University of Colorado - Department of Economics
Econ 8828 - Seminar in Econometrics - Fall 2017
Professor Carlos Brunet Martins-Filho

Office. Economics Building 105

Meetings. Tuesdays and Thursdays from 9:30 AM - 10:45 AM in ECON 5.

Office hours. Thursdays 2:00 PM - 3:30 PM and by appointment. For appointment send an email to carlos.martins@colorado.edu.

Class URL. http://spot.colorado.edu/ martinsc/Econ_8828.html

Prerequesites. ECON 7828 (or equivalent) or consent of instructor.

Objectives. This is the first course of the sequence Econ 8828-8838. This sequence is the core of a Ph.D. field in Econometrics. The course objectives are:

to introduce you to the fundamental tools and concepts from probability theory needed for a rigorous study of the limiting properties of estimators for parametric and nonparametric statistical/econometric models

to provide a general asymptotic characterization of a broad set of parametric estimators commonly used in econometrics, including method of moments, minimum distance, least squares and maximum likelihood.

to introduce you to nonparametric estimators for density and regression

Grades. Your course grade depends on four homework sets and a final examination. Relevant dates are given below.

Evaluation	Points	Date
Homework sets	70	TBA in class
Final examination	30	December 16, 1:30 PM - 4:00 PM

Support and Reference Books.

A. Mathematics, Probability and Asymptotic Theory

1. Apostol, T., 1974, Mathematical Analysis, Addison Wesley, New York.
2. Bartle, R., 1966, Elements of Integration, John Wiley and Sons, New York.
3. Davidson, J., 1994, Stochastic Limit Theory, Oxford University Press, Oxford.
4. Dhrymes, P., 1989, Topics in Advanced Econometrics: Probability Foundations, Springer Verlag, New York.
5. Grimmett, G.R. and D.R. Stirzaker, 1992, Probability and Random Processes, Oxford University Press, Oxford.
6. Jacod, J. and P. Protter, 2000, Probability Essentials, Springer, Berlin.

7.

(e) Product spaces and joint measures

(f) Conditional expectation

(g) Radon-Nikodym derivative

4. Convergence

(a) Almost sure convergence

(b) Convergence in probability

(c) L_p convergence

(d) Uniform integrability

(e) Moment inequalities: Schwartz's, Hölder's, Minkowski's, Jensen's, Lyapounov's

(f) Convergence in distribution

i. Sche e's Lemma

ii. Skorohod's Theorem

iii. Delta method and the Continuous Mapping Theorem

iv. Characteristic functions: uniqueness and continuity theorems

v. Portmanteau Theorem

(g) Weak Law of Large Numbers for IID sequences

(h) Central Limit Theorem for IID sequences

(i) Convergence of Moments

(j) Lindeberg-Feller Theorem

5. Parametric models

(a) Identi cation

(b) Loss functions and Extremum (M) estimation

i. Linear and nonlinear least squares (LS)

ii. Maximum likelihood (ML)

iii. Method of moments (MM)

iv. Minimum distance (MD)

(c) Z-estimation

(d) Consistency: LS, ML, MM, MD

(e) Stochastic equicontinuity and uniform convergence

(f) Asymptotic Normality: LS, ML, MM, MD

(g) Estimation of Covariances of Asymptotic Distributions

(h) Asymptotic E ciency

(i) Feasible estimation

(j) Two-Step estimation

6. Hypothesis testing for parametric models

(a) Basic concepts: level, asymptotic power functions, relative e ciency

(b) Likelihood ratio tests

(c) Wald and Score tests

7. Nonparametric and semiparametric models

(a) Kernel density and distribution estimation

(b) Kernel regression estimation

(c) Partially linear regression models