

Experimental Design
ECON 11600-01 and ECON 11600-02

Lectures: Lectures take place on Mondays and Wednesdays, between 1:30pm and 2:50pm (section 01) and 3:00pm and 4:20pm (section 02) in Saieh Hall 203. Lectures are taught in person. You are expected to attend. Please attend the lecture for the section you enrolled in.

Office hours: Monday 10:00am-11:30am (in person-Saieh Hall 313A), Thursdays 10:00am-11:30am (on zoom, not recorded), or by appointment (fulya@uchicago.edu).

TA: Ashton Pallottini (ashtonp@uchicago.edu)

- Discussion sessions: You are expected to participate in all discussion sections and are responsible from the material covered or information shared in the discussion sections. Discussion sections will take place on Fridays 1:30pm-2:20pm (section 01) and Tuesdays 4:30pm-5:20pm (section 02). If you need to switch discussion sections, please let me know. If you cannot make it to either of the discussion sections, consider dropping the course.
- Office hours: Your TA will hold two hours of office hours on Thursdays 12:00pm-2:00 pm. These office hours will be in person. Location will be announced.

Course Description: This course equips students with the necessary skills to design and execute experiments effectively. In the first part of the course, students will learn why experiments are conducted and explore different types of experiments along with their respective advantages and disadvantages. Students will gain insights into choosing appropriate incentive structures and appropriate sample sizes. The course addresses critical issues, including internal and external validity, scalability concerns, and the risks of P-hacking and multiple hypothesis testing. Students will also learn about Institutional Review Board procedures. In the second part of the course, students will learn how to measure various constructs such as subjective expectations, competitiveness, and discrimination and various preferences such as time preferences, risk preferences, and other-regarding preferences.

Prerequisite: ECON10000/20000/20010 and STAT22000/STAT23400/STAT24400/ECON11010

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Compare and contrast different types of experiments.
- Construct the appropriate hypothesis tests.
- Determine appropriate sample sizes and evaluate statistical power in experimental designs.
- Evaluate the internal and external validity of experimental results.
- Demonstrate familiarity with Institutional Review Board procedures.
- Compare and contrast different measurement techniques.
- Create a robust experimental design to answer a question of interest.

Textbooks:

I refer to the materials from the books below. Hence, they are recommended, but not compulsory:

Gerber and Green, 2012; Field Experiments: Design, Analysis, and Interpretation

Glennerster and Takavarasha, 2013; Running Randomized Evaluations: A Practical Guide

Holt, 2019; Markets, Games, and Strategic Behavior: An Introduction to Experimental Economics.

Discussion Board Usage:

We will use **Ed discussion board** which you can reach through canvas. Please post all your questions on the discussion board.

Assessments

Problem sets (20% of your course grade): There will be four problems sets. Problem sets can be downloaded from Canvas. You should upload your answers to Gradescope. If you email them to the TA or me, it is NOT considered submitted. A “how-to-submit” video and guide is available: https://www.gradescope.com/get_started#student-submission. You are encouraged to work in groups (at most 3 please), but you must submit individual answers. If you work with a group, indicate the names of other group members. I expect answers to be similar but not identical.

Policy on Late Problem Sets: Late submissions will be accepted with a 10% penalty per day (at most 3 days). If you submit it after 3 days but before the final day of classes, you can get at most half of the points.

Don't wait until the last minute to upload your problem sets to Gradescope as you might encounter some technical difficulties. Technical difficulties do not count as exceptional circumstances. Examples of technical difficulties include but are not limited to being unable to reduce the file size sufficiently, not knowing how to submit assignments, forgetting to upload a file, uploading the wrong file, uploading a file that is illegible, internet going down, etc. The teaching team cannot help you with technical difficulties, but canvas and Gradescope has help and contact sections.

Midterm Exam (40% of the grade): There will be one exam in this class. You will take this exam individually.

Policy on Missed Exam: If you will need to miss an exam due to a medical reason or university-sanctioned event, you need to communicate with the instructor before the exam.

Research Project (40% of your grade): Over the course of the class, you will work in groups to develop a proposal for an experiment to be run in an organization of your choice (you will not actually run the experiment). You will write a proposal and you will make a presentation, pitching your idea. More details about the research project will be shared during the first discussion section.

Special Exam Accommodations. Some of you may have approved exam accommodations through Student Disabilities Services. If you are in this category, you **must** provide me your documentation letter from the appropriate university authority **and** contact Student Disabilities Services to schedule your exam *at least a week before the exam*. Failure to do so may compromise the University's ability to provide reasonable accommodations.

Pass/Fail Grading and Withdrawal

Pass/Fail Grading: You have until before the start of your final exam to exercise the options to take the course as Pass/Fail qualitative grade, using the form on the final exam cover sheet or email the instructor in advance. Once your final exam has started, this option expires.

Caution: "Pass" is a non-quality grade, which does not count towards the economics major. You are strongly encouraged to extensively discuss with the instructor and your College Adviser before choosing the Pass/Fail grading option. Before exercising the option for Pass/Fail grading, please speak with your College Adviser, and the Undergraduate Student Affairs Administrator, Julie Wong, to fully understand the ramifications of your choice of Pass/Fail grading.

Course Withdrawal: You may request for Withdrawal with W recorded on your transcript by speaking to your academic advisor and finishing the requests with the Registrar before 5:00pm on the Monday of the 9th Week of the quarter. Per College regulations, you cannot request for Withdrawal by emailing the instructor.

Incomplete Request: Should extenuating circumstance or emergency warrants and in consultation with your College Adviser, you may request for Incomplete to fulfill the requirements at the latter date according to the agreement as noted on the Incomplete form. Per College regulations, to be eligible for Incomplete request, you must have (1) regularly attended the classes, and (2) completed significant (50% or more) portion of the assignments and evaluations items at the passing quality.

Policy on Religious Accommodation: Students must inform their instructors **in writing** of their need to observe a religious holiday reasonably well in advance of the absence, preferably at the beginning of the quarter. See <https://studentmanual.uchicago.edu/university-policies/policy-on-religious-accommodation-for-missed-classes-assignments-and-exams/> for the university policy on religious accommodation.

Technology: The course has a **Canvas** website. We will use Canvas for announcements, assignments, and other course related materials. We will use **Gradescope** for assignment submission. We will use **Ed Discussion Board** for your questions. Thursday office hours will be conducted over **Zoom**. I will communicate urgent messages **through your school email**, so please check it regularly.

I might use **Stata** occasionally in this course. IT Services has three computer labs and vLab that have Stata accessible within the lab and remotely. For more on how to connect to the remote application service click on academictech.uchicago.edu/vlab.

AI tools:

In this course, we will be developing skills and knowledge that are important to discover and practice on your own. Because of this, you are NOT allowed to use any AI tools, such as ChatGPT or Dall- E 2, for problem sets.

The use of AI tools, such as ChatGPT or Dall-E 2, is allowed for the research project. You are not required to use AI tools, but if you choose to use them for any part of the assignment (from brainstorming to text editing), you must use proper citation (please use [APA citation format](#)) and explain for which parts of the research project you have utilized the AI tools. Failure to properly cite AI tools is considered a violation of the University of Chicago's Academic Honesty and Plagiarism policy. If you are unclear if something is an AI Tool, please check with me.

Academic Integrity and Honesty Statement: As a University of Chicago student, you have agreed to abide by the University's academic honesty policy. All academic work must meet the standards described in Academic Integrity & Student Conduct found at: <https://college.uchicago.edu/advising/academic-integrity-student-conduct>, as well as in the Student Manual of University Policies & Regulations.

You must complete all the work using materials or resources explicitly allowed. Work from others, if used, or others' contribution to the work must be properly cited or referred according to the University standard. You are hereby cautioned that any plagiarism and cheating incidents of any evaluation will be reported to the College. The use of answers of current peers and/or solutions from previous quarters, partially or wholly, to complete the problem sets is considered plagiarism as you have not completed the work by yourself.

Title IX Statement: Faculty members, instructors, and TAs are designated as "Individuals with Title IX Reporting Responsibilities," which are required to report all incidents of sexual misconduct (including sexual harassment), dating violence, domestic violence, and stalking to the Title IX Coordinator for the University. For more information, see <https://harassmentpolicy.uchicago.edu/>.

Statement of Diversity and Inclusion: The University of Chicago is committed to diversity and rigorous inquiry that arises from multiple perspectives. I concur with this commitment and also believe that we have the highest quality interactions and can creatively solve more problems when we recognize and share our diversity. I thus expect to maintain a productive learning environment based on open communication, mutual respect, and non-discrimination. I view the diversity that students bring to this class as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, generational status, socioeconomic status, ethnicity, race, religious background, and immigration status. Please correct me on your preferred names or gender pronouns.

Campus Resources: Campus resources available to support you and ensure your successful learning experiences.

- If you have any concerns regarding physical or mental health, please speak with the Student Health Service (773-702-4156 or <https://wellness.uchicago.edu/>) or Student Counseling Service (773-702-9800) right away.
- If you have emergency concerns related to referrals, advice, information, and support, please speak with the 24/7 Dean-on-Call (773-834-HELP) right away.
- If you believe that you need additional classroom resources and accommodations, or exam facilities, please speak with the Student Disability Services (773-702-6000 or <https://disabilities.uchicago.edu/>) so that arrangements can be made in a timely fashion.
- The College Core Tutor Program is available in Harper Memorial Library. The tutors are experienced and select undergraduate students who can also provide guidance outside of classroom. See <http://core-tutors.uchicago.edu/> for more information.
- Should you have any questions regarding curricular planning of economics major, please speak with me during the Drop-In Advising Hours, or the Undergraduate Student Affairs Administrator, Julie Wong at juliew@uchicago.edu.
- Along with members of the Undergraduate team, I offer Drop-In Advising Hours to answer any questions regarding your research interests, career choices, and curricular planning.

Tentative Schedule (Subject to Change)

Weeks	Topics	Materials	Assignments
Week 1 (1/3)	Introduction	Gerber and Green, Ch. 1	
Week 2 (1/8 and 1/10)	Why randomize? Formal Model of Causal Inference	Gerber and Green, Ch.2, Glennerster and Takavarasha Ch.2	Research Groups Formation Due 1/12 5pm
Week 3 (1/17)	How to randomize?	Glennerster and Takavarasha Ch.4	Problem Set 1 Due 1/18 5pm Research Questions Due 1/19 5pm
Week 4 (1/22 and 1/24)	Hypothesis Testing, Sample Size, and Statistical Power	Gerber and Green, Ch.3, Glennerster and Takavarasha Ch.6	
Week 5 (1/29 and 1/31)	Guest Lecture (IRB-ethical concerns) Internal Validity	Gerber and Green, Ch.7, Glennerster and Takavarasha, Ch.7	Problem Set 2 Due 2/1 5pm
Week 6 (2/5 and 2/7)	External Validity Eliciting risk preferences	Gerber and Green, Ch.7, Glennerster and Takavarasha, Ch.7 Holt Ch.3	Consent Forms Due 2/9 5pm
Week 7 (2/12 and 2/14)	Eliciting time preferences	Cohen et. al., JEL, 2020*	Problem Set 3 Due 2/12 5pm Midterm Exam On 2/14 during class time
Week 8 (2/19 and 2/21)	Eliciting social preferences Eliciting beliefs	Holt Ch.15 Holt Ch.6	
Week 9 (2/26 and 2/28)	Research Presentations during class time		Research Presentations during class time Problem Set 4 Due 2/29 5pm
Week 10 (3/5 to 3/8)	Finals Week		Research Reports Due 3/6 5pm

*will be posted on Canvas