Syllabus, EDUC152

* EDUC152: Regression for education research
* Quarter and year
* 4 units
* Link to syllabus: <https://rucla-ed.github.io/educ152/syllabus/educ152_syllabus_draft.html>

# Short course description

This course introduces students to regression as a tool to answer questions about education. Regression is the most commonly used quantitative method in education research and can be used to answer many causal research questions and descriptive research questions. However, using regression appropriately requires thoughtfulness about what kinds of questions regression can answer, the assumptions regression relies on, the limitations of our data, and how particular variables (e.g., “race” and “gender”) are incorporated into analyses. Otherwise, regression results may be biased and may reify rather than interrogate problematic ideas. Therefore, EDUC250 teaches the fundamentals concepts of regression analysis and how these concepts can be thoughtfully applied to answer different kinds of research questions, with a particular emphasis on explicitly critical research questions. The course also emphasizes how to understand and critically assess research that uses regression. The course integrates theory and application using the ***R*** programming language. Students will be assessed through four substantive assignments, including the final, capstone assignment in which students will conduct the major steps in the life-cycle of a regression research project. \ THIS DESCRIPTION IS A BIT OVER WORD LIMIT. I’LL GET DOWN BELOW WORD LIMIT FOLLOWING FEEDBACK

# Instructor and teaching assistant

## Instructor

* Ozan Jaquette
* Pronouns: he/him/his
* Office: Moore Hall, room 3038
* Email: <ozanj@ucla.edu>
* Office hours:
  + Zoom office hours TBA
  + And by appointment

## Teaching assistant

* Name
* Pronouns:
* Email:
* Office hours:

# Extended course description

Regression is the most widely-used quantitative methodology to answer causal, and also non-causal, research questions. This section of EDUC152 will introduce students to regression with a focus on using regression to answer causal research questions, which typicaly follow the form “what is the effect of X on Y.” The course also emphasizes undersanding how to read and critically assess empirical research that uses regression.

The course integrates statistical theory and application using the ***R*** programming language. Students will work through asynchronous video lectures and lectures slides on their own. These lectures introduces statistical theory, introduces the relevant programming skills, and provides the code and real-world data so that students can practice conducting and interpreting statistical analyses. Course topics will include: fundamental statistical concepts of statistical inference; principles of causal inference; and fundamentals of multiple regression. During class time, students will work in groups to solve practical research challenges and we will discuss and deconstruct empirical research that uses regression analysis. The primary course assessments are four problem sets – including the final capstone problem set – which will be completed in groups. Each problem set will require students to apply knowledge of statistical concepts, and conduct substantive statistical analyses around a particular research question.

The course embraces using regression to answer traditional research questions (e.g., the effect of student-teacher ratio on achievement) and critical research questions (e.g., the effect of racial salience – as presented in email text – on how white university admissions officers respond to inquiries from Black prospective students). The skills this course teaches are valued by employers and are valued in the process of applying to graduate schools. After completing this course, students will be prepared to take more advanced causal inference coursework (e.g., quasi-experimental methods) and coursework that teaches the programming and data manipulation skills necessary to create analysis datasets for real research projects.

# Course learning goals

**Big-picture (conceptual) learning goals**

1. Understand principles of statistical inference for hypothesis testing
2. Understand the fundamentals of multiple regression analysis and the assumptions that must be satisfied to make inferences from these results
3. Understand how to interpret multiple regression results and communicate these results in non-technical language.
4. Develop thoughtfulness about the ethical and social dimensions of using regression for education research, for example critically examining how race variables are created and how they are incorporated into regression analyses
5. Understand the principles of causal inference, including why experiments work and how to use regression to answer causal research questions
6. Understand and critically evaluate empirical research that uses regression to answer research questions

**Skill-based learning goals**

1. Conduct regression analysis using R
2. Develop proficiency in basic data management skills, including simple descriptive statistics to investigate data quality and creating analysis variables
3. Use RMarkdown to produce documents containing research results, including: graphical visualizations; tables of descriptive statistics and regression results; and in-text citations and APA formatted reference lists

# Course structure and how to succeed

## Course structure

Each week, the course will be structured around asynchronous (pre-class) lectures and one synchronous workshop-style class meeting per week. Weekly homework will consist of students working through the lectures on their own and a modest amount of required reading. Written homework will consist of four “problem sets.” Students will complete the first three problem sets in groups. Students will complete the final capstone problem set, due during finals week, on their own.

1. **Asynchronous (pre-class) lectures**. Weekly asynchronous lectures will be posted on the course website with the expectation that students work through the lecture in advance of our weekly synchronous class meeting. Lecture materials will consist of three types of resources: first, detailed lecture slides (PDF or HTML) introducing the statistical theory, programming skills, and sample code; second, short videos (e.g., 15 to 30 total minutes per week) that provide a high-level discussion of important and/or challenging concepts from the lecture slides, but not a line-by-line recitation of the lecture; and, third, the .Rmd file that created the PDF/html lecture slides. This .Rmd file will contain all “code chunks” and links to all data utilized in the lecture. Thus, students will be able to “learn by doing” in that they can run R code on their own computer while they work through lecture materials on their own.
2. **Synchronous workshop-style class meetings.** We will have one synchronous class meeting per week. Typically, these meetings will begin with a discussion of concepts students found difficult or confusing from the lecture materials. However, the bulk of class time will be devoted to students working in groups on a substantive question or challenge posed by the instructor. For example, students may be asked to create analysis variables from survey data in the presence of skip patterns or how we could improve on the analyses conducted in a research article students read prior to class. While students work in groups, the instructor and TA will visit with each group to answer questions and talk through ideas.

## How to succeed in this class

Prior to our in-class meetings, students should work through lecture materials on their own. We recommend treating the lecture materials as an active learning experience, in which students run *R* code on their computer instead of merely reading text on the slide. Additionally, we recommend that students ask questions on the course github website when they are having difficulty with the material.

With respect to written work, the problem sets – described below – will be substantive and are intended to be challenging. Students who devote time each week working through the lecture materials will be better prepared for the problem sets. We recommend starting the problem sets early. This way students will have plenty of time to ask for help on questions they find challenging.

# Creating an Inclusive Classroom Community

(Instructor, TA, and Community Expectations)

## Respect for diversity

# Course website and communication

## Course website

* Using github.

## Course discussion

* Use github issues/groups for all questions related to course content

## Communication with instructor and TA

* Email to instructor/TA for personal and sensitive issues

# Course materials

## Textbooks

TBA, but will chose one or two free books

## Other reading

Links to reading on course website

## Software

* [***R***](https://cloud.r-project.org/), statistical programming language
* [**RStudio**](https://rstudio.com/products/rstudio/download/), integrated development environment for R
* [**Git and GitHub**](https://github.com/Rucla-ed/rclass2/raw/master/_resources/todo/educ263_todo.pdf)

# Assignments and grading

## Assignments

### Problem sets

The primary course assessments are four problem sets, including the final capstone problem set. Each problem set will require students to apply knowledge of statistical concepts, conduct substantive statistical analyses, present and interpret results. Problem sets will also be designed to introduce students to some of the thorny data challenges that inevitably arise in real research projects. The final, capstone problem set will require students to conduct the major components of an empirical regression analysis, from research question and variable collection to modeling, presentation, and interpretation. Additionally, the capstone problem set will require students to critically evaluate an empirical journal article that utilized the same data sources to answer the same research question.

COMMENTS

* recommmendation on how challenging
  + make first problem set credit/no credit
  + make them short but challenging;
  + take time in class to work on the problem set
  + make the first couple of problem sets that have a lot of hints;
* think about how grades would be distributed throughout; you can’t give everyone an A;
* maybe giving students an opportunity to revise?
* Rashmita: Lucrecia’s example of “ED471-Project 3 - Spring 2019” problem set is problem set is

### Attendance and participation

## Grading scale

|  |  |
| --- | --- |
| Letter Grade | Percentage |
| A+ | 99-100% |
| A | 93-98.9% |
| A- | 90-92.9% |
| B+ | 87-89.9% |
| B | 83-86.9% |
| B- | 80-82.9% |
| C+ | 77-79.9% |
| C | 73-76.9% |
| C- | 70-72.9% |
| D | 60-69.9% |
| F | 0-59.9% |

# Course schedule

1. Introduction
2. Fundamentals of statistical inference I (sampling distributions and central limit theorem)
3. Fundamentals of statistical inference II (hypothesis testing)
4. Principles of causal inference: Rubin’s Causal Model and why experiments work
5. Introduction to bivariate regression
6. Prediction and measures of model fit
7. Hypothesis testing and confidence intervals for
8. Categorical X variables and introduction to multivariate regression
9. Using regression for causal inference: OLS assumptions and omitted variable bias
10. Creating tables and graphs of descriptive statistics and regression results

# Course policies

## Classroom environment

With respect to the course material, learning the essential skills of programming is hard! This stuff feels overwhelming to me all the time. So it is important that we all create an environment where students feel comfortable asking questions and talking about what they did not understand. Discomfort is part of the learning process. Unburdern yourself from the weight of being an “expert” and just focus on improving, helping your classmates improve, and helping your instructors improve.

With respect to classroom environment, let’s work together to create an environment that is relaxed, supportive, and where students feel comfortable voicing any concerns they have. Be mindful that words and body language affect people. Express your thoughts in a way that doesn’t make people feel excluded and does not make disparaging generalizations about any group. As an instructor, I am responsible for setting an example through my own conduct.

## Online Collaboration/Netiquette

You will communicate with instructors and peers virtually through a variety of tools such as GitHub, email, and web conferencing. The following guidelines will enable everyone in the course to participate and collaborate in a productive, safe environment.

* Be professional, courteous, and respectful as you would in a physical classroom.
* Online communication lacks the nonverbal cues that provide much of the meaning and nuances in face-to-face conversations. Choose your words carefully, phrase your sentences clearly, and stay on topic.
* It is expected that students may disagree with the research presented or the opinions of their fellow classmates. To disagree is fine but to disparage others’ views is unacceptable. All comments should be kept civil and thoughtful.

## Academic accomodations

Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE) at (310)825-1501 (located in Murphy Hall A255). When possible, students should contact the CAE within the first two weeks of the term as reasonable notice is needed to coordinate accommodations. For more information visit <https://www.cae.ucla.edu/>.

## Academic integrity

* UCLA policy
  + UCLA is a community of scholars. In this community, all members including faculty, staff and students alike are responsible for maintaining standards of academic honesty. As a student and member of the University community, you are here to get an education and are, therefore, expected to demonstrate integrity in your academic endeavors. You are evaluated on your own merits. Cheating, plagiarism, collaborative work, multiple submissions without the permission of the professor, or other kinds of academic dishonesty are considered unacceptable behavior and will result in formal disciplinary proceedings.
* This class
  + Given that 90% of course grade is based on weekly problem sets, the primary academic honesty concern that could come up in this class is copying problem set solutions from somebody else and passing this in as your own work.

# Campus resources

**Counseling**

This is a multidisciplinary student mental health center for the UCLA campus. CAPS offers an array of free services including individual counseling. If you suspect you are experiencing mental health problems or just need someone to talk to, you can make an appointment at John Wooden Center West, facing Drake Stadium, second floor, 310-825-0768. <http://www.counseling.ucla.edu>

**Discrimination**

UCLA is committed to maintaining a campus community that provides the stronget possible support for the intellectual and personal growth of all its members- students, faculty, and staff. Acts intended to create a hostile climate are unacceptable. To file an online incident report, visit: <https://equity.ucla.edu/report-an-incident/>

**Sexual harassment**

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, there are a variety of resources to assist you.

* CONFIDENTIAL RESOURCES:You can receive confidential support and advocacy at the CARE Advocacy Office for Sexual and Gender-Based Violence, A233 Murphy Hall, CAREadvocate@careprogram.ucla.edu, (310) 206-2465. Counseling and Psychological Services (CAPS) also provides confidential counseling to all students and can be reached 24/7 at (310) 825-0768.
* NON-CONFIDENTIAL RESOURCES: You can also report sexual violence or sexual harassment directly to the University’s Title IX Coordinator, 2255 Murphy Hall, titleix@conet.ucla.edu, (310) 206-3417. Reports to law enforcement can be made to UCPD at (310) 825-1491. These offices may be required to pursue an official investigation.

*Faculty and TAs are required under the UC Policy on Sexual Violence and Sexual Harassment to inform the Title IX Coordinator should they become aware that you or any other student has experienced sexual violence or sexual harassment.*

**LGBTQ resource center**

This resource center provides a range of education and advocacy services supporting intersectional identity development. It fosters unity; wellness; and an open, safe, inclusive environment for lesbian, gay, bisexual, intersex, transgender, queer, asexual, questioning, and same-gender-loving students, their families, and the entire campus community. Find it in the Student Activities Center, or via email lgbt@lgbt.ucla.edu. Visit their website for more information: <https://www.lgbt.ucla.edu/>

**International students**

The Dashew Center provides a range of programs to promote cross-cultural learning, language improvement, and cultural adjustment. Their programs include trips in the LA area, performances, and on-campus events and workshops. Visit their website for more information: <https://www.internationalcenter.ucla.edu/>

**Undocumented students**

This program provides a safe space for undergraduate and graduate undocument students. USP supports the UndocuBruin community through personalized services and resources, programs, and workshops. Visit their website for more information: <https://www.usp.ucla.edu/>

**Student legal services**

UCLA student legal services provides a range of legal support to all registered and enrolled UCLA students. Some of their services include:

* Landlord/Tenant Relations
* Accident and Injury Problems
* Domestic Violence and Harassment
* Divorces and Other Family Law Matter

For more information visit their website: <http://www.studentlegal.ucla.edu/index.php>

**Students with dependents**

UCLA Students with Dependents provides support to UCLA studens who are parents, guardians, and caregivers. Some of their services include:

* Information, referrals, and support to navigate UCLA (childcare, family housing, financial aid)
* Access to information about resources within the larger community
* On-site application and verification for CalFresh (food stamps) & MediCal and assistance with Cal Works/GAIN
* A quiet study space
* Family friendly graduation celebration in June

For more information visit their website: <https://www.swd.ucla.edu/>

**Lactation Rooms**

[Map to lactation rooms on campus](https://ucla.app.box.com/v/2019-lactation-map)

**Gender Inclusive restrooms**

[Map to gender inclusive restrooms](https://www.lgbt.ucla.edu/Portals/38/Documents/All-Gender%20Restroom%20Map_F15.pdf)

**Campus accessibility**

[Campus accessibility map](http://map.ucla.edu/downloads/pdf/Access_08_21_15.pdf)

## Center for accessible education

Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE). When possible, students should contact the CAE within the first two weeks of the term as reasonable notice is needed to coordinate accommodations. For more information visit www.cae.ucla.edu.

Located in A255 Murphy Hall: (310) 825-1501, TDD (310) 206-6083; <http://www.cae.ucla.edu/>

* Due to COVID-19, the CAE office is closed for in-person meetings.
* CAE counselor, resources, and services are still available via email / virtual appointment.
* Stay up-to-date with CAE newsletters & announcements at <https://www.cae.ucla.edu/announcements-events/student>

## Counseling and Psychological Services (CAPS)

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, depression, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. UC offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, consider utilizing the confidential mental health services available on campus.

Students in distress may speak directly with a counselor 24/7 at (310) 825-0768, or may call 911; located in Wooden Center West; www.caps.ucla.edu

* CAPS is open and has transitioned to Telehealth services ONLY.
* Open Mon – Thurs: 8 am-6 pm and Fri: 8 am-5 pm.
* As always, 24/7 crisis support is always available by phone at (310) 825-0768.

## Title IX Resources

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the CARE Advocacy Office for Sexual and Gender-Based Violence, located on the A-level of Murphy Hall (Room A233). More information is available here: <https://www.sexualviolence.ucla.edu/Get-Help>. In addition, Counseling and Psychological Services (CAPS) provides confidential counseling to all students and can be reached 24/7 at (310) 825-0768. You can also report sexual violence or sexual harassment directly to the University’s Title IX Coordinator, 2255 Murphy Hall, titleix@conet.ucla.edu, (310) 206-3417. Reports to law enforcement can be made to UCPD at (310) 825-1491.

## Undergraduate Writing Center

Peer learning facilitators (PLFs) are undergraduates who understand the challenges of writing at UCLA. Scheduled appointment and walk-in options are available, see www.wp.ucla.edu/uwc for more information about writing programs and to get assistance with your writing.

* Due to COVID-19, all physical UWC offices will be closed until further notice.
* All UWC appointments are now online via Zoom and Google Docs.
* Offer virtual drop-in appointments Mon – Thurs from 10am-9pm, Fri from 10am-3pm and Sun from 6-9pm.

For additional campus resources and student services, please review [this document](https://ucla.app.box.com/s/st51pify842ouoc24ae2r80s9sesavmy).