Econometrics 675:
Fundamental Statistics for Economists. August 2017

Instructor: Qi Li

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Office Hour:

This course studies basic probability and statistics theories and their applications in econometrics. We will first study some basic probability theories covering random variables, probability space, expectation, variance and covariance, and rules of computing probabilities. We then study some basic statistical theory including sampling theory, estimation and hypothesis testing. In additional to these probability/statistics topics, we will discuss linear regression models using matrix notations, derive the finite sample, as well as asymptotic, properties of the least squares estimators. We will also briefly discuss nonlinear regression regression models, and maximum likelihood estimation method if time permits.

Homework problems will not be collected, answers to some of homework questions will be discussed in classes or review sections.

Grade: Your grade will be determined by an exam on August 25, 2017 (8:30-10:30am at Allen 1006).

Text book

This course is mainly based on handout, it is self-contained.

Reference books

Statistical Inference (2nd ed.), by George Casella and Roger L. Berger (Buxbury advanced series) can be used as a reference book for the first half of the course.

Econometrics Analysis (Any edition) by Williams Greene. The chapters on linear regression model (using matrix) and the chapters on maximum likelihood estimation.

Course Outline

Part I. Probability Theory

1. Basic Probability.
2. Univariate Random Variables and Probability Distributions.
3. Examples of Univariate Distributions.
4. Multivariate Random Variables and Probability Distributions.

Part II. Statistical Theory

We will skip this part.

Part III. Regression Models

8. Linear Regression Models
9. Nonlinear Regression Models (with Appendix A: Asymptotic Theory)
10. Maximum likelihood estimation method
11. Time series econometric models

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