

University of Missouri – Columbia

**Summer 2022
(June 6 to July 29)**

Economics 4371, 7371: Introductory Econometrics

Syllabus

Instructor: Vitor Trindade (trindadev@missouri.edu)

Office Hours: Wednesday, 1-2 pm (use Zoom link under “Zoom UMSystem,” in Canvas); or by appointment (send an email to make an appointment).

Time Zone: all times (including test times) are in U.S. Central Standard Time.

COURSE OVERVIEW

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

This course is a rigorous and comprehensive introduction to Econometrics. A course like this should therefore 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 along 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 that a certain event will occur?
- Instrumental variable techniques, used when data is “endogenous.”
- Time series and dynamic effects: when we investigate changes in time.

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

THIS IS AN INTENSIVE COURSE

This is important to note! In this course, you are getting credit for a full semester course. In a regular semester, we'd have 15 weeks of instruction, plus the exam week, for a total of 16 weeks. In this Summer course, all content is compressed into 8 weeks only, meaning that the course will be delivered at double speed. In particular, I will post two units (as opposed to just one) at the beginning of each week. Note that this was already a very substantial course to begin with (the course you are taking is adapted from the one I taught in the Spring 2021 semester). For these reasons, make sure that you are able to commit double of the time per week that you would normally commit to a course like this in a regular semester!

LEARNING OBJECTIVES

Upon successful completion of the course, you will be able to:

- know how to choose among several of the most well-known econometric models in order to perform economic analysis using data;
- be critical about data problems that economists are likely to face in practice, and be knowledgeable about some of the methods used to overcome them;
- use a statistical package to analyze data.

COURSE EXPECTATIONS

This is a technology-enhanced course, delivered entirely through the internet. This technology provides you with many benefits, in terms of flexibility and access. But it does put the burden on each student to keep up with the material. To enhance your learning, and help you successfully achieve the Learning Objectives above, you are expected to perform the following duties:

- Your first task is to read this syllabus in its entirety!
- There will be one class module per unit, clearly delineating your tasks for that unit. They will be a combination of: watching lecture videos; do homework sets; do an empirical exercise; and others. You must access the course (through Canvas, see below) often, and at least twice each unit. This will allow you to keep up with all course announcements, and with all new materials.
- As you will see, I will often suggest that you to pause the instruction videos to think about a question by yourself. Do so! This is a great way to watch the video actively, and to check your understanding of the class so far.
- Please enter all online work (homework sets, online quizzes, and tests) promptly and before the due date. Extensions will be given for *certified* emergencies only, and with proper documentation (such as a doctor's note).
- I will be forming Study Groups right at the beginning of the semester. This is not a requirement per se, but you are strongly advised to join one! My experience indicates that students value the experience of studying this class with the help of a study group.

PREREQUISITES

Economics 3251 or 4351, and Statistics 2200 or 2500, or equivalent.

ONLINE ACCESS

You will be able to access all course content through your Canvas account, found here: <https://canvas.umsystem.edu/>. If you haven't already done so, please take a few minutes to familiarize yourself with the Canvas site. If you run into any technical issues, by all means feel free to ask me, but note that the university has a lot of technical support, which can be found here: <https://doit.missouri.edu/tech-support/>.

PANOPTO

Lectures will be delivered through videos using the Panopto service. These videos are a joint copyright of the instructor and the Curators of the University of Missouri. You can view them and download them to be viewed in a mobile device, but you cannot share them with anyone in any form. Sharing them or posting them to other websites, including YouTube, Facebook, or any other site without express, written permission, may result in disciplinary action and possible prosecution.

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*, 4th Edition.

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. You will be sent a welcome email from the Mizzou Store providing charge amounts, the opt-out process and

any additional information needed for your AutoAccess course(s), before the beginning of classes. For any additional questions on the AutoAccess program, email AutoAccess@missouri.edu or visit www.themizzoustore/autoaccess.

Important: If you do opt out, you must purchase separate access to MyLab. MyLab will be used extensively throughout the course, and your work on it will count for the grade.

TESTS

There will be two midterm tests and one final cumulative exam. The three testing periods are:

Test 1 – at the end of the 4th unit

Friday, June 17, 10 am, to Saturday, June 18, 10 pm

Test 2 – at the end of the 10th unit

Friday, July 8, 10 am, to Saturday, July 9, 10 pm

Final – at the end of the semester

Friday, July 29, 10 am, to Saturday, July 30, 10 pm

The final exam is cumulative, except that:

- Probability and Statistics are not tested.
- Material after test 2 is overweighted.

POLICY ON MAKE-UP TESTS

Given that the test dates were announced months ahead of time, and that you have a 36-hour window, make sure that you manage your schedule (your work, your other classes, and any other activities) in such a way that you have time to prepare for, and to take, the tests, within the allowed window.

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! At the discretion of the instructor, make-up tests may consist of an oral or a written exam.

CLASS PARTICIPATION

There are several ways to participate in class, but the main ones are: the discussion forum, my office hours, my email, and the study groups. You are encouraged to ask and answer questions in the discussion forum, and this may be the best way to interact in the class. From my experience, students that engage in the discussion are more likely to do well in the class.

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 econometric analysis (regressions, etc.). Any economics paper that uses some of the econometrics techniques learned in class is acceptable, as long as it is published in a reputable economics journal (if in doubt, please ask me). Read the paper, then write a report critiquing its methodology. For example, can you think of an omitted variable bias that the author(s) failed to consider? 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

Besides the tests, there will be several problem sets and empirical exercises, and, for graduate students, a graduate paper. Furthermore, you are required to post at least one substantive question in the discussion forum, and reply substantively to at least one question by one of your peers. Note the word “substantive”! Just asking, for example, “when is the test?” does not qualify. From all these requirements, your final average score is calculated according to the following weights:

	Econ 4371	Econ 7371
Problem sets	5%	5%
Empirical exercises	20%	20%
Midterm test 1	23%	20%
Midterm test 2	23%	20%
Final exam	27%	25%
Original post in Q and A Forum	1%	1%
Reply to a post in the Q and A Forum	1%	1%
Paper report		8%

Given this final average score, your guaranteed grade is shown in the following table.

If your final average \geq	Your guaranteed grade is:
90%	A-
80%	B-
70%	C-
60%	D-

NOTE: grades will be awarded with + / -.

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. The academic community regards breaches of the academic integrity rules as extremely serious matters. Sanctions for such a breach may include academic sanctions from the instructor, including failing the course for any violation, to disciplinary sanctions ranging from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, collaboration, or any other form of cheating, consult the course instructor.

ACCOMMODATION OF DISABILITIES

Students with Disabilities: If you anticipate barriers related to the format or requirements of this course, if you have emergency medical information to share with me, or if you need to make arrangements in case the building must be evacuated, please let me know as soon as possible.

If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please establish an accommodation plan with the [MU Disability Center](#), S5 Memorial Union, 573-882-4696, and then notify me of your eligibility for reasonable accommodations. For other MU resources for persons with disabilities, click on “Disability Resources” on the MU homepage.

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](#); the [MU Equity Office](#), or 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 make audio or video recordings of course activity unless specifically prohibited by the faculty member. However, the redistribution of audio or video recordings of statements or comments from the course to individuals who are not students in the course is prohibited without the express permission of the faculty member and of any students who are recorded. Students found to have violated this policy 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.

TITLE IX

University of Missouri policies prohibit discrimination on the basis of race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, pregnancy, age, genetic information, disability and protected veteran status. Discrimination

includes any form of unequal treatment such as denial of opportunities, harassment, and violence. Sex-based violence includes rape, sexual assault, unwanted touching, stalking, dating/interpersonal violence, and sexual exploitation.

If you experience discrimination, you are encouraged (but not required) to report the incident to the MU Office for Civil Rights & Title IX. Learn more about your rights and options at civilrights.missouri.edu or call 573-882-3880. You also may make an anonymous report online.

Students may also contact the Relationship & Sexual Violence Prevention (RSVP) Center, a confidential resource, for advocacy and other support related to rape or power-based personal violence at rsvp@missouri.edu or 573-882-6638, or go to rsvp.missouri.edu.

Both the [Office for Civil Rights & Title IX](#) and the [RSVP Center](#) can provide assistance to students who need help with academics, housing, or other issues.

MENTAL HEALTH

The University of Missouri is committed to supporting student well-being through an integrated network of care, with a wide range of services to help students succeed. The MU Counseling Center offers professional mental health care, and can help you find the best approach to treatment based on your needs. Call to make an appointment at 573-882-6601. Any student in crisis may call or go to the MU Counseling Center between 8:00 – 5:00 M-F. After hours phone support is available at 573-882-6601.

Visit our website at <https://wellbeing.missouri.edu> to take an online mental health screening, find out about workshops and resources that can help you thrive, or learn how to support a friend. Download Sanvello, a phone app that teaches skills and strategies to help you maintain good mental health. Log in with your Mizzou e-mail to unlock all the tools available through Sanvello at no cost to you.

SCHEDULE

UNITS	TOPICS	READINGS / NOTES
1	Review of probability	Chapter 2
	Review of statistics	Chapter 3
2	Linear regression with one regressor	Chapter 4
3	Linear regression with one regressor (continued)	Chapter 4
4	Hypothesis tests and confidence intervals	Chapter 5
5	Introduction to data analysis using STATA	“Introduction to STATA” posted on Canvas
End of 5th Unit	Test 1	Friday, June 17, 10 am to Saturday, June 18, 10 pm
6	Multiple regressors	Chapter 6. The first lecture of this unit (omitted variable bias) is <u>the most important of the class.</u>
7	Multiple regressors (Continued)	Chapter 6
8	Hypothesis tests with multiple regressors	Chapter 7
9	Panel Data	Chapter 10
10	Nonlinear regression functions	Chapter 8
End of 10th Unit	Test 2	Friday, July 8, 10 am to Saturday, July 9, 10 pm
11	Binary Dependent Variable	Chapter 11
12	Instrumental Variables	Chapter 12
13	Instrumental Variables (Continued)	Chapter 12
14	Introduction to Time series	Chapter 15
15	Introduction to Time series (Continued)	Chapter 15
	FINAL EXAM	Friday, July 29, 10 am to Saturday, July 30, 10 pm