Syllabus
ECON 5311: Applied Econometrics I
Fall 2019

Instructor/Office Hours

- Jungbin Hwang (jungbin.hwang@uconn.edu, OAK 333, Office hour: Monday/Wednesday: 2:30pm-3:30pm)

Graduate Assistant

- Jiaqi Wang (jiaqi.5.wang@uconn.edu, Oak , Office Hours: 11:00am–12:00pm on Tuesday)

Time and Location

- Regular classes on: Monday/Wednesday 12:20pm $\sim$ 1:10pm / OAK 112
- Discussion session: Friday 12:20pm $\sim$ 1:10pm / OAK 112: The Discussion session will be hosted by instructor/GA. In the discussions,
  - Discuss the problem sets in lecture notes, and help explain difficult materials.
  - Work out more examples in class.
  - Answer common questions related to class materials students may have.

Description of the Course

The world is full of uncertainty: accidents, storms, unruly financial markets, noisy communications. The world is also full of data. Probabilistic modeling and the related field of statistical inference are the keys to analyzing data and making scientifically sound predictions. Probabilistic models use the language of mathematics.

The main goal of this course is building introductory levels of statistical and mathematical backgrounds for a first-semester master students in economics, business and other social sciences. Statistics deals with techniques for collecting and analyzing data arising in many different contexts. Economic statistics involves the application of the techniques to various questions in economics, business and other social sciences. Economic statistics, on the other hand, provides basic material for studying econometrics which is a set of more comprehensive research tools for empirical analysis in these areas. Furthermore, while the applications are multiple and evident, we emphasize the basic concepts and methodologies that are universally applicable. The course covers all of the basic probability concepts, including: multiple discrete or continuous random variables, expectations, and conditional distributions laws of large numbers, point estimation, confidence intervals, and hypothesis testing.

In principle, no prior knowledge of probability theory or statistics is required. Knowledge of basic mathematics such as calculus is helpful for understanding material in this course. The contents of this course might be challenging but will enable you to apply the tools of probability theory to real-world applications or to your research.

Text book/References

Since I will provide slides of lecture notes that summarize overall materials, there are no required textbooks for the course, although the following will be useful references that can enhance the value of your techniques and wisdom in statistics.

- Modern Mathematical Statistics with Applications (2nd Edition, Springer) by Authors: Devore, Jay L., Berk, Kenneth N.
- The lady tasting tea: How statistics revolutionized science in the twentieth century. Macmillan, 2001. by Salsburg, David.

Course Web Page

A course webpage is available at **HuskyCT- https://lms.uconn.edu/**. It will include information relevant to the course, such as announcements, homework assignments, information on Stata tutorials, practice problem sets, solutions, updated syllabus, schedule and more. **You should check this page regularly.**

Grading Schemee

- Midterm Exam: 35% of Final Grade
- Final Exam: 45% of Final Grade
- Participation of Class: 20% of Final Grade

On a 100 point basis, here are all the cut-offs applied to get "final letter grade".

Converted Scale (%)	Letter Grade
>=90	A+
[85,90)	A
[80,85)	A-
[75,80)	B+
[70,75)	B
[65,70)	B-
[60,65)	C+
[55,60)	C
[50,55)	C-
[45,50)	D
Below 45	F

Exam Policy

- The mid-term and final exams are a closed-book/note, but students are allowed to bring to a cheat sheet that must be summarized in their own handwriting on a double-sided paper with letter size.
- Students are expected to be available for their midterm exam during the time stated. If you fall ill on the day of the exam and are forced to withdraw during the exam due to the illness, you must deliver a medical certificate explaining for the date of the exam within one week of the exam. The certificate must be issued by a physician or other medical personel and must be delivered to the faculty within one week after the exam date. Once the mid-term exam is properly exempted, the mid-term test score of the student will be replaced by the final exam score.
- In accordance with UConn policy, students are required to be available for their final exam and/or complete any assessment during the time stated. If you have a conflict with this time you **must obtain official permission to schedule a make-up exam with the Dean of Students**. If permission is granted, the Dean of Students will notify the instructor. Please note that vacations, previously purchased tickets or reservations, graduations, social events, misreading the assessment schedule, and oversleeping are not viable reasons for rescheduling a final.

Outlines

1. Lecture Note #1: Basic Probability Theory

   Key concepts: sample space, probability, conditional probability, Bayes theorem, independence, mutually exclusiveness

2. Lecture Note #2: Distribution Theory Random Variables and Probability Distributions

   Key concepts: random variables, probability distribution functions, probability density functions, mathematical expectations and moments, mean, variance, skewness, kurtosis

3. Lecture Note #3: Some Special Probability Distributions

   Key concepts: Bernoulli and binomial distributions, Poisson distribution, uniform distribution, normal distribution, chi-square distribution, t-distribution, F-distribution, distributions of the functions of a random variable, joint distribution, marginal distribution, conditional distribution, stochastic independence, measures of association: covariance and correlation

Oct. 11th (Friday): 12:20pm–1:50pm

4. Lecture Note #4-1: Statistical Inference I–II:

   Key concepts: Sampling and Sampling Distributions, populations and samples, sample distribution, sample moments and statistics, law of large numbers (LLN), central limit theorem (CLT), Point Estimation estimation methods, properties of point estimators,

5. Lecture Note #4-2: Statistical Inference III:

   Key concepts: Confidence Intervals (CIs), sampling from the normal distribution and CIs, CI for the mean, CI for the variance, CI for difference in means, Hypothesis Testing, types of hypotheses, one-sided tests and two-sided tests, type I and II errors, size of a test, power function, classical testing procedure, sampling from the normal distribution and test of hypotheses, hypotheses testing and confidence intervals, p-values and hypotheses testing

Final Exam (TBA)

Academic Integrity

You are responsible for acting in accordance with the University of Connecticut's Student Code[1]. Review and become familiar with these expectations. In particular, make sure you have read the section at Academic Integrity in Graduate Education and Research[2]. Cheating and plagiarism are taken very seriously at the University of Connecticut. As a student, it is your responsibility to avoid plagiarism. If you need more information about the subject of plagiarism, use the following resources:

- Plagiarism: How to Recognize it and How to Avoid It[3]
- University of Connecticut Libraries' Student Instruction (includes research, citing and writing resources)[4]

ADA Statement

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020, or http://csd.uconn.edu/.

[1] https://community.uconn.edu/the-student-code-preamble/.
[2] https://policy.uconn.edu/2014/04/11/policy-on-scholarly-integrity-in-graduate-education-and-research/
[3] http://lib.uconn.edu/instruction/tutorials/plagiarism.htm
[4] https://lib.uconn.edu/about/start-guides/undergraduate-students/