

University of Colorado - Department of Economics  
Econ 8838 - Econometrics Seminar 2 (3 credits)  
Professor Carlos Martins-Filho

Office. Economics Building 105

Meetings. MW 9:00 AM - 10:15 AM in Econ 5.

Office hours. W 4:30 PM - 6:00 PM and by appointment. For appointment email [carlos.martins@colorado.edu](mailto:carlos.martins@colorado.edu).

Class URL. [http://spot.colorado.edu/~martins/ECON\\_8838.html](http://spot.colorado.edu/~martins/ECON_8838.html)

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

**Course description and objectives.** This is a course on parametric/nonparametric modeling of dependent processes. The main objective is to introduce you to a suitable set of models, estimation and testing procedures that can accommodate dependence. This introduction involves a theoretical treatment of the models, estimators and testing procedures. This will involve a careful study of asymptotic theory.

**Grades.** Your course grade will be calculated from grades on a midterm, several homework sets and a final examination.

Evaluation	Points	Date
Homework sets	40	TBA in class
Midterm	25	2.29.12
Final	35	5.5.12 from 4:30 PM - 7:00 PM

**Books.** During the course I will refer to several books and articles. All are available from me on a two-hour or overnight loan. They are:

1. Apostol, T., 1974, *Mathematical Analysis*, Addison Wesley, New York.
2. Bartle, R., 1966, *Elements of Integration*, John Wiley and Sons, New York.
3. Bosq, D., 1998, *Nonparametric Statistics for Stochastic Processes*, Springer-Verlag, New York.
4. Brockwell, P. J. and Davis, R. A., 2006, *Time Series: Theory and Methods*, Springer, New York.
5. Davidson, J., 1994, *Stochastic Limit Theory*, Oxford University Press, Oxford.
6. Fan, J. and Q. Yao, 2003, *Nonlinear Time Series*, Springer Verlag, New York.
7. Grimmett, G.R. and D.R. Stirzaker, 1992, *Probability and Random Processes*, Oxford University Press, Oxford.
8. Jacod, J. and P. Protter, 2000, *Probability Essentials*, Springer, Berlin.
9. Li, Q. and J. S. Racine, 2007, *Nonparametric Econometrics: Theory and Practice*, Princeton University Press, Princeton.
10. Luenberger, D., 1969, *Optimization by vector space methods*. John Wiley and Sons, New York.

11. van der Vaart, A., 1998, *Asymptotic Statistics*, Cambridge University Press, Cambridge.
12. White, H., 2001, *Asymptotic Theory for Econometricians*, Academic Press, San Diego.
13. I will distribute class notes. Read them carefully. They reflect my view of the most important concepts/theorems we cover in the course.

### Topics.

1. Stochastic processes
  - Kolmogorov's theorem
  - Stationarity
  - Autocovariance and Autocorrelation functions
  - Multivariate Gaussian distribution
2. Stationary ARMA processes
  - Conditional expectations
  - Wold's theorem
  - Prediction and forecasting
  - Estimators and asymptotic properties
3. ARCH and GARCH processes
  - Properties
  - Estimators and asymptotic properties
  - A collection of extensions
4. Nonparametric modeling
  - Kernel density estimation
  - Mixing
  - Nonparametric autoregression
  - Local polynomial estimation
5. Additive models
  - Identification and estimation
6. Nonparametric estimation of conditional variance
7. Model testing and selection
8. Nonlinear prediction

### Important information.

- If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and [www.colorado.edu/disabilityservices](http://www.colorado.edu/disabilityservices).

- Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, if the two midterm, final or homework due dates prevent/inhibit you from exercising your rights to religious observance, please inform me by August 28, 2009 so that reasonable accommodations can be made. See full details at [www.colorado.edu/policies/fac\\_relig.html](http://www.colorado.edu/policies/fac_relig.html)
- Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty has the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. See policies at [www.colorado.edu/policies/classbehavior.html](http://www.colorado.edu/policies/classbehavior.html) and at [www.colorado.edu/studentaffairs/judicialaffairs/code.html#student\\_code](http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code)
- All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council ([honor@colorado.edu](mailto:honor@colorado.edu); 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at [www.colorado.edu/policies/honor.html](http://www.colorado.edu/policies/honor.html) and at [www.colorado.edu/academics/honorcode/](http://www.colorado.edu/academics/honorcode/).
- The University of Colorado Policy on Sexual Harassment applies to all students, staff and faculty. Sexual harassment is unwelcome sexual attention. It can involve intimidation, threats, coercion, or promises or create an environment that is hostile or offensive. Harassment may occur between members of the same or opposite gender and between any combinations of members in the campus community: students, faculty, staff, and administrators. Harassment can occur anywhere on campus, including the classroom, the workplace, or a residence hall. Any student, staff or faculty member who believes s/he has been sexually harassed should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals who believe they have been sexually harassed can be obtained at <http://www.colorado.edu/odh/>