University of Massachusetts Amherst
Department of Resource Economics

ResEcon 702 Econometrics I—Spring 2021
TuTh 1:00PM to 2:15PM
Remote Instruction

Professor: Dr. David Keiser
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Office hours: Wednesdays 4pm – 5pm and by appointment.

Course Objective:

This is the second course in our graduate econometrics series. Our focus in this course will be the basic theory and practice of estimating economic relationships. The emphasis will be on linear models. We will focus our attention on the modern use of models in economics and social science research. Nonlinear models will be in taken up in the following course, ResEc 703.

Prerequisites:

As this is the second course in the econometrics series, I will expect working knowledge of the following: Linear algebra; Multivariate calculus; Basic statistical concepts including OLS with a single regressor; STATA (other statistical software packages may be acceptable after checking with me)

If you are lacking one or several of these prerequisites, I suggest taking Res-Econ 701 before this class. If you only need a refresher or have minor gaps, a subject-specific book may be sufficient, but either way it is your responsibility to make sure you have the required background.

Texts

- There is no required textbook for this class. I highly recommend a standard graduate-level textbook for supplementary reading such as Econometric Analysis by William Greene. I will also borrow heavily from a free online textbook by Scott Cunningham at Baylor University (https://mixtape.scunning.com/). Microeconometrics: Methods and Applications by Cameron and Trivedi is also a great resource. An additional easy to follow and fantastic resource is Mostly Harmless Econometrics by Angrist and Pischke.

Software

- I will require that you have access to Stata to complete your homework. If you don't have remote access to the software, a reasonable student version of the software is available here for a 6-month, annual, or perpetual subscription: https://www.stata.com/order/new/edu/profplus/student-pricing/. I require Stata so that I can provide you with helpful programming tips. I also require Stata since you will be required to submit your code for homework assignments.

Grades:

Grades will be calculated according to the following percentages:

	Percentage	**When**
Homework Assignments	65% (lowest one dropped)	Assigned throughout the semester. Approximately 8 in total.
Midterm	35%	TBD
Total	**100%**	

I will use the following grading-scale:

- **A** : 94 – 100; **A-** : 90 – 93
- **B+** : 88 – 89; **B** : 84 – 87; **B-** : 80 – 83
- **C+** : 78 – 79; **C** : 74 – 77; **C-** : 70 – 73
- **D+** : 68 – 69; **D** : 64 – 67; **D-** : 60 – 63
- **F** : < 60

I encourage feedback throughout the semester to make sure my goals and your expectations are being met. I will distribute evaluations mid-semester.

Note on Problem Sets

If you think you have a good reason why you cannot make the specified deadline for a problem set, please discuss with me ahead of time. There will be a deduction of 10 percentage points per day for late submissions. Submissions made after a solution has been posted to Moodle will receive no credit.

Note on the Exams

- The midterm will be take-home.
- Academic Conflict with Exams:
  I will provide a make-up exam only to eligible students according to the university rules. These rules apply to students for whom exams conflict with another exam or class. Please have the Registrar's Office verify the conflict and bring me this verification at least one week before the exam.

Exam Protocol

- The midterm will be closed book.

Virtual Instruction

I will make every effort to deliver a high-quality instructional experience, despite the circumstance of COVID. I plan to employ a number of best-practice suggestions for our class:

-The course will meet synchronously on Tuesdays and Thursdays on Zoom from 1:00pm to 2:15pm during our normally scheduled time. Please try to attend this session, if possible.

-For those that can't make it to lecture, I will record the lectures and post them on Moodle. Transcriptions of these videos will be posted to Moodle. I will also record my notes and make them available through Moodle. This will serve as one asynchronous aspect of the course. Another asynchronous component of the course will include supplementary videos. These videos will focus on coding exercises that will form the basis of homework assignments. These videos will be in digestible, 10-15 minute sessions and posted on Moodle.

-I will also offer office hours once a week for an opportunity to meet and discuss individual questions and concerns. I also offer office hours by appointment.

-If you are struggling to keep up with the class, please reach out as soon as possible. I will work with you to find ways to help overcome obstacles to learning.

Communication Channel:
I make class announcements (assignment due date, exam time and location, class cancellation, etc) using Moodle throughout the semester. It is your responsibility to make sure that your account is activated and that you check it regularly.

Accommodation Statement
The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

Academic Honesty Statement
Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent (http://www.umass.edu/dean_students/codeofconduct/acadhonesty/).

Class Outline:

I would like to cover the topics presented below. Some changes to this brief outline may occur throughout the semester depending how far we get on various topics. Suggested readings will be given in class.

Part 1: The Basics

- Review
- OLS
- Hypothesis Testing
- Error Structure, GLS

Part 2

- Causal Inference and Potential Outcomes

Part 3: Modern Methods

- Data Organization and Cleaning
- Matching
- Instrumental Variables
- Panel Data Models
- Difference-in-Difference
- Regression Discontinuity (If there is time)
- Synthetic Control (If there is time)