

ECO 481/581
Econometrics II
Class No 18197/17231
Spring 2016

Instructor: Professor Joanne Song McLaughlin
Office: 441 Fronczak Hall
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Office Hours: Th 4:30 - 6:30 pm

Class Information:

Class Meetings: MW 6:50-8:10 pm, NSC 210
Credits: 3 credits
Section: A

Teaching Assistant: To be assigned by the second week.

Prerequisites: ECO 480/580 or (MTH 411 or STA 301) and (MTH 412 or STA 302)

Course Description:

This course will extend your knowledge of econometrics beyond the simple linear regression models you learned in ECO 480. Econometrics is a tool which allows one to use data and statistical techniques to answer real-world questions and test predictions of economic theory. This course is the second in a two-course sequence on basic applied econometrics. It focuses on applications and interpreting the findings of econometric studies.

The goal of this class is for you to be able to implement and interpret the results of the linear regression models, as well as to learn additional topics such as use of panel data, nonlinear regression functions, limited dependent variable models, instrumental variables models, causal inference, and introductory time series. You should also be able to use these various models to analyze data, and critically assess studies using these models. You should be able to articulate why a model may give misleading results, and what to do about such a problem. Understanding and being able to explain the key concepts is an important part of this course.

An important part of the class will be use of the STATA statistical package to analyze data. Econometrics is used in business, government, and academia for purposes such as studying the effects of government policies, using historical data to forecast future values of variables such as the stock market, analyzing markets, and testing the predictions of economic theory. Knowledge of econometrics is valuable for many types of jobs and knowing a software package such as STATA is also extremely valuable.

Course Material:

1. Textbook: *Introductory Econometrics: A Modern Approach*, 6th Edition by Jeffrey Wooldridge. You may use previous editions. However, you are responsible for material

in the 6th edition (in particular, material and homework questions). You may come by office hours to examine a copy of the 6th edition.

2. Textbook: *Mastering 'Metrics: The Path from Cause to Effect* by Joshua Angrist and Jorn-Steffen Pischke.
3. Computer Software Package: STATA
STATA is available at a large discount for students. You need at least STATA IC version to do problem sets.

STATA website: <http://www.stata.com/order/new/edu/gradplans/student-pricing/>

STATA is a fast and versatile program that was written by economists so it is more intuitive for people in our field. STATA is the program of choice for applied micro economists. Knowledge of STATA will greatly enhance your ability to get a job after graduation. If you are not familiar with Stata, I strongly encourage you to begin with the video tutorials listed on page 6. Upon my approval, you may use R, Matlab, or SAS if you are more familiar with these programs. You may NOT use Excel.

Problem Sets: There will be 4 problem sets and they are equally weighted. The problem sets consists of solving theoretical problems. These are difficult and time-intensive, so plan ahead. The problem sets will require that you work at a higher level of difficulty than the book, solving formal problems. You are required to hand in **INDIVIDUAL** written solutions to the problem sets. Students are permitted and encouraged to work together on problem sets. But because the material on problem sets will be similar to that on the exams, it is critical that you understand the material independently. No late work or electronic copy will be accepted.

Computer Assignments: There will be 2 computer assignments and they are equally weighted. The problem sets consists of analyzing real data using STATA. It will require you to build an econometric model and interpret and analyze the results. If you are new to STATA, plan on spending more time in the beginning. Students are permitted to discuss the questions, but you are required to hand in your **OWN** independently written solutions to the problem sets, relevant STATA output, and the organized and well-commented do-files for all the exercises. No late work or electronic copy will be accepted.

Empirical Projects: A group research project is due Monday, May 2. I will provide you with a data set and a fairly narrow research question and you will be expected to review the relevant literature, estimate models to answer the particular question, and write up the results as if this were an academic paper. You will work in groups of three and you must identify your group by 4th week of the semester (i.e., February 17, 2016). If you cannot find a group, I will assign you one. It is assumed that if your name is on the paper, you equally divide up the work and each of you made significant contribution to the project. Grades on the paper will be based on the quality of the writing, the justification for the model you estimate, and the accuracy with which you interpret your statistical models. If you have never written an empirical academic paper before, please read Chapter 19, Wooldridge. Although it is

not required, you may volunteer to present your work for extra credit. You need to sign up for this when you identify your group since I need to allocate class time for your presentations.

Exams: There will be 2 in-class midterm exams and a final exam. Two midterm exams are equally weighted. I will announce the midterm exam dates in class, but the final exam will be held during the University's assigned finals period. Your final exam schedule is available in your HUB Student Center via MyUB. All the exams will be cumulative and they may cover any material from the assigned readings in the text, the problem sets, and any additional material that I cover in class.

Attendance, Class Participation, and Quizzes: I expect you to attend class, and you will be responsible for material covered in class that is not available in the text or elsewhere. Please ask questions if there are things you do not understand. Please get notes from someone else if you miss class, I will not be handing out or posting lecture notes.

Student Learning Outcomes:

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

1. Analyze data and apply empirical or theoretical methods to guide decision-making. (Maps to UBGE, SUNY Mathematics, MSCHE Quantitative Reasoning, MSCHE Critical Analysis & Reasoning.)
2. Interpret mathematical models, formulas, graphs, and tables, and draw inferences from them. (Maps to UBGE, SUNY Mathematics, MSCHE Quantitative Reasoning, MSCHE Critical Analysis & Reasoning.)
3. Choose appropriate models for a given problem, using information from observed or deduced data and knowledge of the system being studied. (Maps to UBGE, SUNY Mathematics, MSCHE Quantitative Reasoning, MSCHE Critical Analysis & Reasoning.)
4. Employ quantitative methods, mathematical models and/or statistics to develop well-reasoned arguments to identify and solve real world problems beyond the level of basic algebra, while also being able to recognize the limitations of mathematics and statistics. (Maps to UBGE, SUNY Mathematics, MSCHE Quantitative Reasoning, MSCHE Critical Analysis & Reasoning.)
5. Recognize common mistakes in empirical and deductive reasoning, and mathematical and quantitative problem solving. (Maps to UBGE, SUNY Mathematics, MSCHE Quantitative Reasoning, MSCHE Critical Analysis & Reasoning.)
6. Express inferences and conclusions in writing. (Maps to UBGE, SUNY Basic Communication, MSCHE Written Communication)

These outcomes will be delivered through combination of lecture, discussions, class participations, problem sets, computer assignments, presentations, term paper, and exams. Student achievement is assessed based on the performance and quality of required assignments, class

participation, and exams.

Grading Policy: For grading, the problem sets (4) will count for 20 % of the grade, the computer exercises (2) for 10 %, the midterm (2) for 20 %, the final for 25 %, the empirical project for 20 %, and the attendance, class participation, and quizzes for 5 %. In borderline cases, improvement during the semester, useful class participation, and extra credit assignments (or quizzes) will positively influence your grade. There is no fixed curve for grading.

Exam Policy: There will be no rescheduling of exams. If you are unable to attend the in-class midterm or final exam, you must provide a legitimate excuse, such as a note from your doctor. Any doctor's note must include a privacy waiver form allowing the College of Arts and Science to call the doctor's office to verify the authenticity of the note. There will be no makeup exams. If you have a valid excuse for missing the midterm, all of the exam part of your grade will be determined by the final exam.

Grading Questions: If you think that your exam has been graded incorrectly, you must write up why you think so, and give this to me within 1 calendar week of getting the exam back. Note that your entire exam is open to regrading, so your grade could go down as well as go up. This policy applies to problem sets as well.

Academic Honesty: You should be familiar with the UB's policy on academic honesty, <http://undergrad-catalog.buffalo.edu/policies/course/integrity.shtml>. If I discover any evidence of cheating, dishonest conduct, plagiarizing, or inappropriate collusion on exams, the students will be given Fs, and otherwise sanctioned to the full extent possible. These terms are explicitly defined at the URL above. Note that cheating includes use of cell phones, PDAs, portable music devices, any other unauthorized book, papers, or device. Leaving the exam room before turning in your exam is cheating. I may request an electronic copy to prevent and check for plagiarism.

Incomplete Grades: Assignment of an incomplete grade ("I") is completely at my discretion. You should be familiar with incomplete grade policies.

<http://undergrad-catalog.buffalo.edu/policies/grading/explanation.shtml#incomplete>

A grade of incomplete indicates that additional course work is required to fulfill the requirements of a given course. You may only be given an "I" grade if you have a passing average in coursework that has been completed and have well-defined parameters to complete the course requirements that could result in a grade better than the default grade. An "I" grade may not be assigned to a student who did not attend the course. Prior to the end of the semester, you must initiate the request for an "I" grade and receive my approval. Assignment of an "I" grade is at my discretion. Upon assigning an "I" grade, I will provide, in writing or by electronic mail, of the requirements to be fulfilled, and shall file a copy with the appropriate departmental office. I must specify a default letter grade at the time the "I" grade is submitted. A default grade is the letter grade you will receive if no additional course work is completed and/or a grade change form is not filed by me. "I" grades must be completed within 12 months. I may set shorter time limits for removing an incomplete than the 12-month time limit.

Accessibility Resources: If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the Office of Accessibility Resources, 25 Capen Hall, 645-2608. The office will provide you with information and review appropriate arrangements for reasonable accommodations. More information can be found at <http://www.student-affairs.buffalo.edu/ods/>. You should also contact me privately to discuss your specific needs.

Course Fees: The approximate course fees for textbooks (older edition) and STATA (6 month license) is USD150.

Cell Phone Policy: Please turn off your cell phones or put them on silent and put it away. Please be courteous to me and your fellow students in your use of other electronic devices as it can be extremely distracting. Do NOT take any pictures in my class.

Tentative schedule:

- Review of bivariate regression model (Review: Chapter 1 and 2, Wooldridge)
- Multiple regression analysis: estimation (Chapter 3, Wooldridge)
- Multiple regression analysis: inference (Chapter 4, Wooldridge)
- Multiple regression analysis: further issues (Chapter 6 and 9, Wooldridge)
 - Nonlinear regression functions
 - Measurement error
- Dummy variables (Chapter 7, Wooldridge)
- Binary dependent variable (Chapter 17, Wooldridge)
- Experiments (Chapter 1, Angrist and Pischke)
- Panel data models (Chapter 13-14, Wooldridge; Chapter 5, Angrist and Pischke)
- Instrumental variables (Chapter 15, Wooldridge; Chapter 3, Angrist and Pischke)
- Regression discontinuity models (Chapter 4, Angrist and Pischke)
- Introductory time series (Chapter 10-12, Wooldridge)

Getting Started with STATA

Useful Online Resources

<http://data.princeton.edu/stata/>
<http://www.ats.ucla.edu/stat/stata/>

Useful Video Tutorials

About one hour very useful video workshop - [Click Here](#)
Video tutorials by topic - [Click Here](#)

Basic Commands

insheet
infile
use
reshape
generate
egen
replace
if
recode
drop
keep
list
sort
destring
tostring
rename
tab
describe
summarize
mean
proportion
ttest
histogram
scatter
stem
correlate
regress
predict