Econ 870
Advanced Econometrics
Fall 2015

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Office Hours: Wednesday 10 am - noon and by appointment in Gardner 300E

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Recitation: F 09:00 - 10:15 am in Gardner 210

Prerequisite:
The pre-requisites are Econ 770 and Econ 771. BOTH are required.

Course description:
The aim of this course is to give students more in-depth views of econometric models and a firm understanding of econometric theory. The lecture broadly consists of three parts: identification, classical estimation methods and their asymptotic properties, and modern inference techniques.

Grading:
Your final grade will be based on: three midterm exams (10+10+10=30%), final exam (50%), and problem sets (20%). Problem sets will be assigned every week. If you miss a midterm exam for a medical or family emergency,

Textbook:
There is no required textbook for this course. The following two books, however, are highly recommended to read:
(CT) "Microeconometrics" by Colin Cameron and Pravin Trivedi.
(W) "Econometric Analysis of Cross Section and Panel Data" by Jeffrey Wooldridge

Recommended supplemental reading:

(A) "Advanced Econometrics" by Amemiya (Harvard University Press 1985)
(AAI) "Instrumental Variables Estimates of the Effect of Subsidized Training on the Quantiles of Trainee Earnings" by Abadie, Angrist and Imbens, Econometrica, 2002.
(Aba) "Bootstrap Tests for Distributional Treatment Effects in Instrumental Variable Models" by Abadie, Journal of the American Statistical Association, 2002.
(CH) "An IV Model OF Quantile Treatment Effects" by Chernozhukov and Hansen, Econometrica 2005

(DH) "Bootstrap Methods and Their Application" (Cambridge Series in Statistical and Probabilistic Mathematics) by A. C. Davison and D. V. Hinkley.

(FMP) "Econometric Modeling and Inference" by Florens, Marimoutou and Peguin-Feissolle. (Translated by: J. Perktold and M. Carrasco)

(Ha) "Econometrics" by B. Hansen (draft graduate textbook), http://www.ssc.wisc.edu/~bhansen/econometrics/

(HIR) "Efficient Estimation of Average Treatment Effects Using the Estimated Propensity Score" by Hirano, Imbens, and Ridder, Econometrica, 2003.

(Ho) "The Bootstrap in Econometrics", by J. Horowitz, in Handbook of Econometrics, Vol. 5, ch. 52, J.J. Heckman and E.E. Leamer, eds., Elsevier Science. and James MacKinnon, same title, Economic Record, or available as http://www.econ.queensu.ca/working_papers/papers/qed_wp_1028.pdf

(IA) "Identification and Estimation of Local Average Treatment Effects" by Imbens and Angrist, Econometrica, 1994.

(LR) "Nonparametric Econometrics: Theory and Practice" by Li, Racine, (Princeton University Press 2006)

(Man) "Identication for Prediction and Decision," by Manski (Harvard University Press 2007)

(Mat) Matzkin, R. "Nonparametric Identification in Structural Economics Models," Annual Review of Economics, http://www.econ.ucla.edu/people/papers/Matzkin/Matzkin616.pdf

(NM) Newey, W. K. and McFadden, D. "Large Sample Estimation and Hypothesis Testing," Handbook of Econometrics, Volume 4, 1994.

Course outline and exams
(Class contents may change during the course of the semester. However, exam dates will not change)

1. Review of Linear and Nonlinear Models
- Projection theory
- Linear model
- Nonlinear model
Suggested Reading: (Ha: Ch 2,3,4,7)

2. Identification
2.1. Parametric Identification
- Without endogenous regressors
- With endogenous regressors
2.2. Nonparametric Identification
- Additively separable models
- Nonseparable models

Midterm 1: Sep. 22

2.3. Identification in Program Evaluation
- Randomized experiment and selection on observables

- Instrumental variables approach: Local treatment effects, control function, rank similarity
Suggested Reading: (Man), (Mat), (HIR), (IA), (Aba), (AAI), (CH), and many other papers announced in class

3. Elementary Asymptotic Theory (3 lectures)
Lecture notes

4. Extremum Estimators (8 lectures)
- Review of GMM, NLLS, and MLE
- Consistency

Midterm 2: Oct. 20

- Asymptotic normality
- Testing
- Two-step estimation
- Quantile regressions
Suggested Reading: (W: Ch. 12-14), (H, Ch. 7-8), (NM)

5. Bootstrap (3 lectures)
- Inference using the bootstrap
- Failure of the bootstrap

Suggested Reading: (DH), (Ho), (Ha: Ch. 10)

Midterm 3: Nov. 10

6. Nonparametric Estimation (3 lectures)
- Kernel density estimation
- Nonparametric regression

Suggested Reading: (LR: Ch. 1), (Ha: Ch. 11)

Final: Dec. 8

Classroom etiquette:
To maintain a classroom environment as a good learning environment for everyone, you must turn off all cell phones, laptops, and other electronic devices during class.