

Economics 603

Research Methods and Procedures in Economics

Fall 2016

TR 2pm – 3:15, BE 235

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Course Goal: To provide students a broad understanding of the statistical tools underlying econometric estimation and inference. Highlighting how assumptions and conclusions are related.

Course Objective: Students will be able to work with probability, random variables, and distribution functions and express the relationships between distributions and parameters of interest. Students will be able to assess unbiasedness and consistency, derive sampling distributions, and apply these concepts to inference for simple estimators.

Teaching Philosophy: Much of the syllabus below, unfortunately, constitutes rules and regulations you as the student must follow. Rather than set an adversarial tone, these rules are meant to establish a common approach that is applied equally to all students: fair and equitable treatment is important to me. I don't want to be a policeman. Testing and grading are also viewed as adversarial. I wish it weren't so. I view teaching as joint process: All of us working together to gain an understanding of important material. I am available for help if you are struggling. I want you to ask questions in class. I want you to answer my questions in class because thinking and participating are very important to understanding this material.

For many of you, this is your first semester in Graduate school. Graduate school is tough. Part of my job is to help you make the transition from undergraduate to graduate school. The expectations faculty place on graduate students are markedly higher than in undergraduate courses. We expect you to think. We expect you to put in lots of time. We expect you to put together ideas and concepts to gain deeper understanding. As undergraduates, you were typically in the top of the class. That means that to pass here, you must work hard enough to be in the top 10% of an upper division undergraduate class. If you want an A, work harder. But always keep in mind that I am available to help you. You will typically find that I am more than willing to find time for you outside of class.

I think what I tell you in class is the most important material. The regular homework is not a method of torture, it is meant to give you practice that will help in understanding the material. If you are stuck on the homework, you should come see me. Exams force you to be sure that you understand material.

Common Courtesy: Please be courteous to me and the other students in class.

Arrive before class begins, so as not to disrupt class.

Stay through the whole class.

Turn your cell phones OFF. If it rings, I get to answer it.

Don't talk to your neighbor when I or other students are talking. If you have a question, raise your hand. Don't ask your neighbor – they are just as lost as you are.

If you make an appointment to see me: show up or let me know ahead of time if something important comes up.

Recommended Textbooks: I am not requiring any text. These have been used in the past and provide various treatments of the topics we will cover. Feel free to find other useful resources.

Ashenfelter, Orley; Phillip B. Levine and David J. Zimmerman, *Statistics and Econometrics: Methods and Applications*, Wiley and Sons, 2003.

Hogg, Robert V., Joseph W. McKean and Allen T. Craig (deceased). *Introduction to Mathematical Statistics*. Prentice Hall, New Jersey, 2005.

Ramanathan, Ramu. *Statistical Methods in Econometrics*. Academic Press, 1993.

Topics and Approach:

This course is a course in “Mathematical Statistics” with an emphasis on applications for empirical work in economics and related subjects. There are two main portions of the class. The first half of the class will focus on probability theory. We will cover probability, random variables, distributions, moments. The second half of the course will focus on estimation and inference covering the properties of estimators, sampling distributions, confidence intervals, and hypothesis tests. The main goal of the course is for students to understand basic probability concepts and their applications to empirical analysis. Some of the problem sets will involve simple empirical work. The student is free to use whatever software they have available and feel comfortable with. This instructor can be a reference for STATA.

Evaluation: There will be regular homework assignments, a midterm exam and a final exam. The final grade will be determined by a weighted average of these three parts:

Assignments	33.3%	Weekly
Midterm Exam	33.3%	October 20 (BE 235)
Final Exam	33.3%	December 15 (1 PM, BE 235)

The midterm exam will cover material up through the exam date. The final exam will be “comprehensive” and will cover material from the entire course. However, the final exam will be heavily skewed to cover material presented after the midterm. Generally, the material tested on the final exam will be the material used during the second half of the class (this means that we will draw on the material from the first half of the class during the second half of the class).

Exams and Assignments: Exams must be taken at the designated time. Only official excuses (see below) are permissible for missing an exam. All exams are closed book and closed note. Students are allowed a 1 page (front and back, 8 1/2 by 11) formula sheet and a calculator.

There will be homework assigned approximately every week. I expect there will be about 10 problem sets over the semester (9 or 8 or 7 is also a possibility-depending on time). Your homework will require you to use a calculator and in some cases a computer. Problem sets will be graded on a 10 point scale. Your final score (for grading) will be the average of all problem set scores.

All assignments are due by 5pm on the date specified on the homework. I am a stickler about the 5pm deadline: assignments that are turned in after 5pm are considered late. I set my computer's clock to the U.S. Naval Observatory Master Clock: the official source of time for the Department of Defense and the standard of time for the United States. Assignments that are less than 3 business days late will be awarded a score no higher than the lowest score received by on time students. Suppose Johnny Come Lately turns in the assignment 2 days after the due date. He gets all problems right. The lowest score for that assignment is a 6: Johnny gets a 6. If Johnny had gotten 80%, Johnny would get 5.4 points. Homework over 3 business days late will not be accepted for credit.

Attendance Policies and Excused Absences: I don't take attendance. You are all adults who can decide whether you wish to attend class or not. However, I am also not required to repeat material from previous lecture or give you private lectures on material you choose to miss. You are responsible for obtaining lecture notes from a classmate.

The following are acceptable reasons for excused absences from exams: 1) serious illness; 2) illness or death of family member; 3) University-related trips; 4) major religious holidays (from Faculty Senate Rules 5.2.4.2.C). It is the student's responsibility to inform me of the absence, preferably in advance, or as soon as reasonably possible (Faculty Senate Rule 5.2.4.2.D). The burden of proof is on the student to provide sufficient documentation regarding the nature of the absence, and I retain the right to ask for such proof. The little yellow slips from the University Health Service are not proof. It is your responsibility to make proof easily and completely available to me. For class assignments, you are responsible for turning them in on time, unless the illness or other excused absence prevented you from being able to attend class and work on the assignment for a majority of the duration of the assignment.

Cheating: I don't like cheating. I really abhor plagiarism. The Faculty Senate has decided that the minimum penalty for cheating is an E for the course. What constitutes cheating? Many cases are obvious: copy answers off another person's exam, for example. Let me clarify other areas of cheating for this class.

Homework: I do not mind, in fact I encourage students to work together. Copying someone's answers is not working together. To this end, I require that all written explanation be in YOUR OWN words.

Exams: I allow one (1) page (8 ½ by 11) of notes. I allow calculators. Anything else is unacceptable. You must take the exam yourself, using only your talents and knowledge.

Appeal Procedure: If, after an exam or assignment is graded, you believe that additional credit is deserved, you may submit a written appeal for up to one week after the assignment is graded. Your appeal should be a typewritten page or less explaining specifically: which items deserve more credit and why. Please note: your argument must be based on the answer actually turned in. Please do not give a new answer and expect more credit. Also, the argument "I meant to say..." doesn't work.

Accessibility and Accommodation: In order to meet the requirements of federal legislation, the University has enacted campus policies and procedures to ensure each qualified person shall receive the reasonable accommodations needed to ensure equal access to employment, educational opportunities, programs, and activities on campus. Students with a disability requiring some accommodation should contact the Disability Resource Center (2 Alumni Gym) and obtain a Letter of Accommodation. I will be pleased to work with any student providing this documentation to ensure that they have all the resources needed to succeed in my class.

Tentative Outline

Week	Topic
Aug 25	Syllabus & Probability
Aug 30	Probability
Sept 6	Random Variables
Sept 13	Summary Parameters
Sept 20	Multivariate Distributions
Sept 27	Properties of Estimators
Oct 4	Sampling Distributions
Oct 11	Inference
Oct 18	EXAM week (exam 10/20)
Oct 25	Maximum Likelihood
Nov 1	Testing in MLE
Nov 8	Method of Moments
Nov 15	Simple Linear Regression
Nov 22	Thanksgiving Week
Nov 29	Simple Linear Regression
Dec 6	Catch Up or additional topics
Dec 15	Final Exam, 1PM

This is only tentative and meant to provide some guideline as to topics likely to be covered. It is ambitious and I seldom get through all of this material.