ECON 502: Economic Statistics
Fall 2026

Course Information

- Class Hours: TTR 11:00AM – 12:20PM
- Location: 302 Architecture Building
- Weekly Hours of Expected Student Work, apart from instruction time: Approximately 9 hours per week for lectures and readings; an additional 5-10 hours with assignment or exams
- Credit Hours: 4 Credit Hours

Instructor Information

EunYi Chung

Department of Economics, College of Liberal Arts and Sciences, University of Illinois Urbana-Champaign

- Contact information: eunyi@illinois.edu
- Office location: DKH 210
- Office Hours:
  - T 9:30 – 10:30 AM (Sign-up via Canvas required) | or by appointment
- Website: http://canvas.illinois.edu (all course materials and announcements)

Email Communication

When emailing the instructor about the course, please include **[Econ502]** in the subject line. This will help ensure that your email is identified and addressed promptly. The instructor will make every effort to respond to course-related emails within 24 hours**.**

Teaching Assistant

Lovepreet Singh

- Contact information: ls12@illinois.edu
- TA Discussion Session: Fridays 11:00AM – 12:20PM 123 DKH
- Office location: TBD
- Office Hours: MTWTR 10:00AM – 11:00AM

Course Description

This is a master's-level statistics course covering key topics such as descriptive statistics, probability theory, statistical inference, and an introduction to regression analysis. The goal of the course is to equip students with the foundational knowledge needed to succeed in more advanced econometrics and applied economics courses. The course is structured in three parts. The first focuses on descriptive statistics, probability theory, and univariate random variable models. The second explores multivariate distributions, expectations, and sampling distributions. The third addresses statistical inference, including estimation, confidence intervals, and hypothesis testing, along with an introduction to linear regression. Students are expected to have a working knowledge of algebra and calculus.

Learning Outcomes

In this course, students will:

- Summarize the interpret data using appropriate descriptive statistics and graphical methods.
- Apply fundamental concepts of probability.
- Analyze probability models and understand relationships among multiple random variables.
- Understand and apply sampling distributions and key asymptotic concepts that provide the foundation for statistical inference.
- Apply statistical methods to economic problems and critically interpret statistical results in an applied economics context.
- Develop the statistical foundation necessary for advanced coursework in econometrics, causal inference, and applied economics.

Course Materials

Learning Management System (LMS)

Canvas (http://canvas.illinois.edu) is the Learning Management System for this course. Lecture slides, supplemental readings, problem sets, announcements, and grades are all posted on Canvas. Assignment submissions are made through Canvas.

Course Readings

There are two main textbooks for this course:

Rice, J. A. (2007), Mathematical Statistics and Data Analysis, 3rd edition, Cengage.

Diez, D., M. Çetinkaya-Rundel and C. Barr (2019), OpenIntro Statistics, 4th edition, available free at openintro.org/book/os.

Software

R (http://ftp.ussg.iu.edu/CRAN/) and RStudio (https://rstudio.com) are required for all empirical assignments; problem set solutions are provided in R. Students may use other statistical packages but R solutions will be the reference. The use of R will be introduced in the discussion sessions, but an intense practice by oneself is the best way to become proficient. Zoom may be used for online office hours.

Course Requirements and Policies

Grading Breakdown

The table below shows the breakdown of course points. Your final grade is calculated as (total points earned / 1,000) × 100.

Instructional Activity	Occurrences	Point Value	Total Points
Problem Sets	10 (tentative)	30 pts each	300
Midterm Exam	1	300 pts	300
Final Exam	1	400 pts	400
Attendance and participation		Extra Credit	Extra Credit
Total	N/A	N/A	1,000

Course Components

The following describes each major component of the course grade. Full rubrics and submission instructions for each component are available on Canvas.

Assignments

There will be (almost every) weekly problem sets throughout the semester. The problem sets will consist of a mix of theoretical questions and empirical (coding) exercises. Submit via Canvas. Late submissions will not be accepted, and missed assignments will receive a score of zero. Working with classmates is encouraged; however, each student must submit your own work.

Exams

There are one midterm and a cumulative final exam Exams will be based on problems similar to those assigned during the course:

Midterm Exam (300 points). Thursday October 15th in class. No make-up exams except documented emergencies.

Final Exam (400 points). Friday December 11th 8:00AM-11:00AM. No make-up exams except documented emergencies.

Late Assignment Policy

Late submissions are not accepted. Problem set deadlines are firm; Canvas will not accept submissions after the deadline on the due date. If you anticipate difficulty, contact the instructor as early as possible. Exams cannot be rescheduled except in documented emergencies (see Absence Policy).

Class Attendance

Students who attend lectures regularly (no more than two excused or unexcused absences – no explanation necessary) and participate actively in class will have the opportunity to earn extra credit at the end of the semester. This policy is designed to recognize and reward those who make consistent, diligent efforts to be present and engaged, thereby contributing to a positive and productive learning environment. Extra credit will be applied to the final course grade and may make a difference in border line cases.

Absence Policy

Per the Student Code (https://studentcode.illinois.edu/article1/part5/1-501/), the authority to excuse absences rests with the instructor. Make-up exams are not permitted except in rare documented emergencies: prolonged illness or injury (3+ days), life-threatening illness or injury, death of an immediate family member, or a religious observance. To request accommodation, contact the Dean of Students Office (https://odos.illinois.edu/) immediately with supporting documentation. Minor illnesses and notes from McKinley or CampusTown Urgent Care are not accepted.

Final Letter Grades

Final grades are based on a total of 1,000 points. Grade = (total points earned / 1,000) × 100, rounded to the nearest integer, then matched to the scale below. Optional individual-presentation extra credit is added after this calculation and cannot raise a grade above A+.

Grading Scale

Final letter grades correspond to the following percentage ranges:

Percentage	Letter Grade	Percentage	Letter Grade
97.00 – 100.00	A+	93.00 – 96.99	A
90.00 – 92.99	A−	87.00 – 89.99	B+
83.00 – 86.99	B	80.00 – 82.99	B−
77.00 – 79.99	C+	73.00 – 76.99	C
70.00 – 72.99	C−	67.00 – 69.99	D+

Percentage	Letter Grade	Percentage	Letter Grade
63.00 – 66.99	D	60.00 – 62.99	D−
0.00 – 59.99	F		

Campus Academic Policies & Statements

Academic Integrity

The University of Illinois Urbana-Champaign *Student Code* (https://studentcode.illinois.edu/) should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy (https://studentcode.illinois.edu/article1/part4/1-401/). Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Use of Generative AI

The use of generative AI tools (such as ChatGPT, Claude, Gemini, or similar tools) is permitted in this course unless otherwise stated for a particular assignment or exam. These tools may be used to support your learning—for example, to clarify concepts, brainstorm ideas, improve writing, troubleshoot code, or assist with data analysis. However, AI should be used as a **supporting tool rather than a substitute for your own understanding and work**. You are responsible for verifying the accuracy of any AI-generated information and for ensuring that your submitted work reflects your own understanding of the course material.

If you use generative AI in completing an assignment, project, presentation, or other submitted work, you must **clearly disclose how you used it**. A brief statement at the end of your submission is sufficient (for example, *"I used ChatGPT to help debug my R code and to improve the clarity of my writing."*). You do not need to report minor uses such as spelling or grammar correction. Submitting AI-generated work without appropriate disclosure, or using AI when it has been specifically prohibited for an assignment or exam, may be treated as a violation of the course academic integrity policy. When in doubt about whether a particular use of AI is appropriate, please ask the instructor.

Students with Disabilities

The University of Illinois Champaign-Urbana, is committed to ensuring that all students, including students with disabilities, do not experience barriers to learning and participating fully in class. Students who have a letter of accommodation from DRES are advised to share that with instructors as soon as possible to ensure accommodation needs can be discussed and met.

To obtain disability-related academic accommodations, disabled students must contact Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, please visit 1207 S. Oak Street, Champaign, call (217) 333-1970, email disability@illinois.edu, or visit the DRES website (https://dres.illinois.edu/).

Family Educational Rights and Privacy Act (FERPA)

See FERPA – Office of the Registrar (https://registrar.illinois.edu/academic-records/ferpa/) for more information on the Family Educational Rights and Privacy Act (FERPA).

Mental Health

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Health Service Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (815) 720-4953 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

This statement is approved by the University of Illinois Counseling Center

Community of Care

As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regard to their well-being or yours, we encourage you to refer this behavior to the Connie Frank CARE Center (formerly the Student Assistance Center) in the Office of the Dean of Students. You may do so by calling (217) 333-0050 or by submitting an online referral (https://odos.illinois.edu/community-of-care/referral). Based on your report, staff in the Connie Frank CARE Center will reach out to offer support and assistance.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the Connie Frank CARE Center (https://odos.illinois.edu/community-of-care/CAREcenter) (formerly the Student Assistance Center) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

Disruptive Behavior

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office for Student Conflict Resolution (https://go.illinois.edu/ReportMisconduct), conflictresolution@illinois.edu, or (217) 333-3680 for disciplinary action.

Emergency Response Recommendations

Emergency response recommendations and campus building floor plans can be found at Public Safety's Run, Hide, Fight website (https://police.illinois.edu/em/run-hide-fight/). I encourage you to review this website within the first 10 days of class.

Religious Observances

It is the policy of the University of Illinois Urbana-Champaign to reasonably accommodate its students' religious beliefs, observances, and practices that conflict with a student's class attendance or participation in a scheduled examination or work requirement, consistent with state and federal law. Students must make requests for accommodation in advance of the conflict to allow time for both consideration of the request and alternate procedures to be prepared. Requests should be directed to the instructor. An optional resource to assist students in making such requests can be found on The Office of the Dean of Students' Religious Observances website (https://odos.illinois.edu/resources/students/religious-observances).

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including supportive measures, resources, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found on We Care Student Resources (https://wecare.illinois.edu/resources/students/#confidential).

Other information about resources and reporting is available on At Illinois We Care (https://wecare.illinois.edu).

Veterans and Military Students

As a military-friendly institution, and per federal regulations and Illinois statutes, the University of Illinois Urbana-Champaign has established policies and procedures to accommodate military-connected students. In addition to the support available at the Chez Veterans Center (https://chezveteranscenter.ahs.illinois.edu/), members of the National Guard or Reserves and active-duty military personnel with military obligations (e.g., deployments, training, drills) are encouraged to communicate these, in advance whenever possible, to the instructor. For policy details, see the Student Code on Excused Absences and Departure from the University for U.S. Military or other U.S. National Defense Services (https://studentcode.illinois.edu/article3/part3/3-313).

Course Schedule/Outline

References. Each topic lists the chapter/section where it is covered. R = Rice (main text); OI =OpenIntro (applied companion). Two 80-minute sessions per week (Tue/Thu); Schedule is tentative.

WEEK	DATE	PSET DUE	TITLE	Textbook
1	Aug 25 Aug 27		*Course Overview & Intro to Statistics*	*OI 1.3, 1.4*
2	Sep 1 Sep 3	**Pset I**	*Descriptive Statistics*	*OI 1.2 R 10.4-5; OI 2.1 R 10.3, 10.6-7; OI 2.1-2.2*
3	Sep 8 Sep 10	**Pset II**	*Elements of Probability*	*R 1.2-1.6; OI 3.1*
4	Sep 15 Sep 17	**Pset III**	*Random Variables*	*R.2.1-2.2; OI 3.4-3.5*
5	Sep 22 Sep 24	**Pset IV**	*Random Variables & Joint Distributions*	*R4.1-4.2, R 4.5 R 3.2-3.5*
6	Sep 29 Oct 1	**Pset V**	*Joint Distributions*	*R 3.4 R 2.3, R 3.6*

7	Oct 6 Oct 8	**Pset VI**	*Expectations, Covariance & Conditional Expectations*	*R 4.1, 4.3, 4.4*
8	Oct 13 Oct 15		*Review & Extended OH* ***Midterm***	
9	Oct 20 Oct 22		*Sampling distributions & CLT*	*R 6.3, 6.2* *R 5.2-5.3; OI 5*
10	Oct 27 Oct 29	**Pset VII**	*Point Estimations I*	*R 5.2, 8.3-8.5* *R 8.7-8.8*
11	Nov 3 (Nov 5)	**Pset VIII**	*Point Estimations II*	*R 5.2, 8.3-8.5* *R 8.7-8.8*
12	Nov 10 Nov 12		*Interval Estimation*	*R 8.5.3; OI 5.2* *R 9.1-9.2; OI 5.3*
13	(Nov 17) Nov 19	**Pset IX**	*Hypothesis Testing&* *Linear Regression I*	*R 9.2 – 9.4* *R 14.2; OI 8*
14	Nov 24 Nov 26		***THANKSGIVING BREAK***	
15	Dec 1 Dec 3	**Pset X**	*Linear Regression II*	*R 14.4* *R 14.5; OI 8-9*
16	Dec 8 Dec 11		*Review & Extended OH* ***Final Exam***	