follow the further guidance of the Public Health Office (contacttracing@colorado.edu). If you are fully vaccinated and have been in close contact with someone who has COVID-19, you do not need to stay home; rather, you should self-monitor for symptoms and follow the further guidance of the Public Health Office (contacttracing@colorado.edu).

Accommodation for Disabilities

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 so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website. *You*

must provide me with your disability letter and contact me to make suitable arrangements at least **two weeks** prior to any exam.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the [Honor Code](#). Violations of the Honor Code may include, but are not limited to: plagiarism, 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 (honor@colorado.edu); 303-492-5550). Students found responsible for violating the [Honor Code](#) will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found on the [Honor Code website](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, protected-class discrimination and harassment, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these policies, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, [reporting options](#), and support resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of any issues related to these policies regardless of when or where they occurred to ensure that individuals impacted receive information about their rights, support resources, and resolution options. To learn more about reporting and support options for a variety of concerns, visit [Don't Ignore It](#).

Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please notify me in advance of missing any classes, assignments, or exams.

See the [campus policy regarding religious observances](#) for full details.

Tentative Course Schedule:

Week	Tentative Course Outline	Due Dates
Week 1 (Aug 22 - Aug 26)	<ul style="list-style-type: none"> • Introduction • Chapter 1 Picturing Distributions with Graphs • Chapter 2 Describing Distribution with Numbers 	<ul style="list-style-type: none"> • None
Week 2 (Aug 29 - Sep 2)	<ul style="list-style-type: none"> • R Day 1 (Monday, August 29th – Bring laptop) • Chapter 12 Introduction to Probability • Chapter 13 General Rules of Probability 	<ul style="list-style-type: none"> • HW1 (Ch 1,2) • R1, R2
Week 3 (Sep 5 - Sep 9)	<ul style="list-style-type: none"> • Labor Day (No class 9/5) • Chapter 14 Binomial Distributions • Chapter 3 The Normal Distributions 	<ul style="list-style-type: none"> • HW2 (Ch12,13) • Quiz1 (Ch 1,2)
Week 4 (Sep 12- Sep 16)	<ul style="list-style-type: none"> • Distribution • Expectation • Variance 	<ul style="list-style-type: none"> • R3 • HW3 (Ch 3,14) • Quiz2 (Ch 12,13)
Week 5 (Sep 19 - Sep 23)	<ul style="list-style-type: none"> • R Day 2 (Monday, September 19th – Bring laptop) • Chapter 8 Producing Data: Sampling • Chapter 9 Producing Data: Experiments 	<ul style="list-style-type: none"> • R4 • HW4 (D,E,V) • Quiz3 (Ch 3,14)
Week 6 (Sep 26 - Sep 30)	<ul style="list-style-type: none"> • Estimation • Chapter 15 Sampling Distributions 	<ul style="list-style-type: none"> • HW5 (Ch 8,9) • Quiz4 (Ch D,E,V)
Week 7 (Oct 3 - Oct 7)	<ul style="list-style-type: none"> • Midterm Review • MT1 (Wednesday, September 28th) • R Day 3 (Friday, October 7th – Bring laptop) 	
Week 8 (Oct 10 - Oct 14)	<ul style="list-style-type: none"> • Chapter 16 Confidence Intervals: The Basics • Chapter 17 Tests of Significance: The Basics 	<ul style="list-style-type: none"> • R5 • HW6 (E,15) • HW7 (16) • Quiz5 (Ch 8,9)
Week 9 (Oct 17 - Oct 21)	<ul style="list-style-type: none"> • Chapter 18 Inference in Practice • R Day 4 (Wednesday, October 19th – Bring laptop) • Chapter 20 Inference about a population mean 	<ul style="list-style-type: none"> • R6 • HW8 (Ch 17) • Quiz6 (Ch 15,16)
Week 10 (Oct 24 - Oct 28)	<ul style="list-style-type: none"> • Chapter 20 Inference about a population mean • Chapter 21 Comparing Two Means 	<ul style="list-style-type: none"> • R7 • HW9 (Ch 18) • Quiz7 (Ch 17)
Week 11 (Oct 31 - Nov 4)	<ul style="list-style-type: none"> • Chapter 6 Two Way Tables • Chapter 4 Scatter Plots 	<ul style="list-style-type: none"> • HW10 (Ch 20,21) • Quiz8 (Ch 18)
Week 12 (Nov 7 - Nov 11)	<ul style="list-style-type: none"> • Midterm Review • MT2 (Wednesday, November 9th) • Chapter 5 Regressions 	
Week 13 (Nov 14 - Nov 18)	<ul style="list-style-type: none"> • Chapter 5 Regressions • Chapter 26 Inference for Regressions 	<ul style="list-style-type: none"> • R8 • HW11 (Ch 4,6) • Quiz9 (Ch 20,21)
Week 14 (Nov 21 - Nov 25)	<ul style="list-style-type: none"> • Fall Break (No classes 11/21 – 11/25) 	
Week 15 (Nov 28 - Dec 2)	<ul style="list-style-type: none"> • Chapter 26 Inference for Regressions • R Day 5 (Friday, December 2nd – Bring laptop) 	<ul style="list-style-type: none"> • HW12 (Ch 5) • Quiz10 (Ch4,6)
Week 16 (Dec 5 - Dec 9)	<ul style="list-style-type: none"> • Review • Reading Day (No class 12/9) 	<ul style="list-style-type: none"> • R9* • HW13 (Ch 26)* • Quiz11 (Ch 5)*

All assignments are due Friday at 11:59 PM unless otherwise announced.

****Note, week 16 assignments are due Thursday due to reading day.***