

ARE 106: Econometric Theory and Applications**Summer 2022****Instructor:** Tengda Gong, tdgong@ucdavis.edu**Office hours:** Thursday, 6:00-7:00 PM, on Zoom; Friday, 3:00-4:00 PM, SSH1160**Teaching Assistant:** Mengfei Zhou, mfzhou@ucdavis.edu**Office hours:** Monday & Tuesday, 4:00-5:00 PM, on Zoom

Class Website: [ARE 106 A01-A02 SS1 2022 \(ucdavis.edu\)](https://ucdavis.edu/are106/A01-A02/SS1/2022/). Visit this site regularly for handouts and announcements as well as others like Zoom links.

UCD Student resources: For answers to questions about academic support, health and wellness, career and internships, or campus community, please go to <https://ebeler.faculty.ucdavis.edu/resources/faq-student-resources/>

Prerequisites: ARE 100A, STA 103.

Course Objectives: You have all studied economic theory and statistics. This course brings together economic theory, mathematical tools, and statistics to do three things:

- (1) Estimate economic relationships, e.g., how does education relate to earnings?
- (2) Generalize from a sample of data to the whole population, e.g., how and to what extent does the relationship found in the sample represent the one in the population?
- (3) Test hypotheses about the relationship in the population, e.g., is education positively associated with earnings?

Lectures: MTW 12:10-1:50 PM in Olson Hall 6. Lectures will be recorded by lecture capture and recordings will NOT be available to you EXCEPT for reasonable excuses like Covid infection and others.

Computing: We will use R to implement what we learned using data. TA and I will teach you in detail.

TA discussions: Thursday 12:10-1:50 PM in Art 204 and 3:10 PM-4:50 PM on zoom. The former is in person and will NOT be recorded while the latter will be recorded and posted on Canvas.

Reading: The textbook is *Essentials of Applied Econometrics*, written by Aaron Smith and J. Edward Taylor. The book is available to UCD students for free online. Here's the link to the book:

<https://www.jstor.org/stable/10.1525/j.ctv1xxwfx>

You may need this link to install the UCD Library VPN client on your computer first:

<https://www.library.ucdavis.edu/service/connect-from-off-campus/>

Statistics Review: It is critical for this course that you remember and understand the statistics you learned in STA 103 (or equivalent). Now is a good time to review that material. There are also reviews of stats for econometrics available online. A couple of examples are:

<http://www.ssc.wisc.edu/~ctaber/410/statrev.pdf>

<http://www.dummies.com/how-to/content/statistics-for-dummies-cheat-sheet.html>

You should also review the statistics review problems under "Syllabus & Course Materials" on Canvas.

Assessment: There will be **four homework assignments, one midterm exam, and one final exam**. There are a total of 100 points available in this class. Your letter grade will be determined from your score out of 100. Here is how I will assign **weights** to each of these components.

<i>Short quizzes associated with lectures</i>	<u>20%</u>
due at midnight on each lecture day	
<i>Homework assignments</i>	
HW 1 due June 28 (Tuesday)	10%
HW 2 due July 5 (Tuesday)	10%
HW 3 due July 19 (Tuesday)	10%
HW 4 due July 26 (Tuesday)	10%
<i>HW total (smaller of sum of scores and 30%)</i>	<u>30%</u>
<i>Midterm (July 11, Monday, in class)</i>	<u>20%</u>
<i>Final (July 27, Wednesday, in class)</i>	<u>30%</u>
<i>Total</i>	<u>100%</u>

Multiple times during each lecture, I will post multiple choice quiz questions. The purpose of these quizzes is to check your understanding of the material in real time, which will help you process and retain it better. **I will show the quiz questions on the projector screen and you will answer them on Canvas. There will be 15 quizzes throughout the course (one for each lecture on average).** Each quiz is due at midnight on the lecture day (i.e., each Monday, Tuesday, and Wednesday at midnight). The easiest way to complete the quizzes is to do them in real time in class on your laptop or other devices like a cell phone. **Delayed answers will not be considered unless you have some reasonable arguments like Covid infections or others for extensions. I will grade each quiz out of 2 points and count your best 10 quiz scores towards your grade. This means you will get full credit on quizzes if you get a perfect score on at least 10 quizzes.**

Each homework requires two submissions: answer questions and submit R scripts with comments on Canvas. Each homework is worth up to 10% of your grade, but you cannot score more than 30% on homework. For example, this means **you would get full credit on homework if you got 75% of scores on each assignment or if you got 100% of scores on three of the assignments and skip the other one.**

If your final exam score exceeds your midterm score, I will weight your final 50% and your midterm zero. This policy allows you to make up for a bad midterm by doing well on the final. Here is the formula for your final score:

$$\text{Final Score} = [(\text{top 10 QUIZ scores}/20)*100]*20\% + [\min(30, \text{HW1} + \text{HW2} + \text{HW3} + \text{HW4})/30*100]*30\% + \max(\text{MIDTERM}, \text{FINAL})*20\% + \text{FINAL}*30\%$$

I do not curve grades down. This means that, if you score above 90, you are guaranteed at least an A-, if you score above 80, you are guaranteed at least a B-, and if you score above 70, you are guaranteed at least a C-. The average grade in this and all ARE classes is about a B-.