

## Econ 5300: Econometrics

Instructor: Prof. Songnian Chen

Office: Room 6007

Office Hours: Thursday 10:00-11:30 or by appointment

### References:

Hayashi F.: Econometrics

Hansen H.: Econometrics: <http://www.ssc.wisc.edu/~bhansen/econometrics/>

Greene W.: Econometric Analysis

Wooldridge J.: Econometric Analysis of Cross Section and Panel Data

Stock J.H. and M.W. Watson, Introduction to Econometrics

Verbeek M: A Guide to Modern Econometrics

Angrist and Pischke: Mostly Harmless Econometrics

**Course Description:** This course provides a reasonably rigorous approach to the estimation and inference related to the general linear regression model, systems of regression models as well as panel data models. The materials covered will be very useful for doing empirical research. A brief review on matrix algebra and statistical inference will be conducted, but a basic knowledge of these materials is needed.

**Intended Learning Outcomes:** Upon completion of this course, the student is expected to possess a solid theoretical foundation and practical knowledge in econometrics, and will be able to carry out empirical research competently in economics, finance, accounting and other areas in business and social science, with econometrics skills acquired in this course.

**Teaching Approach:** This course is primarily delivered through lectures, which focus on key concepts. The lectures are complemented by homework assignments.

### Assessment:

**Class Attendance:** Keep your camera on during the class.

### Course Outline:

1. Matrix Algebra and Statistics Review
2. The Classical Linear Regression Model
  - Statistical Properties of the Least Squares Estimator
  - Hypothesis Testing with the Multiple Regression Model
  - Asymptotic Properties of the OLS Estimator

- Model Specification
3. Extensions of the Classical Regression Model
    - Heteroskedasticity and Autocorrelation
  4. Endogeneity and Instrumental Variable Estimation
  5. Generalized Method of Moments
    - Generalized Method of Moments
    - Hypothesis Testing with GMM
  6. Panel Data Models
    - Fixed effects Model
    - Random Effects Model
  7. Clustering Analysis
  8. Difference-in-Differences Analysis
  9. Additional Topics