

ECON 442: Econometrics

INSTRUCTOR: Dr. Caleb S. Fuller
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OFFICE HOURS: MWF: 8:50-10:50am
TR: 2:30-4:30pm
Or by appointment

This syllabus is a contract between myself and you. I will work hard to uphold the guidelines outlined here, and expect you to do the same. That said, I reserve the right to make changes if necessary.

TEXTS

Required: Stock, James and Mark Watson. 2015. *Introduction to Econometrics, 3rd edition, Updated*. Pearson.

Optional: Wooldridge, Jeffrey. *Introductory Econometrics: A Modern Approach*. Any edition (there are no assigned readings from this text, but you might find it helpful to consult). South-Western College Publishers.

Optional: Studenmund, A.H. *Using Econometrics: A Practical Guide*. Any edition (there are no assigned readings from this text, but you might find it helpful to consult). Pearson.

PREREQUISITES

Math 141 OR 161. BUSA 201.

COURSE DESCRIPTION

This course introduces the basics of econometrics, the application of statistical techniques to economic problems. Econometrics differs from pure statistics in that econometric analysis is typically founded on economic theory. We will study linear and multiple regression methods, followed by an exploration of experimental and quasi-experimental designs that have become increasingly important in applied economic research. Emphasis will be placed on estimating the quantitative magnitude of cause and effect relationships.

COURSE OBJECTIVES:

This course is intended to equip students to:

1. Understand and describe linear regression. This will be assessed by three exams, homework, a paper analysis and related in-class presentation. [2, 3, 4, 5, 6, 7, 8, 9]
2. Use regression analysis to test the relationship between variables. This will be assessed by three exams and homework. [4, 5, 6, 7, 8, 9]
3. Select the proper method of statistical analysis for the question and the available data. This will be assessed by two exams, homework, a paper analysis and related in-class presentation. [4, 6, 7, 8, 9]
4. Interpret the results of statistical analysis. This will be assessed by three exams, homework, a paper analysis and related in-class presentation. [4, 5, 6, 7, 8, 9]
5. Articulate critiques of econometric research. This will be assessed by the final exam, a paper analysis and related in-class presentation. [1, 2]

TENTATIVE SCHEDULE OF TOPICS, ASSIGNMENTS, AND EXAMS

<u>DATE</u>	<u>TOPIC</u>	<u>READING</u>
Jan 23	Introduction	S&W: 1-12
Jan 25	Random Variables	S&W: 14-23, 26-35
Jan 30	Probability Distributions	S&W: 36-42
Feb 1	Sampling and Sample Statistics	S&W: 43-52; 65-71
Feb 6	Hypothesis Tests and Confidence Intervals	S&W: 71-82
Feb 8	Hypothesis Tests and Confidence Intervals	S&W: 71-82
Feb 13	Simple Linear Regression: Estimation	S&W: 109-119; 141-142
Feb 15	Simple Linear Regression: Measures of Fit	S&W: 119-124
Feb 20	Simple Linear Regression: Inference	S&W: 146-155
Feb 22	Simple Linear Regression: Theoretical Properties PAPER APPROVAL DEADLINE	S&W: 124-133; 142-145; 157-165
Feb 27	SPRING BREAK	
Mar 1	SPRING BREAK	
Mar 6	Midterm Exam 1	Study
Mar 8	Multiple Linear Regression: Estimation	S&W: 189-198
Mar 13	Multiple Linear Regression: Inference	S&W: 217-232
Mar 15	Multiple Linear Regression: Multicollinearity	S&W: 199-200; 202-206
Mar 20	Multiple Linear Regression: Omitted Variables	S&W: 182-189; 232-234

Mar 22	NO CLASS	
Mar 27	Multiple Linear Regression: Model Selection	S&W: 232-244
Mar 29	EASTER BREAK	
April 3	Dummy Variables	S&W: 155-157; 204
April 5	Logged Variables	S&W: 256-278
April 10	Interactions	S&W: 278-293
April 12	Limited Dependent Variables	S&W: 385-398
April 17	Midterm Exam 2	Study
April 19	Validity	S&W: 315-330
April 24	Validity	S&W: 331-342
April 26	Experimental Designs	S&W: 475-493
May 1	Quasi-Experimental Designs	S&W: 493-502
May 3	Quasi-Experimental Designs	S&W: 502-504
May 8	Conclusion	Rizzo: "Praxeology and Econometrics: A Critique of Positivist Economics"
May 10	Study Day	
May 15	FINAL EXAM: 2-4 PM	Study

This is a tentative schedule. If it proves to ambitious, I will attempt to say less about each topic, rather than cutting topics entirely.

COURSE REQUIREMENTS, EVALUATION, GRADING

Final grades are based on two (2) midterm exams, (approximately) bi-weekly homework, one paper analysis and associated in-class presentation, and one (1) comprehensive final exam. Econometrics covers complex and abstract material. **Thus, it is imperative that you come to class having done the readings to do well on exams.**

Each student will select a published econometrics paper to write about. **As this is an introductory course in econometrics, you should choose a simple paper that uses linear regression.** You will write a "referee report" on the paper of your choice and present your report to the class. Your report and presentation should be sufficiently clear and thorough that someone who has never seen the paper can understand the author's question, methodology, data source, and potential weaknesses of the paper.

You must approve a paper for analysis by February 22.

Beginning **March 27**, there will be two presentations each class until the conclusion of the semester (except for the day of exam 2). These presentations cover the content of the students' referee reports. A presentation grading rubric is available on myGCC. The ability to meet deadlines is a skill that is required in virtually every potential opportunity after you graduate. **As a result, (unexcused) late papers will receive a grade of zero.** Your paper is due on the date you present.

The final grade is calculated as follows:

- (1) Midterm exam 1: 15%
- (1) Midterm exam 2: 20%
- (3) Homework sets: 15%
- (1) Paper + Presentation: 25% (Paper: 15%; Presentation: 10%)
- (1) Comprehensive Final: 25%

Grading Scale:

A: 93-100 **A-:** 90-92.9 **B+:** 87-89.9 **B:** 83-86.9 **B-:** 80-82.9 **C+:** 77-79.9
C: 73-76.9 **C-:** 70-72.9 **D+:** 67-69.9 **D:** 63-66.9 **D-:** 60-62.9 **F:** <60

There will be no make-up exams. If you must miss an exam, please discuss it with me prior to the exam. In the event of an emergency, you should email me as soon as possible. If you miss an exam and I have not accepted your excuse, a grade of “0” will be given. If the absence is excused, the weight of that exam will be added to the final exam.

The final exam must be taken at the scheduled time. One exception: students who have three or more finals scheduled for the same day may discuss with me an alternative time to take the final.

There will be no make-up assignments. All assignments must be hard-copy and stapled; they are due at the beginning of class.

IN-CLASS EXPECTATIONS

The use of phones and laptops is prohibited in class. I did not make this decision lightly. Many elite institutions, including law schools, have chosen to ban electronics from the classroom on the same grounds that I do so: studies have repeatedly demonstrated that laptop usage exerts a statistically significant, negative effect on classroom outcomes. For example, a recent study of Principles of Economics classes at West Point found that when laptops were banned, students scored, on average, .18 standard deviations higher than their peers in laptop-using classrooms.¹ Several studies also demonstrate that taking notes by hand is, on average, superior for learning and retention than is taking notes by electronic device.² However, the strongest argument for a laptop ban comes from recent studies indicating that laptop usage harms the performance of non-laptop-using students in a laptop-using classroom.³ When someone’s activity imposes costs on someone else, economists call it a “negative externality.” My policy of banning electronics is an attempt to mitigate negative externalities in the classroom.

ECONOMETRICS REFEREE REPORT GUIDELINES

Each student will complete a 1,200-1,500-word written analysis of a peer-reviewed econometrics paper. **When you turn in your assignment, include the name of the article, the author(s), and the name of the journal in which the article is published.** Your analysis should clearly

¹ See here: <http://educationnext.org/should-professors-ban-laptops-classroom-computer-use-affects-student-learning-study/>.

² See here: <https://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/> or here: <https://sites.udel.edu/victorp/files/2010/11/Psychological-Science-2014-Mueller-0956797614524581-1u0h0yu.pdf>.

³ See here: <http://www.sciencedirect.com/science/article/pii/S0360131512002254?via%3Dihub>.

summarize the article, but most importantly should offer at least one economic critique. This assignment will enable you to interact critically with the best of what the broader economics profession has to offer.

The only requirements are 1. that the article contain econometrics and 2. that you understand it. **Any citations (you're not required to cite anything other than the article in question) should adhere to the Chicago Style Author-Date format.** You may find examples here: <https://owl.english.purdue.edu/owl/>

When a scholar submits a paper for publication in a professional journal, it is subjected to rigorous scrutiny by the author's professional peers who offer feedback by way of a referee report. Superior analyses for this class will adhere to the best practices in writing a professional referee report. Because the purpose of a referee report is to offer your own original thoughts on a paper, there is no requirement that you consult outside sources (though you are free to do so). A grading rubric is available on myGCC. Your written assignment should:

- Begin with a brief overview of the paper to provide someone who's never read the paper with a working knowledge of it.
- Succinctly describe the paper's primary contribution. What question did the paper ask and what answer did it provide?
- Describe the author's methodology. How do they attempt to answer the question?
- Describe the author's data source and how the data is generated.
- Offer a significant critique or a suggestion about how the author could improve his work. For example: Does the model suffer from omitted variable bias? Is the author's model appropriate for the question? Is there likely to be measurement error? Does the model suffer from endogeneity?

Additionally, each student will present their referee report in class for a presentation grade. More details on this in class.

COLLEGE REGULATIONS

This course complies with the Attendance Expectations and Academic Integrity policies of the College as described in the Grove City College Bulletin. Attendance at all classes for which a student is registered is essential to the satisfactory completion of the course. If an absence is incurred for any reason, it is the obligation of the student to ascertain from the instructor what is to be done to maintain his/her standing in the course.

A student may have unexcused absences which total less than or equal to the number of times the class meets per week. In other words, classes meeting four times per week allow four unexcused absences; three times per week allow three unexcused absences, etc. Absences are excused for authorized GCC activities, loss of immediate family member, and Zerbe-certified illness or injury. Please consult the College Bulletin (pgs. 53-54) for more details on college attendance policy.

Academic Integrity: The GCC community maintains strict standards for academic integrity and honesty. By signing their application form, all GCC students have pledged themselves to academic integrity. Please consult the College Bulletin (pgs. 55-57) for what constitutes academic dishonesty and plagiarism.

In doing papers or assignments outside of the classroom, taking exams and quizzes, and preparing for exams and quizzes, students should do their own work and not cooperate with, aid, or encourage other students to violate this policy. Consult the College Bulletin for more details on what constitutes a violation of college policy.

In addition, by vote of the GCC faculty, a student who violates, or who assists another to violate, the Honesty in Learning Policy shall be penalized with a minimum of a failing grade for the specific work for which the dishonesty was committed. More severe penalties may be imposed by faculty including failure in the course. For the processes through which incidents are handled consult the College Bulletin.

Accessibility & Accommodations: If you anticipate physical or academic barriers based on a disability, please let me know immediately so that we may discuss options. You may also contact the disability services office to establish accommodations. The Disability Services Coordinator may be reached at (724)-264-4673 or disabilityservices@gcc.edu.