ECON 577: Topics in Econometrics

University of Illinois at Urbana-Champaign
College of Liberal Arts & Sciences
Department of Economics

EunYi Chung
222 David Kinley Hall

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M & W, 2pm-3:20pm

Communication:
Office: 220 David Kinley Hall
Office Phone: 217-300-4511
E-mail: eunyi@illinois.edu
Office Hours: Mondays 3:20-4:20pm
Or by appointment

Prerequisites:
Students should be familiar with basic probability and statistics, including elementary large sample theory.

Course Description:
The goal is to develop sufficient tools and methods to be able to read current econometrics literature. You will learn modern statistical concepts and methods developed in a mathematical framework, mostly large sample theory, approximations and efficiency.

Texts:

Recommended texts are

• Testing Statistical Hypotheses (2005) by Lehmann and Romano
• Asymptotic Statistics (2000) by van der Vaart

Grading:
There will be a few problem sets throughout the semester, one of which may be a referee report exercise. There will be student presentations and possibly a take-home final exam.
Course Topics:

A tentative list of topics that we will cover is listed below. There may be additions and deletions. Note that many of these topics could be entire courses in and of themselves, so our coverage will be necessarily incomplete.

1. Large Sample Theory
2. U-Statistics
3. Asymptotic Comparisons of Tests
   (a) Local Asymptotic Power
   (b) Comparison of the Sign Test and t-test
   (c) Contiguity and the Wilcoxon Signed Rank Test
   (d) Asymptotically Normal Experiments
4. Asymptotic Comparisons of Estimators
   (a) Superefficiency and Hodges’ Estimator
   (b) Efficiency of Maximum Likelihood Estimators
5. Uniform Law of Large Numbers
   (a) The Glivenko-Cantelli Theorem
   (b) Some Generalizations
6. General Large Sample Methods
   (a) Randomization Tests/ Permutation Tests
   (b) Bootstrap
   (c) Subsampling
7. Uniformity
   (a) Pointwise versus Uniform Consistency in Level
   (b) The Bahadur-Savage Result
8. Multiple Testing
   (a) The Familywise Error Rate
   (b) Single-Step Procedures
   (c) Stepwise Procedures
   (d) Generalized Error Rates