Syllabus:
ECON 6200 – Econometrics II (Spring 2025)

Instructor

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Summary

This course will provide you with the toolkit to understand why and when the fundamental statistical tools used in economics work, including the ability to extend such analysis to novel scenarios. While all methods covered are ultimately motivated by applications, the focus is on theoretical understanding and on generality (and thereby transferability).

The first part of the course moves up in generality from OLS to IV to GMM to m- and extremum estimation and down again to Maximum Likelihood. Special cases will include a cursory look at panel data. We will also look at first principles of non- and semiparametric estimation and of bootstrap inference.

Assessment

There will be about eight homework exercises (30%), a prelim (on March 27th; 30%), and a final (in finals week, i.e. between May 10th and 17th; 40%). The final will emphasize material from later in the semester, but the material is inherently extremely cumulative.

The homework will mix theoretical and practical exercises. You may use any software that does the job, e.g. Stata, R, Julia, Python, or MATLAB. Some of these are freely available, and all others are available through Apps on Demand on Canvas. Teamwork is encouraged, but homework write-ups must be handed in separately. Your weakest homework will be dropped from consideration.

2025 special schedule: Class meeting on Friday, 3/21, will be a lecture. The meeting on Tuesday, 3/25, will be a recitation session.

Course Outline

1. OLS: definition and finite sample properties.
(Hansen ch. 2-5)

2. OLS: Large sample properties in rather general setting.
(Hansen ch. 7)

3. Instrumental Variables and Two-Stage Least Squares.
(Hansen ch. 12)

4. GMM: single and multiple equations. Some panel theory.

5. A careful development of extremum estimation theory. Nonlinear GMM and Maximum Likelihood as special cases. Careful discussion of identification.
(Supplemental reading: Newey-McFadden handbook chapter, Hayashi ch. 7.)

6. Bootstrap inference.
(Horowitz handbook chapter, Politis/Romano/Wolf book chapter, Hansen ch. 10.)

7. Non- and semiparametrics: Kernel density and mean regression, (hopefully) partially linear models. (I will circulate notes.)