ECN 726: Econometrics II
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Arizona State University: Spring 2019

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web: blackboard
office hours: Tuesday, Thursday: 11:45-1:00, CPCOM 455H
lecture: Tuesday, Thursday: 9:00-10:15, CPCOM 416
ta: Juhee Bae
    contact: jbae23@asu.edu
    office hours: by appointment

Course objective:
The objective of this course is for students to develop working knowledge of core econometric methods beyond the linear regression model. Topics will include panel data, instrumental variables, nonlinear estimators, numerical methods for maximization and integration, discrete choice models, selection, and program evaluation.

Required textbooks:
Cameron and Trividi, Microeconometrics: Methods and Applications
Train, Discrete Choice Methods with Simulation

Other useful references:
Amemiya, Advanced Econometrics
Corbae, Stinchcombe, and Zeman, Mathematical Analysis for Theory and Econometrics
Davidson & MacKinnon, Econometric Theory and Methods
Hall, Generalized Method of Moments
Judd, Numerical Methods in Economics
Manski, Identification for Prediction and Decision
Miranda and Fackler, Applied Computational Economics and Finance
Wooldridge, Econometric Analysis of Cross-Section and Panel Data
NBER econometrics lectures: https://nber.org/SI_econometrics_lectures.html
Prerequisites: ECN 725 or the equivalent. All students must be proficient with the first-semester Ph.D. level treatment of matrix algebra, probability theory, the multivariate linear regression model.

Grading:

There will be a midterm exam, several problem sets, and a term project. They will be weighted as follows:

- Midterm: 25%
- Problem sets: 40%
- Term project: 25%
- Project presentation: 10%

Midterm:

The midterm will be a 24-hour take-home exam. All work must be done independently. Any form of cooperation will be treated as a violation of the Graduate Honor System and handled according to University policy.

Problem Sets:

You are welcome to form study groups to work on them together. However, each student must turn in assignments written in their own words, as well as original computer code, when applicable. Violations of this rule will be treated as violations of the Graduate Honor System and handled according to University policy.

Each problem set will have 100 points. The cost of submitting an assignment past the deadline is 10 points per 24-hour period.

Assignments must be typed.

Assignments will be submitted by email to Juhee.

Software:

We will be using MATLAB software to develop Monte Carlo simulations and estimate econometric models. You will need access to MATLAB to complete the problem sets, midterm, and term paper. Students can access MATLAB through the University app page. If you prefer to work without an internet connection you can purchase a permanent license (http://www.mathworks.com/academia/student_version/).

1 We will also be using the statistics and optimization toolboxes. They are incorporated into the University’s version of the software as well as the student version of the software sold by Mathworks.
General Guidelines for the Term Project:

The objective is to replicate and extend a recent econometric study (published in 2017 or later) and then produce a well written description of your findings. Possible extensions include (but are not limited to) Monte Carlo simulation of estimators, alternate model specifications, alternate estimation strategies, robustness checks, and estimation following additional data collection. I encourage you to view this project as an opportunity to begin exploring areas of potential interest for future dissertation research.

The text, equations, tables, and figures of the term paper should be presented in the format and style used in journals such as *Econometrica*, the *Review of Economics and Statistics* or the *Journal of Econometrics*. The paper should be clearly organized into sections. **At a minimum**, your paper must include:

1. **Introduction.** Clear statement of the question being asked in the original paper and why it is of interest, followed by a clear description of your extensions and why they are of interest.

2. **Model Specification.** Formal description of the key economic and statistical properties of the original model and your extensions to it. Describe any hypotheses you intend to test and carefully explain the economic implications for your model.

3. **Data.** Summary of where the data originated, how they were collected, variable definitions, and summary statistics.

4. **Results.** Summary of your effort to replicate the authors’ original results, followed by a detailed description of the results from your extensions to their study, including tables of the estimated parameters and your interpretation of their economic implications.

5. **Conclusions.** Your summary assessment of the economic implications of your econometric extensions and logical next steps for further research.

You are required to submit electronic copies of the data and code required to replicate all of your results. You must label your code so that I can easily match it to the results reported in the original paper’s tables, as well as the tables in your paper. This requirement mirrors the replication policy for articles published in most leading economics journals.

**Project Presentation**

At the end of the semester you will give a 15-minute “egg timer” presentation on your findings.

**Deadlines**

A one-page proposal is due by Friday, March 1st. It must describe the paper you intend to replicate and your proposed extensions to the econometric analysis.

The term paper is due at 8am on Friday, April 26th. I will not consider requests for deadline extensions. I will not give grades of incomplete.

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2 Many economic journals have online “supplemental material” archives that will allow you to download the data used in published papers from the journal webpage. Examples include *Econometrica*, the *American Economic Review*, the *Journal of Business and Economic Statistics*, and the *Journal of Applied Econometrics*. However, data are not posted when they are proprietary and only shared with researchers on a confidential basis under data use agreements. This situation is common. You must verify that the data needed to replicate your paper are fully available.
# Tentative Course Outline

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**Note:** additional readings from the list below will be assigned prior to individual lectures
Tentative Reading List
(note: all papers will be posted on Blackboard)

I. INTRODUCTION


II. LINEAR ESTIMATION: INSTRUMENTS & PANEL DATA


III. NONLINEAR ESTIMATION


IV. DISCRETE CHOICE AND HETEROGENEITY


V. SELECTION AND PROGRAM EVALUATION


