

ECON 3818-020
INTRODUCTION TO STATISTICS WITH COMPUTER APPLICATIONS

MWF 1:00 - 1:50 pm in room ECON 119
Fall 2019

Instructor:	Solveig Delabroye	Office Hours:	Wed & Thu 2 – 3pm & by apptmt.
Email:	solveig.delabroye@colorado.edu	Office:	ECON 114
TA:	Hoyn Kim	Office Hours:	Wed 4-5 pm & Thu 11 am – noon
Email:	hoyn.kim@colorado.edu	Office:	ECON 114
Recitation 21:	Mon 5–5:50 pm in STAD 135		
Recitation 22:	Wed 3–3:50 pm in HLMS 263		

Course Information

Course Website: <https://canvas.colorado.edu/>

Required Ebook and homework package: Sapling Plus for *The Basic Practice of Statistics* by David S. Moore, William I. Notz, and Michael A. Fligner, 8th ed., 2018 ([access through Canvas](#), 14-day free trial, then \$ 90.99. Course ID 100126).

iClicker for extra credit An iClicker remote or a registration to iClicker Reef to use with a smart-phone or computer app (<https://www.iclicker.com/pricing>, 14-day free trial, then \$14.99 for 6-month access).

Course Description: From satellites continuously orbiting the globe to social network like Facebook or LinkedIn, from polling organizations to United Nations observers, data are being collected everywhere and all the time. Knowledge in statistics provides you with the necessary tools and conceptual foundations in quantitative reasoning to extract information intelligently from this sea of data.

It is extremely useful for your future life and career, as you will need to be able to make good use of massive amounts of information to make sound decisions, whether it be in economics or in a different field. For your academic career, this class will be essential when moving on to econometrics, the data-driven side of economics.

Computer Application: **R** is an open-source programming language available on Mac, Windows, and Unix operating systems. It is pre-installed on most University computer labs and downloadable from <https://cran.rstudio.com/> . Every other week or so we will spend time in class to work on **R** exercises through the **RStudio desktop** interface (<https://www.rstudio.com/products/rstudio/download/>). We will do a brief introduction in class during the first week.

Course Policies

General policies

- If you don't attend at least 3 lectures out of the first 5, you will be administratively dropped on Wednesday, Sept. 4th so that students who are still on the waitlist can be added.
- **There will be no make-up exams.** If you miss an exam without justification, you will get a 0. In case of documented medical or family emergency, the weight of a missed midterm will be added to the final exam, and a missed final will lead to an Incomplete (I) grade.
- **Final exam Tue Dec 17th 4:30 p.m.- 7:00 p.m.** The final is cumulative. Students who have **three or more final exams** on the same day are entitled to reschedule the last one(s). Arrangements have to be made **by November 1st**.
- If you are caught cheating in any fashion (on exams or homework) you will be given an *F* for the semester and your case will be reported to the Honor Code Council for review.
- Computers, tablets and smartphones can be useful tools for learning, but they can also generate temptation and distraction. Know yourself and try to notice how it works for you. Use of electronics is allowed in lecture, but you'll be asked to leave if it is distracting to others.
- **Prerequisites:** ECON 2010, ECON 2020, and either ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all minimum grade C-). This class uses algebra and calculus so exposure to these concepts is required.
- Students who qualify for an accommodation on exams have the responsibility to inform me **at least two weeks before** an exam.

Grades

- **Break-down:** Below is the weight given to each of the assignments you are expected to complete:

Recitation	10%	Midterm 1	20%
Sapling Homework	10%	Midterm 2	20%
R Exercises	10%	Final Exam	30%
Extra Credit (iClickers)	5%		

- **Reporting:** Grades will be uploaded to Canvas as soon as assignments are graded.
- **Curving:** Each midterm will be curved if the class average is below 73, and a curve *may* be applied to the overall course grade to get to an average of at least C+ (79). After curving, I will automatically round final course grades to the nearest full percent (a 79.49% is a 79, i.e. a C+, but a 79.50% or above is a 80, i.e. B-).

- **Grade Adjustments:** *I will not grant any request to increase your grade to meet a certain cutoff.* You will receive the grade that you earned throughout the course. *If you are concerned about your grade(s) or encounter issues* that impact your performance you should *immediately come talk to me.* I will do everything I can to help you be successful in this course.
- **Grading Scale:**

Grade	Percentage	Grade	Percentage
A	$93 \leq x$	C	$73 \leq x < 77$
A-	$90 \leq x < 93$	C-	$70 \leq x < 73$
B+	$87 \leq x < 90$	D+	$67 \leq x < 70$
B	$83 \leq x < 87$	D	$63 \leq x < 67$
B-	$80 \leq x < 83$	D-	$60 \leq x < 63$
C+	$77 \leq x < 80$	F	$x < 60$

Assignments:

- **Homework:** Weekly homework assignments are on the Sapling website (access through Canvas). They will be due by 11:59 pm most Sundays. Your lowest homework grade will be dropped.
- **Recitation:** Recitation attendance is mandatory. Not only will your grade in recitation account for 10% of your final grade in the course, but there will be material provided in recitation that is crucial for success in the course. Recitation grades are determined by take-home exercises and attendance. Refer to Hoyn Kim's (you TA) syllabus for details. **There is no recitation the first week of the semester.** To know which recitation you are registered in (21 or 22) check [my.CU.edu](http://my.cu.edu).
- **R Exercises:** There will be five simple assignments for you to complete in **R** and one data project. We will work on each one in class the week before the assignment is due (bring your laptop!). The data project will give you hands-on experience cultivating and analyzing a data set of your choice. The first exercise will not be graded. The remaining 4 exercises and data project are each 2% of your final grade. All **R** exercises will be submitted through Canvas.
- **Exams:** There will be 2 midterms and a final, all predominately multiple choice with one or two free response questions. Partial credit will be awarded wherever possible. You are allowed a 3x5" index card of hand written notes for reference during exams. Any tables required will be provided. You will only be allowed the use of a basic calculator during exams (graphing calculators and **R** are not allowed on exams).
- **Extra Credit:** The only extra credit opportunity will be through iClickers. There will be roughly 2-3 clicker questions per lecture. A maximum of five percentage points will be added to your grade for excellent clicker participation. If you're using a remote and not Reef, make sure to register your iClicker. See instructions at:
<https://oit.colorado.edu/tutorial/cuclickers-iclicker-remote-registration>

Tentative Schedule

Week	Dates	Content
1	Aug 26-30	<ul style="list-style-type: none"> • Topics: Syllabus, Variables and Distributions, Introduction to R • Chapters: 1, 2 • Due: Homework Chapters 1 and 2, Sun Sep 1 midnight.
2	Sep 2-6	<ul style="list-style-type: none"> • No class Labor Day, Sep 2 • Topics: What is Probability, Random Variables, Probability Rules • Chapters: 12, 13 • Due: R assignment 1, Wed; Homework chap 12 & 13, Sun Sep 8 midnight.
3	Sep 9-13	<ul style="list-style-type: none"> • Topics: the Binomial Distribution, the Normal Distribution, R-day 2 on Fri • Chapters: 14, 3 • Due: Homework chap 14 & 3, Sun Sep 15 midnight.
4	Sep 16-20	<ul style="list-style-type: none"> • Topics: Mathematical Expectations, Variance, Data Generation • Chapters: Expectations Handout, 8, 9 • Due: R assignment 2, Wed; Homework chap 8 & 9, Sun Sep 22 midnight.
5	Sep 23-27	<ul style="list-style-type: none"> • Topics: Sampling Distributions, Review, Midterm 1 • Chapters: 15 • Midterm 1, Fri Sep 27
6	Sep 30 - Oct 4	<ul style="list-style-type: none"> • Topics: Estimation, Central Limit Theorem, Convergence • Estimation Handout, Chapter 15 • Due: Homework chap 15 Sun Oct 6 midnight.
7	Oct 7-11	<ul style="list-style-type: none"> • Topics: Confidence Intervals, Intro to Hypothesis Testing, R-day 3 on Fri • Chapters: 16, 17 • Due: Homework chap 16 due Sun Oct 13 midnight.
8	Oct 14-18	<ul style="list-style-type: none"> • Topics: p-values, Size, Power, Inference, R-day 4 on Fri • Chapters: 17, 18 • Due: R assignment 3, Wed; Homework chap 17 & 18, Sun Oct 20 midnight.
9	Oct 21-25	<ul style="list-style-type: none"> • Topics: t-distribution, Single Sample Uses of t-distribution • Chapters: 20 • Due: R assignment 4, Wed; Homework chap 20, Sun Oct 27 midnight
10	Oct 28-Nov 1	<ul style="list-style-type: none"> • Topics: Two Sample Uses of t-distribution, Review, Midterm 2 • Chapters: 21 • Due: Homework Chap 21 Wed Oct 30 midnight, Midterm 2, Fri Nov 1
11	Nov 4-8	<ul style="list-style-type: none"> • Topics: Tests of Proportions, Covariance & Correlation • Chapters: 22, 23, 4 • Due: Homework chap 22 & 23, Sun Nov 10 midnight
12	Nov 11-15	<ul style="list-style-type: none"> • Topics: Intro to Regression, R Project • Chapters: 4, 5 • Due: Homework chap 4 & 5, Sun Nov 17 midnight
13	Nov 18-22	<ul style="list-style-type: none"> • Topics: Least Squares, R Project • Chapters: 6 • Due: Homework chap 6, Sun Nov 24 midnight
13	Nov 25-29	<ul style="list-style-type: none"> • Thanksgiving break, no class.

14	Dec 2-6	<ul style="list-style-type: none"> • Topics: Conditions, Estimation, and Hypothesis Testing in Regression • Chapters: 26 • Due: R Project Wed Dec 4; Homework chap 26, Sun Dec 8 midnight
15	Dec 9-12	<ul style="list-style-type: none"> • Topics: R-day 5 on Mon, Review before final • Due: R assignment 5, Wed Dec 11 midnight
	Finals week	<ul style="list-style-type: none"> • Reading day Fri, Dec 13th: no classes. Finals Dec 14th-18th (Sat.-Wed.) • Final Exam: Tue, Dec 17th 4:30pm – 7:00pm

University Policies

- **DISABILITY POLICY:** I am committed to providing everyone the support and services needed to participate in this course. If you qualify for accommodations because of a disability, please give me a letter from Disability Services in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu.
- **HONOR CODE:** Students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. Incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from myself and non-academic sanctions (including but not limited to university probation, suspension, or expulsion).
- **RELIGIOUS OBSERVATION POLICY:** Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. If you have a conflict, please make arrangements with me no later than the first week of the semester.
- **CODE OF BEHAVIOR POLICY:** Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty has the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which we express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance and nationalities.
- **DISCRIMINATION AND HARASSMENT POLICY:** CU Boulders policy on Discrimination and Harassment can be at www.colorado.edu/oiec/policies/discrimination-harassment. The policy on Sexual Harassment and on Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus discrimination and harassment resources can be obtained at <http://www.colorado.edu/odh>.