Department of Economics
University of California, Berkeley
Last updated: 7/19/22

Fall 2022
ECON 140
Prof. Ryan D. Edwards

# ECON 140 — ECONOMETRICS
⇒ Subject to revisions. We will announce any key changes ⇐

| | |
|---|---|
| Begin/End | Instruction: Aug 25, 2022 through Dec 2, 2022 |
| Requirements | <ul><li>A handful of problem sets (5 or fewer)</li><li>1 brief empirical term project</li><li>1 midterm exam</li><li>1 final exam</li><li>Participation via Poll Everywhere</li></ul> |
| >>> Please consult the COURSE CALENDAR and COURSE FAQ <<< | |
| Meetings | <ul><li>Tuesdays and Thursdays 9:40 – 11:00 AM</li></ul> |
| Fall 2022 mode | **In person.** Please read the box below.<br>Our credo: Just make it work. We trust you. We're in this together. |
| Websites | bCourses<br>Ed Discussions (accessible through bCourses)<br>Google Drive folder |
| Classes entries | ECON 140 |
| Readings | Primary textbook: Joshua Angrist and Jörn-Steffen Pischke, *Mastering 'Metrics*. Princeton: Princeton University Press, 2015.<br>For scheduling and other occasional readings, see the course calendar<br>Please configure your browser to use the library proxy |

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**FALL 2022 GAME PLAN**

In the summer of 2022, Omicron variants raised infections and hospitalizations nationwide. In the fall, campus policy is to conduct in-person instruction with policies like suggested masking.

The Academic Senate has approved ECON 140 as an in-person course. **Instructors and students should expect to attend the course and conduct it in-person.**

I am a veteran of both in-person and distance modes, synchronous and asynchronous. We will beam the main class live via Zoom to remote participants. **But section leaders are not required to accommodate distance learning.** Please keep in mind that the GSIs are students just like you.

I trust you all to make the best decisions for your health and well-being. **If you're sick, you should stay home**. My advice is to **wear a mask** when Covid is raging, like you would bring an umbrella if it's pouring rain. We will find a way for you to participate and complete requirements, whether physically near or far. We will use Poll Everywhere, which is a classroom response system designed for this. Please keep in mind that COVID-19 or other hazards like smoke might quickly shift our learning mode.

**Sections of the syllabus:**

**Instructional personnel:**

Ryan D. Edwards
Lecturer, Economics & Demography
ryanedw@berkeley.edu

Zoom: Office hours scheduled on Calendly
Day/time TBD 15 minute increments on Zoom
Physical: Tue 1-3, Thu 2-3 in Evans Hall 585

Brendan Foo
Graduate Student Instructor
bfoo@berkeley.edu

Tuesday 2-4pm on Zoom
Zoom link: https://berkeley.zoom.us/j/5335467116

Gautham Koorma
Graduate Student Instructor
gautham.koorma@berkeley.edu

Mondays 2-4pm on Zoom
Zoom link:
https://berkeley.zoom.us/j/4804566518?pwd=L2JhQ1cxN3YvUT
BaODJlN3FwTWJSUT09

Tzu Leung
Graduate Student Instructor
tzuleung@berkeley.edu

Thursday 4-6pm on Zoom
Zoom link: https://berkeley.zoom.us/my/tzuleung

Runjiu Liu
Graduate Student Instructor
runjiu_liu@berkeley.edu

Thursdays 2-4 pm. on Zoom
Zoom link: https://berkeley.zoom.us/j/95819537144

Jonathan Old
Graduate Student Instructor
jonathan_old@berkeley.edu

Wednesdays 4-6 pm, on Zoom.
Zoom link:
https://berkeley.zoom.us/j/94337874742?pwd=UFZYTTZHcytlTX
pBOSsvTU1yclZtQT09

Daniela Paz Cruzat
Lead Graduate Student Instructor
daniela_paz@berkeley.edu

Fridays 9-11 a.m. on Zoom
Zoom link: https://berkeley.zoom.us/my/danielapaz

Lucio Wasserman
Graduate Student Instructor
luciowasserman@berkeley.edu

Wednesdays 8-10 a.m. on Zoom
Zoom link: https://berkeley.zoom.us/j/99022754712

Adrian Wilson
Graduate Student Instructor
adrian.wilson@berkeley.edu

Fridays 10–12 am on Zoom
Zoom link: https://berkeley.zoom.us/j/94161642897

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**OVERVIEW:**

This course covers the basic statistical techniques that economists use for estimating and testing economic relationships in modern empirical research. There are many applications of these methods, but we motivate our approach first by focusing on treatment and outcome variables in the setting of a randomized trial. Thus our focus is on causal analysis of real-world data.

This version of ECON 140 is focused on answering real-world questions about economic policies and human behavior. The course develops your intuition about how to apply econometric techniques, and it trains you to obtain and clean real data, to apply econometric techniques effectively, and to interpret your results and explain them in writing.

Successful completion of this course will allow you to read and understand much of the academic literature in empirical economics, and to start independent research using economic data, for example in upper division ECON courses at Berkeley.

**UNDERGRADUATE LEARNING GOALS:**

As part of Berkeley's Undergraduate Student Learning Initiative (USLI), the Economics Department has developed **learning goals** for the Economics major.

The specific learning goals for ECON 140 include:

CT4: Role of assumptions
QT1: Understand the role of empirical evidence in evaluating economic problems
QT2: Interpret results
QT3: Conduct statistical analysis
QT4: Gather or obtain research data

**TEXTBOOKS AND PROGRAMMING:**

**Main:**
Joshua Angrist and Jörn-Steffen Pischke (2015) *Mastering 'Metrics*. Princeton: Princeton University Press. Denoted "AP" in the course calendar.

ECON 140 will closely follow the pedagogy in the AP textbook, which emphasizes intuition over formal math. *There is no statistical code in this book per se,* although there is STATA code in accompanying online materials at https://www.masteringmetrics.com/

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**Other readings:**
We may also consult academic papers, with links posted to the article on JSTOR for example. Please configure your browser to use the library proxy if you are connecting from off campus.

**Supplemental:**
- Florian Heiss, *Using R for Introductory Econometrics*, 2nd edition ISBN: 979-8648424364
- Florian Heiss and Daniel Brunner, *Using Python for Introductory Econometrics*, ISBN: 979-8648436763
- Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach 7e* ISBN: 9780357693223

Wooldridge is a good but dense textbook written with accompanying STATA code. As Heiss describes, the 5th, 6th, and 7th editions are similar. The two textbooks with R and Python code by Heiss and Brunner are available in free online HTML5 and in other (paid) formats. They follow Wooldridge's structure and use his datasets.

You may find that "hands-on" textbooks with code, like these supplemental texts, serve as better references than MM for getting your work and projects done. But they may also not provide as much guidance about what to do and why to do it when the time comes for you to develop your own projects.

**Programming language:**
In class, I will use a combination of R or Python and some STATA. I have 30 years of experience working with STATA, and I use it in my research. Across upper-division electives at Berkeley, you are likely to see all three of these languages. Here is a language comparison grid:

|  | **Python** | **R** | **STATA** |
|---|---|---|---|
| Price | free | free | $$ unless you use the Citrix server |
| User base | Machine learning, artificial intelligence, Compsci, Datasci | Statistics, social science, MCELLBI, etc. | Economics, sociology, etc. |
| Accessible on datahub | datahub.berkeley.edu | r.datahub.berkeley.edu | No. Use Citrix or a local copy |
| Install and run a local copy? | Hard | Hard | Easy |

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To paraphrase [Heiss](#):
- Most data analysis and econometrics tasks can be performed equally well across these
- Choose one and get accustomed to it. Do NOT rely on a spreadsheet program

**Datahub.**
I strongly recommend that you choose either R or Python and that you complete your work for ECON 140 using datahub. Datahub is a masterfully designed server that is accessible to everyone with a bCourses account ([your_username@berkeley.edu](mailto:your_username@berkeley.edu)). It comes fully configured for you to complete most tasks. The biggest challenge that arises is that student accounts are typically limited to 1 GB of memory. If you try to analyze a large dataset on datahub, you might encounter difficulties.

**CONCURRENT ENROLLMENT:**
Students can expect their concurrent enrollment applications to be approved or denied within the first few weeks of classes.

**PREREQUISITES:**

The formal prerequisites [on the books](#) are:
- ECON 1 or 2 or equivalent
- Stats 20, 21, W21, 88, 131A, or 135 or equivalent

Students who have completed Data 8 and a connector course like Stat 88 or Data 88 (or others) may also be prepared to take ECON 140.

**REQUIREMENTS:**

|  |  |
|---|---|
| ○ Plagiarism quiz online on bCourses | 1% |
| ○ Class participation via answering Poll Everywhere polls | 4% |
| ○ Problem Sets | 20% |
| ○ 1 Short empirical project & writeup | 20% |
| ○ Midterm exam | 25% |
| ○ Final exam | 29.5% |
| ○ Complete the course evaluation | 0.5% |

Due dates are shown in the [course calendar](#).

**Participation** is defined as answering at least one poll during each live class session when we are conducting polls. Answers do not need to be "correct" to count and often will not be of that

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nature. We will use the flexible *Poll Everywhere* environment, which is designed for hybrid classrooms and allows responses by web browser, smartphone, and even by SMS.

We will aim to start measuring classroom participation in the second week of classes, and we will grant two unexcused absences over the remaining 25 or so meetings that will have participation credit available. Excused absences due to illness, sports or other related travel, family care, and other reasons do not count against your two unexcused absences.

**Problem Sets** are designed to walk students through rudimentary programming with data analysis.

Students without experience programming may wish to reach out to the instructor, GSIs, and to fellow students for more support.

**A note here on academic honesty and the honor code**, with more below under Academic Integrity:

- Copying code is generally a way that we learn
- Copying answers is not

Use collaboration effectively, to learn. Copy code, but adapt it to your needs. Use it for analysis, and write up your analysis in your own words. Abide by the Berkeley Honor Code at all times (see below).

We expect the assignments will take 3 to 6 hours per week, depending on the student. They must be submitted to the course's Gradescope page and will be graded with 0, 1, or 2 points per discrete answer:

| 2 points | 1 point | 0 points |
| --- | --- | --- |
| Correct answer is given | An answer is given but it is incorrect | No answer is given |

We will **drop your lowest grade** on the Problem Sets when calculating your overall course grade.

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**Exams** will occur at midterm and during the final exam time block, with added flexibility if circumstances warrant them. For the timing of each, see the course calendar.

**LATE POLICY:**
- DSP students receive full accommodation. Please see below.

- Others with extenuating circumstances such as medical or family emergencies will not be penalized for late submissions *if they contact Prof. Edwards in advance via email*

- Assignments submitted after their deadlines will be penalized 25% for each 24 period:
  - Late[†] by 1-24 hours:            25% penalty
  - Late after 24 but before 48 hours:   50% penalty
  - Late after 48 but before 72 hours:   75% penalty
  - Late after 72 hours:              100% penalty

[†] Late by < 1 hour is not considered late. If your computer burps, etc., that's fine. More than that? Get in touch.

**SICK POLICY**

It is important to take care of yourself and others. If you are sick, stay home. Email the instructor beforehand if your illness will interfere with completing assignments.

If you are sick on the day of a scheduled in-class exam, stay home. Provided that the instruction mode remains in-person, our tentative plan is to construct exams so that part of each will be completed online by all students. If you are sick and unable to attend the in-person component, we will add its grade weight to that of the online component. Without special accommodation from the instructor, students will need to complete at *least one in-person exam* component during the term. Students cannot miss both in-person exams.

**GRADING POLICIES:**

ECON 140 is a large class that is required in the major sequence. Course grades will be calculated based on points earned in the assignments according to these objectives:

- **Fairness.** Students receive the grade they earned. Hard work is rewarded.
- **Consistency.** All students earn grades in the same way, with the same rules.
- **Measurement.** More demonstrated learning and work excellence earn better grades.

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ECON 140 is one of the required upper-division courses in the major sequence, and honors in economics is determined by grade-point average cutoffs. The aim in ECON 140 is to award an average and median overall course grade of a B (= 3.0), with variance around the mode. To achieve that particular goal, we will make advanced parts of assignments difficult, and we will curve the grades.

Students may have in mind the standard percentage thresholds for grades (0-59% = F; 60-69% = D; 70-79% = C; 80-89% = B; 90-100% = A), known as the "straight percentage" grade. This is what bCourses usually reports to students.

We will design the assignments to include difficult components, so that students' straight percentage scores will typically imply a lower grade than that awarded by the curve. For example, if a student has earned 86 percent of the course credit, we anticipate that student may earn an overall course grade of A-minus — rather than the grade of B implied by the straight percentage — if as anticipated that places the student around the 70th percentile of scores in the class.

**Plagiarism** and other academic dishonesty on an assignment will earn a zero on that assignment, regardless of the precise extent of the plagiarism or dishonesty. More details appear below under Academic Integrity.

Do you have more questions? Are you wondering about percentile cutoffs? Check the Grading Schemes document on Drive, which lays out the example above in the rightmost columns.

**"Curve breaking."** We take academic dishonesty very seriously. Sometimes students have expressed the concern that with a grading curve, cheating by other students impacts their own grade by "breaking the curve."

Please take these points to heart:
● I have over 16 years of experience teaching college and graduate students
● I have busted about 16 students for cheating, about 1 each year
● I just busted a student for cheating in Spring 2022. Another in Summer C 2022
● I will keep your grade safe from "curve breaking"
● You should focus on learning and using these new skills. Leave the grading to me
● When I assign overall course grades, I look at every single score by every student

**bCourses** Grades by default should tell you a decent forecast of your ultimate "straight percentage" grade, if you have the "Calculate based only on graded assignment" option checked. When you have that option checked, bCourses omits any assignments that are not yet graded from the numerator and the denominator. If scores on your ungraded future work are

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better/similar/lower compared to your past scores, you will earn a better/similar/lower final "straight percentage" grade.

All course requirements earn you points.

**GRADING REDEMPTION:**
Students who bomb some early requirements but who are able to improve their performance may receive a reweighting that favors later course requirements. Grades should reward effort in addition to signaling the attainment of learning objectives.

(Students who do well early but bomb late requirements should not expect to receive similar protection in reverse, unless they can cite a medical or other reason for the situation.)

**SCHEDULE:**
Please consult the class calendar for specifics. For enrollment change deadlines, please consult the UC Berkeley Registrar.

**STATEMENT ON ACCOMMODATION:**
Students with disabilities and other special needs will be fully accommodated. UC Berkeley's Disabled Students Program (DSP) is the group to approach initially for such needs.

Please email the instructor if special needs may impact completion of course requirements.

Please carefully read the class calendar. If you need to request an alternative due date or other accommodation pertaining to your religious creed, your extracurricular schedule, illnesses, disabilities, pregnancy or parenting, please submit a request directly to the instructor by the end of the second week of the term or when the condition develops. In general, please notify the instructor in writing (email) about these issues and, if you can, please suggest a solution.

**EVALUATION OF STUDENT PERFORMANCE:**
Any multiple-choice quizzes will be graded with a single, uniform, and transparent standard.

Problem sets and exams will be graded on a points system with partial credit possible. GSI's may collaborate by grading these in separate sections. **Regrade requests** can be submitted up to a week after grading for the deliverable is done and released to students. Instructional staff will check the entire deliverable (problem set or exam) for accuracy and consistency in grading. The final score could go up or down depending on what is found.

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**STUDENTS' AND INSTRUCTORS' RIGHTS:**
Students and instructors are expected to respect the rights of others to express their points of view. Some course materials may be copyrighted and should not be publicly distributed.

**SAFETY AND EMERGENCY PREPAREDNESS:**

I recommend that all students sign up for UC Berkeley WarnMe. For details, see the Office of Emergency Management.

Sirens at noon on first Wednesdays are tests. Sirens any other time mean shelter in place. In Spring 2022, a campus shelter-in-place occurred on April 21, 2022. On March 14, 2022, a water main ruptured at the Haas School of Business.

Take a moment and think about what you will do in the event of an emergency. OEM provides a checklist here that you can fill out when thinking about this.

**ACADEMIC INTEGRITY:**
Integrity, honor, and honesty must be maintained at all times. Students will affirm the UC Berkeley Honor Code on assignments.

**UC Berkeley Honor Code**

> "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others."

Students are expected to adhere to the honor code at all times, and they will be requested to rewrite the honor code on assignments they submit. Questions? Please consult the CTL Honor Code page and ask the instructor.

If you are uncertain about what *plagiarism* is, please consult with the instructor. A good rule of thumb is: if you can explain a concept in your own words, then you need to do it, rather than copy the concept verbatim. If you cannot explain it, then you need to spend time learning it or asking for help. You must answer questions using your own words to describe concepts and results as you understand them. It is not acceptable to copy answers, perhaps changing a few words using a thesaurus, and submit it as your own work. That is plagiarism.

If the instructional staff identify cases of academic dishonesty by students in ECON 140, which include but are not limited to copying and plagiarizing, those students will face the full consequences of their actions.

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**Penalties for Plagiarism**

An assignment that is partially or completely plagiarized will receive a **zero**. All plagiarism events will be reported to administration according to the steps outlined by the Center for Student Conduct.

As noted above, we may use the **Turnitin** plagiarism detection software linked to bCourses, if for example we run a take-home midterm. In its default configuration, it should share a report with you immediately after you submit. As you may know, Turnitin reports are useful but far from perfect, and we are aware of this and do not jump to unwarranted conclusions.

For further information, students may wish to examine materials from the Center for Student Conduct, in particular this page of definitions.

International students may wish to consult the Academic Integrity page of the International Office for details if they are unfamiliar with plagiarism and academic integrity.

**DISCLAIMER:**
This syllabus is subject to change. Please check back during the term for updates.

**FAQ:**
See the FAQ document in this directory

Here's a separate R coding FAQ document in this directory

# Reading List

See the course calendar