

# Syllabus

Introduction to Econometrics - Economics 4818-001  
Spring 2007, MWF 12:00-12:50, Econ 117

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Hours: Monday 1-2, Friday 9-11

Economics 4818 is an introduction to the practice of econometrics, which has a range of applications in economic research. I like to think of econometrics as methods for using data and statistics to provide evidence for economic theory. This course will feature a mixture of learning both basic econometric methods (think of this as a “tool kit”) and learning how to apply these methods to answer economic questions. The goal of this course is to provide you with enough understanding and experience to use econometric analysis in your career: in government, academic or commercial applications.

The text for this course will be: **Introductory Econometrics: A Modern Approach (3<sup>rd</sup> Edition)**, by Jeffrey Wooldridge. New copies are expensive, but there should be used copies available if you buy early. You may be able to find a copy online that is less expensive, but keep in mind you will need it by January 17<sup>th</sup>. The second edition is usable; its text is identical to the 3<sup>rd</sup> edition, but is missing some practice problems. The text is important, as most of the concepts I teach will come directly from it. Keeping up in the readings is essential.

**Economics 3818 is the prerequisite for this course.** This is because the course requires familiarity with probability and statistics. Appendices B and C of the text summarize the necessary concepts in probability and statistics. It will be useful to review these, and I will spend some time on them in class. If you have taken a statistics course in the applied math department, such as “Introduction to Mathematical Statistics” 4520 or “Statistical Methods” 4570, this will certainly substitute for the prerequisite. Of course, to understand probability and statistics you need a basic understanding of algebra and calculus. I encourage you to review these independently. A good starting point would be appendix A of our text.

Feel free to meet with me and discuss econometrics during my office hours, posted above. Unfortunately there is no TA for this class, and my ability to meet outside of those hours is limited. Individual appointments may be made in extraordinary circumstances, such as an extended illness.

This is a 4000 level class, and I expect each lecture to be an exercise in civil discourse. Please be aware of university regulations concerning classroom conduct, as stated in: <http://www.colorado.edu/policies/classbehavior.html>. Use of cell phones and laptops is prohibited while class is in session – if you are browsing the web you are clearly not paying attention in class, and distracting other students as well. Also, please keep entry and exit of the classroomness.

<http://www.colorado.edu/academics/honorcode>. Cheating on the exams is strictly forbidden. You may help each other complete the econometrics project (see below), but the draft you turn in must be original; plagiarism of anyone, both inside or outside the class, is a violation not only of the University Honor Code but also of your academic integrity. In general, collaboration on the problem sets and computer exercises is permitted, although separate assignments must be received from each of you. All assignments must be submitted in class, in person, on the day they are due, unless you notify me in advance of a reason that you must be absent.

In accordance with the recommendations from Disability Services, I will make reasonable accommodations for students with disabilities. If you have a disability and anticipate requiring changes in the testing or teaching environment, please submit a letter from Disability Services during the first or second week of class describing such changes. Information about Disability Services can be found at:

<http://www.colorado.edu/disabilityservices/>

Conflicts in scheduling between religious observances and exam dates should be brought to my attention at least two weeks in advance, so th

3. estimate the direction and magnitude of the relationship, and
4. write a paper about the relationship based on your estimates.

Let me describe in each of these steps in detail:

### **(1) Choose an economic relationship to study.**

This is entirely up to you. The relationship doesn't have to be novel, and you can even duplicate studies that have been published in economic journals. Plagiarism, whether it is of a professional publication or of another undergraduate student, is of course strictly prohibited. The difference between duplication and plagiarism is that while you may choose the same relationship for part (1) as another study, the other parts must be unique to your paper, so that you end up studying the same relationship in a different way. Examples of relationships to study include demand functions for a particular product, labor supply in a particular market, the pricing of environmental public goods, household outcomes in a developing country or even a relationship between macroeconomic variables (interest and inflation, GDP growth and unemployment, etc). Many examples will be given in class. Think broadly when picking your topic. In general, you will want to study a causal relationship: your dependent variable should be some economic behavior that people exhibit, and your independent variables should be any variables, economic or not, that may influence such economic behavior. The more sophisticated your chosen relationship, the more lenient I will be with grading.

### **(2) Find data for the variables.**

One approach is to pick the relationship first and look for matching data. For very simple relationships this may work, but an alternate approach will be to find interesting data and formulate a relationship that it can describe. You will probably need to find your dependent variable first, and then think about possible explanatory variables to go with it and look those up separately. Here is a partial list of possible data sources:

- Wooldridge Data Sets: A diverse collection of simple data sets assembled by the textbook author.
- World Bank : Available online through Norlin Library, this provides hundreds of country level variables.
- International Monetary Fund : Also available online through Norlin, this provides country level financial variables.
- [www.bls.gov](http://www.bls.gov): Detailed monthly data on U.S. unemployment and inflation, as well as wages and salaries.
- [www.census.gov](http://www.census.gov): Detailed data about the U.S. population from the U.S. census. Also, the Economic Census collects data every five years about U.S. firms and industries.
- [www.bea.gov](http://www.bea.gov): Macroeconomic variables such as U.S. GDP, gross state product and U.S. current account.
- Compustat database – Detailed data about U.S. and multinational companies. Available online through Wharton Research Data Services (WRDS), but only through terminals in the business library.
- Development Gateway Foundation - <http://home.developmentgateway.org/>  
A website with links to many agencies that collect data, including the IMF, OECD and UN, as well as national statistical offices.

This is a partial list, and I encourage you to look for data on your own. Another approach is to try to replicate an already published academic work. Only a few authors list where they got their data, or provide it on their website, so you may need to search a while to find one that you can replicate. You may find articles in journals such as the

or the . Don't try to replicate an article that you don't understand!

If your honors thesis contains an empirical component, you may submit this as your econometrics project. You may need to revise the econometric methods in your paper however, because it will be evaluated on how well you apply what you learn in this

The computer exercises are assignments that will also be posted online, and will be done with a computer program. These must be typed, and may be done jointly with a partner. The recommended program is E-views, which is installed in the department

3/19: Static time-series models (10.1, 10.2)  
3/21: Form of functions and variables in time series estimation (10.3, 10.4)  
3/23: Trends and Seasonality; examples of time-series regressions (10.5)  
3/26: SPRING BREAK (no class)  
3/28: SPRING BREAK (no class)  
3/30: SPRING BREAK (no class)  
4/2: Proxy variables (9.2)  
4/4: Measurement error (9.3)  
4/6: **Paper Assessment Due**, Examples of econometric studies  
4/9: Sampling Bias (9.4)  
4/11: Endogeneity and functional form (9.1)  
4/13: **Problem Set 4 Due**, Topic TBA  
4/16: Review Problem Set 4, Heteroskedasticity in cross-sectional models (8.1, 8.2)  
4/18: Testing for heteroskedasticity (8.3)  
4/20: **Econometrics Project Due**, Correcting estimates with heteroskedastic errors (8.4)  
4/23: Serial Correlation (12.1)  
4/25: Testing for serial correlation (12.2)  
4/27: **Problem Set 5 Due**, Correcting for serial correlation (12.3)  
4/30: **Computer Exercise 3 Due**, Review Problem Set 5, differencing time series (12.5)  
5/2: Review for final  
5/4: Review for final  
5/7: FINAL EXAM – 4:30 to 7:00 PM