

## ECON 3818: INTRO TO STATISTICS WITH COMPUTER APPLICATIONS

MWF 10:10-11:00

Room: HLMS 267

**Instructor:** Dongkyu Yang

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**Office:** ECON 309B

**Office Hours:** W 9-10 am & TH 1-2 pm, or by appointment

*Please allow me 24 hours to respond to all emails. If you need help with course material, please see me during my office hours. If you need more help than can be provided in office hours, consider visiting the department's undergraduate tutor or viewing the department's private tutor list: <http://www.colorado.edu/econ/undergraduate/tutorlist.pdf>*

### Required Materials

- **Textbook:** *The Basic Practice of Statistics*. David Moore, William Notz, and Michael A Fligner.
- **Computer Application: R** is a free programming language that is utilized primarily for data analysis. We will spend time throughout the course working on **R** exercises through the **RStudio** interface.

### Prerequisites:

- Econ 2010 & 2020. Econ 1088 (or an approved similar course). This class requires algebra and calculus so exposure to these concepts is required.

## **COURSE DESCRIPTION**

Econ 3818 is an introductory course in the theory and methods of statistics. Statistics allows datasets to be transformed into usable information, analyzed for patterns and trends, which improve decision-making.

Upon completion of the course, students should be able to

- Be prepared for a future course in Econometrics – the data driven side of economics.
- Will be able to load datasets into R and perform statistical methods to gather information about the data.
- Understand the probability theory behind basic statistical tests and implement the methods.

We will study basic probability, probability distributions (especially the normal distribution), and descriptive and inferential statistics, including estimation and hypothesis testing.

Emphasis is on both theory and applications. Weekly problem sets will explore issues in statistical theory and practice. The course will use the programming language R to do data analysis on simulated and real datasets.

**Grading:**

Assignment	Percentage	Date
Homework	10%	-
R Project & Exercises	10%	-
Recitation	10%	-
Midterm 1	20%	Feb 11
Midterm 2	20%	Mar 16
Final	30%	TBD
Extra Credit	5%	-

*Curving:* Midterms may be curved individually, and a curve may be applied to the overall course grade to conform to departmental standards. I will automatically increase final course grades that are 0.5% below any grade cutoff after any final grading curve has been applied.

*Grade Adjustments:* Other than the 0.5% bump discussed above, 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) 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	$x < 60$

**Homework:** There will be weekly homework problems assigned through the Sapling website. These will be due by 11:59 pm on most Sundays. You can access assigned homework problems through Canvas. No late homework will be accepted. You cannot make up missed homework; instead, your two lowest homework grades will be dropped.

**R Project & Exercises:** There will be five simple R exercises and one data project throughout the semester. The R project will be worth 5% and the R exercises will each be worth 1% for a total of 5% toward your final grade. We will work on these assignments in class the week before they are due. An '.Rmd' (R Markdown file), a '.doc' or a '.pdf' should be turned in to Canvas.

**Recitation:** Your grade in recitation will account for 10% of your final grade in the course. Refer to your TA's syllabus to see how recitation grades are determined.

**Exams:** There will be two midterms throughout the semester. They will consist of multiple-choice questions along with a few free response questions. You will be allowed to bring a 3x5" index card with notes to refer to during the exam. Any tables required will be provided by the instructor. There will be no make-up exams. If you miss an exam and there is documentation of a medical or family emergency, then the weight of that exam will be added to the final exam. You must inform me of any accommodations **two weeks** before an exam.

**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. Make sure to register your iClickers, instructions provided here: <https://oit.colorado.edu/tutorial/cuclickers-iclicker-remote-registration>

## Tentative Course Outline

- Bring your laptop on *R days*!
- R exercises and homework are due on **Sundays at 11:59 p.m.**

Week	Topic	Due
Week 1, Jan 10-14	CH 1, CH 2, <i>R day</i>	HW-1
Week 2, Jan 17-21	CH 12, CH 13	R-1, HW-2
Week 3, Jan 24-27	CH 14, CH 3, <i>R day</i>	HW-3
Week 4, Jan 31-Feb 4	Distribution, Expectation & Variance	R-2
Week 5, Feb 7-11	Review, <b>Midterm 1</b>	HW-4
Week 6, Feb 14-18	CH 8, CH 9, CH 15	
Week 7, Feb 21-25	Estimation, CH 16	HW-5
Week 8, Feb 28-Mar 4	CH 17, CH18, <i>R day</i>	HW-6
Week 9, Mar 7-11,	CH 2, Review	R-3
Week 10, Mar 14-18	<b>Midterm 2, R day</b>	HW-7
Week 11, Mar 21-25	<i>Spring Break – No classes</i>	
Week 12, Mar 28-Apr 1	CH 21, <i>R day</i>	R-4
Week 13, Apr 4-8	CH 4, CH 6	HW-8
Week 14, Apr 11-15	CH 5, CH 26	R project, HW-9
Week 15, Apr 18-22	CH 26, <i>R day</i>	HW-10
Week 16, Apr 25-29	Review	R-5
Finals Week	<b>Final Exam</b>	

## COVID-19 INFORMATION

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- Maintain 6-foot distancing when possible,
- Wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders,
- Clean local work area,
- Practice hand hygiene,
- Follow public health orders, and
- If sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert CU Boulder Medical Services.

Students who fail to adhere to these 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 policies on [COVID-19 Health and Safety](#) and [classroom behavior](#) and the [Student Code of Conduct](#). If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the “Accommodation for Disabilities” statement on this syllabus.

Before returning to campus, all students must complete the [COVID-19 Student Health and Expectations Course](#). Before coming on to campus each day, all students are required to complete a [Daily Health Form](#).

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home and complete the [Health Questionnaire and Illness Reporting Form](#) remotely.

In this class, if you are sick or quarantined,

- If you are asymptomatic, please attend lecture via zoom.
- If you are symptomatic, please email me and we will plan how you can keep up with the material.

## UNIVERSITY POLICIES

**Students with Disabilities:** If you qualify for accommodations because of a disability, please submit to me a letter from disability services in a timely manner so that your needs can be addressed. Disability services determine accommodations based on documented disabilities. Contact: 303-492-8671, Center for Community N200.

**Religious Observance 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 contact me at the beginning of the term so we can make proper arrangements.

**Honor Code:** All students at 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. All incidents of academic misconduct shall be reported to the Honor Code Council ([honor@colorado.edu](mailto: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 the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at: <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academics/honorcode/>

**Discrimination & Harassment Policy:** The University of Colorado Policy on Sexual Harassment applies to all students, staff, and faculty. Sexual harassment is unwelcomed sexual attention. It can involve intimidation, threats, coercion, or promises or create an environment that is hostile or offensive. Harassment may occur between members of the same or opposite gender and between any combinations of members in the campus community: students, faculty, staff, and administrators. Harassment can occur anywhere on campus, including the classroom, the workplace, or a residence hall. Any student, staff or faculty member who believes s/he has been sexually harassed 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 resources available to assist individuals who believe they have been sexually harassed can be obtained at: <http://www.colorado.edu/odh/>