Econ 8310   Yulong Wang
Advanced Micro Econometrics   Spring 2025
Syllabus (Tentative)

This course is designed to expose you to the statistical techniques economists use in estimating, testing, and forecasting economic relationships. Successful completion of this course should allow you to read and understand the basic techniques used in the professional empirical literature in economics.

Time and Location: TH 10:15-11:45 AM, Jan 16th – Apr 29th Location TBD

Textbook: Most of the course is designed around detailed notes. These notes will be available on Blackboard. See the reading list for other references.

Grading: problem sets 60%, and the presentation or a term paper worth 40%. We will discuss.

Problem Sets: There will be 3 problem sets, roughly one every month. You can work in groups, 1-4 members (encouraged!).

Exams: The midterm will be in class in the midterm week. For the final, you can choose to submit a term paper (topic related to this course) or present the paper in the last class. Depending on how many of you select the presentation, we will arrange one or more lectures at the end of the semester.

Office Hours: TBA.
I can be reached by e-mail at ywang402@ syr.edu.

Topical Outline

1. Extremum Estimator — the course begins with econometric analysis with commonly used methods, such as OLS, GMM, MLE, etc. Consistency and asymptotic normality are rigorously considered.

2. Covariance Estimation and Bootstrap – Estimation of the standard error is discussed. When this is very complicated, bootstrap serves a very good alternative.

3. Discrete choice — this section discusses discrete choice models, which are widely used in micro econometric analysis. We will also cover demand estimation using BLP, which is the state-of-the-art method in IO.

4. Nonparametric Method — Kernel estimation is introduced. Consistency, asymptotic normality, and the choice of bandwidth are discussed.

5. Semiparametric Method — Partial linear models, single index models, kNN, and series estimators are introduced.

6. Extreme Value Theory — Focus on extreme values, outliers, sample maximum etc. Derive non-Gaussian asymptotic distributions and discuss applications in economics.

7. Treatment Effect — Introduce the classic Roy model for causal inference. Identify and estimate the average treatment effect. Difference-in-difference estimators.