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, Holder'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

Important information.

If you qualify for accommodations because of a disability, please submit a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail dsinfo@colorado.edu.

If you have a temporary medical condition or injury, see Temporary Medical Conditions: Injuries, Surgeries, and Illnesses guidelines under Quick Links at Disability Services website and discuss your needs with me.

Campus policy regarding religious observances requires that faculty make every e ort to reasonably and fairly deal with all students who, because of religious obligations, have con icts with scheduled exams, assignments or required attendance. In this class, if the midterm, nal or homework due dates prevent/inhibit you from exercising your rights to religious observance, please inform me by August 28, 2012 so that reasonable accommodations can be made.

See full details at www.colorado.edu/policies/fac_relig.html.

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with di erences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may