Econometric Theory II: NonLinear Models
Spring 1996

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This course is intended for advanced (2nd year) graduate students in economics. The design is to give a foundation for modern econometric theory. Prerequisites are ECO 727 and 728.

Grades for the course will be based on assignments (40%), midterm (30%), and final (30%).

The book whose material most closely matches the subject matter of the course is


For the central asymptotic theory, the following books are very useful, and have been put on reserve at the library:


The following syllabus outlines the subject matter for the course.

Recommended readings are starred (*).
1: Asymptotic Theory

1.1 Random Sampling, Heterogeneity and Weak Dependence

* White (1984)

1.2 Consistency and the Central Limit Theorem

Amemiya, chapter 3.


* Davidson and MacKinnon, Chapter 4

1.3 Linear Regression and Covariance Matrix Estimation


2: Estimation in Non-Linear Models

2.1 Maximum Likelihood Estimation

Davidson and MacKinnon, Chapters 8, 9

2.2 Non-Linear Optimization

2.3 Asymptotic Theory

* Amemiya, chapter 4.


* Davidson and MacKinnon, Chapters 4, 5.

Gallant and White (1988)

2.4 Non-Linear Least Squares

Davidson and MacKinnon, Chapters 2, 3, 4, 5.

2.5 Quasi-MLE


2.6 Least Absolute Deviations


2.7 Generalized Method of Moments

* Davidson and MacKinnon, Chapter 17.


2.8 Two-Step Estimators


3: Testing

3.1 Classical Tests: Wald, LR and LM


* Davidson and MacKinnon, Chapters 11, 12,13.

3.2 Hausman Tests

3.3 Conditional Moment Tests


3.4 Chi-Square Tests


3.5 Non-Standard Problems

Andrews and Ploberger *Econometrica* (1994) "Optimal Tests when a nuisance parameter is present only under the alternative," 1383-1414.

4: Topics in Computational Methods

4.1 The Bootstrap

Efron, B. (1982) *The Jackknife, the Bootstrap and Other Resampling Plans*, SIAM.


Peter Hall (1992) *The Bootstrap and Edgeworth Expansion*

4.2 The EM algorithm and the Gibbs Sampler


4.3 Randomization Methods
