University of Missouri – Columbia

Spring 2019

ECON 4371, ECON 7371: Introductory Econometrics

Syllabus

Classes: Middlebush Hall 13, Mon. and Wed., 2-3:15 pm

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Office Hours: Monday, 9:30-10:30am, or by appointment

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Course objectives

Economics is a quantitative science, and its claims can only verified with the quantitative analysis of economic data. Econometrics is the main tool for such analysis.

This course is a rigorous and comprehensive introduction to Econometrics, and therefore should be considered an essential part of any economist's preparation.

We begin with a (brief!) review of probability and statistics, followed by:

- Linear regression techniques for cross-sectional data (estimation, hypothesis tests, confidence intervals, etc.), also known as: the workhorse of econometrics.

- Nonlinear regression techniques, that is: what to do when the data refuses to lie on a straight line?

- Panel data: what do we gain by measuring the same entity more than once?

- Binary dependent variables, and in particular: can we model the probability of an event happening?

- Instrumental variable techniques, used when data is "endogenous."

- Time series and dynamic effects: when we investigate changes in time.

Throughout we will attempt to have a critical approach, trying to assess not only the uses but also the misuses of economic data.

Prerequisites

Economics 3251 or 4351, and Statistics 2500, or equivalent.

Course web page

All course materials, including homework, tests, answer keys, etc., will be available on the Canvas site at: http//courses.missouri.edu.

Important note on course announcements

I will use Canvas for announcements about the class. Some of these may involve important schedule changes. **Make sure that you are getting all announcements**.

Textbook

James H. Stock and Mark W. Watson, *Introduction to Econometrics*, 3rd Edition Updated. This is available at the bookstore.

This course is part of the University's AutoAccess program. You will be able to access the digital content for this course automatically through Canvas, on the first day of class. Your student account will be charged $70.60 for the cost of the digital course material. You will be sent an AutoAccess welcome email that will provide charge amounts, the opt-out process, and any additional information needed for your AutoAccess courses.

Note that you have the option to opt out of this program. Should you choose to do so, <u>you have until February 5, 2019</u>. Once you have opted out, your student account will receive a refund.

If you have any additional questions on the AutoAccess program, please visit <u>www.themizzoustore/autoaccess</u> or email <u>AutoAccess@missouri.edu</u>.

The textbook offers MyEconLab for an additional fee. This is not required, and will not count for the grade. However, you may wish to purchase this program, as it may be useful for practice.

Class participation

You are encouraged to ask and answer questions in class, and generally to participate in the discussion. From my experience, students that engage in the discussion are more likely to do well in my classes. By contrast, I suggest that you be parsimonious with note taking. An old joke is that the class material often goes from the instructor's blackboard to the student's notebooks without passing through the minds of either of them!

Graduate credit

For credit in Economics 7371, you must do the same work as the undergraduate students, plus write a report on econometric techniques used in one published economics paper.

Simply pick any economics paper that has an econometric analysis (regressions, etc.). Any economics paper that uses some of the econometrics techniques learned in class is acceptable (if in doubt, please ask me). Then write a report critiquing the methodology of the paper. For example, can you think of an omitted variable bias that the author(s) failed to consider? More generally, do you think the results have internal validity? How about external validity? You can do this in a very brief way: a 1 to 2-page report is enough.

Requirements and Grading

If your total points ≥	Your guaranteed grade is:
90%	A-
80%	B-
70%	C-
60%	D-

NOTE: grades will be awarded with + / -.

There will be several problem sets and about three empirical exercises. There will be two in-class midterm tests, and one final exam. Your final grade will be weighted as follows:

	Econ 4371	Econ 7371
Problem sets	5%	5%
Empirical exercises	10%	10%
Midterm test 1	25%	25%
Midterm test 2	25%	25%
Final exam	35%	30%
Paper report		5%

Important: in marginal cases I will use your class participation to decide your grade.
Notes on the requirements:
- There will be about nine homework sets. These will consist of a combination of Problem Sets and Empirical Exercises. Details will be given in class.
- You are strongly encouraged to work in groups in the homework sets. I will explain the advantages of doing so in class.
- The tests and final exam will test your comprehensive understanding of all aspects of econometrics: *theory*, *application*, and *interpretation*. A sample test will be made available.

Policy on Make-Up Tests

Make-up tests will be for true and certified (i.e., by a doctor) emergencies only. Having to attend your cousin's wedding is not an emergency! All make-up tests will consist of an oral exam with the instructor.

Academic Integrity

Academic integrity is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. Breaches of the academic integrity rules are extremely serious matters, and may imply sanctions.

Students with Disabilities

If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please establish an accommodation plan with the Disability Center (disabilitycenter.missouri.edu, S5 Memorial Union, 573- 882-4696), and then notify me of your

eligibility for reasonable accommodations. For other MU resources for persons with disabilities, visit ada.missouri.edu.

Intellectual Pluralism

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the Departmental Chair or Divisional Director; the Director of the Office of Students Rights and Responsibilities (http://osrr.missouri.edu/); or the MU Equity Office (http://equity.missouri.edu/), or by email at equity@missouri.edu. All students will have the opportunity to submit an anonymous evaluation of the instructor(s) at the end of the course.

Academic Inquiry, Course Discussion and Privacy

University of Missouri System Executive Order No. 38 lays out principles regarding the sanctity of classroom discussions at the university. The policy is described fully in Section 200.015 of the Collected Rules and Regulations. In this class, students may not make audio or video recordings of course activity, except students permitted to record as an accommodation under Section 240.040 of the Collected Rules. All other students who record and/or distribute audio or video recordings of class activity are subject to discipline in accordance with provisions of Section 200.020 of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters.

TENTATIVE SCHEDULE OF CLASSES

DATES	TOPICS	READINGS / NOTES
January 23	Review of probability	Chapter 2
January 28	Review of statistics	Chapter 3
January 30, February 4, 6	Linear regression with one regressor	Chapter 4
February 11, 13	Hypothesis tests and confidence intervals	Chapter 5
February 18	Introduction to data analysis using STATA	"Introduction to STATA," to be handed out (also posted on Canvas)
February 20, 25, 27	Multiple regressors	Chapter 6. Class on February 16 (on omitted variable bias) is the most important class of the semester. Do not miss it!

DATES	TOPICS	READINGS / NOTES
Monday, March 4	**Test 1** **(in class, unless otherwise announced)**	Test to include (<u>very</u> approximate % weights): • Chapters 2 and 3 (20%) • Chapter 4 (30%) • Chapter 5 (20%) • Chapter 6 (20%) • STATA (10%)
March 6, 11	Hypothesis tests and confidence intervals with multiple regressors	Chapter 7
March 13, 18	Nonlinear regression functions	Chapter 8
March 20, April 1	Panel Data	Chapter 10
April 3	Assessment of regression studies	Chapter 9
Monday, April 8	**Test 2** **(In class, unless otherwise announced)**	Test to include (<u>very</u> approximate % weights): • Chapter 7 (30%) • Chapter 8 (30%) • Chapter 10 (25%) • Chapter 9 (15%)
April 10, 15, 17	Binary Dependent Variable	Chapter 11
April 22, 24, 29	Instrumental Variables	Chapter 12
May 1, 6, 8	<u>Time permitting</u>: Introduction to Time series	Chapter 14
Tuesday, May 14, 10:00 a.m.-12:00 p.m.	**FINAL EXAM** **(In the usual classroom, unless otherwise announced)**	**The final exam is <u>cumulative</u>, with the following exceptions:** • **Probability and statistics not tested.** • **The material after test 2 will be overweighted.**