Evaluation and Administration

There will be one midterm examination and a take-home final exam, each counting towards 25% of your course grade. There will also be some computer exercises and problem sets counting another 10% of the final grade. The remaining 40% of your grade will be based on your individual project (30%) and a class presentation of an article on econometric methodology (10%), both described below.

Please see the addendum to this syllabus for policies concerning observance of religious holidays, classroom conduct, accommodation of disabilities, honor code, and discrimination and harassment. Please contact me promptly if you have any problems that we need to discuss.

Individual Projects

You will each be responsible for an individual term project on an econometrics topic of interest to you. Your choice of topic should be related to the general areas mentioned above (simultaneous equations problems or time series methods). Ideally your project should have both a theoretical or analytical component and an application, and the project should encompass a topic in econometrics that goes beyond what we cover in class. To make this assignment more concrete, an example of an appropriate project could involve allowing for structural breaks in tests of nonstationarity (unit roots). Although we will cover unit root testing in some depth, we will probably not cover this particular extension. There is a theoretical literature in which these tests are developed, and the analytical component of the project would present the statistical foundations behind these tests. Then the tests could be applied to one or more time series of interest as the applied component. In some cases the applied component could be a Monte Carlo or bootstrap simulation that demonstrates the performance of an econometric test or procedure in a particular context. Ideas for these projects are suggested by the various readings below, and I will mention other possible topics in class.

output and answers to exercises requiring some interpretation of the output. Instructions for the use of Eviews, the exercises, and the data sets will be posted on our CULearn site that you can access at https://culearn.colorado.edu .

I will also design several problem sets that require you to extend the mathematical presentation from class into new areas. Collaboration on the computer exercises and problem sets is encouraged, and I will recommend that you form teams of two for these exercises.

Article Presentation

In keeping with the seminar format, teams of two students will be responsible for presentations to the class on advanced econometric methodology. These presentations will introduce the class to some special topics related to our course. My goal is to acquaint the class with a variety of econometric models and procedures that we will not have time to cover in depth. Hopefully, some of these topics could be incorporated into future research projects.

I list below a number of articles that would be appropriate for student presentations. Each of these is related to the major topics of the course, and presentations will be scheduled to fit with the course sequence. I am open to suggestions for other articles for presentation, as long as these fit within the major themes of the course. During the first two weeks of

Pantula, S.G., G. Gonzalez-Farias, and W.A.

7. **Panel Unit Roots and Cointegration.** Maddala, G. S. and Shaowen Wu, "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test," Oxford Bulletin of Economics and Statistics Special Issue, 61 (1999) 631-652. *One strategy for increasing the power of unit root tests is to combine several related time series into a pooled regression. A number of strategies for testing unit roots in panel data sets have been developed in recent years, and this paper provides a lucid review of the issues involved.*

Baltagi, B.H. *Econometric Analysis of Panel Data.* Chichester, UK Wiley (2008) "Nonstationary Panels" chapter 12. *This chapter gives a good overview of both unit root and cointegration tests with panel data.*

B. Integrated Processes and unit root tests.

Enders, chapter 4.

Distribution theory for integrated processes; Dickey-Fuller tests and their extensions; Monte Carlo studies of size and power of unit root tests; structural change.

Student presentations:

1. Monte Carlo Studies of Unit Root Tests. 9/18
2. Spurious Regressions. 9/23
3. Structural Breaks 9/25

Computer exercise 1. Introduction to Eviews (due 9/11)

Computer exercise 2: unit root testing (due 9/23)

Computer exercise 3: progrC TEMC 008 aize a

E. Additional time series topics; extensions.

Enders, chapter 3; chapter 7

Student presentations

8. Regime Switching Models. (11/13)

II. Simultaneous Equations Models

A. Identification

Greene, Sections 16.1-16.3

B. Estimation and specification tests.

Greene, Sections 16.4-16.7

Term Projects Due December 4.

Computer exercise 6. Simultaneous equations estimation. (due 12/11)

Take-home final: distributed December 4, due December 13 at 10:00 a.m.

Additional References

Our text contains numerous references to additional literature. In addition to these, the following references are included for further reading, with an emphasis on time series econometrics.

Banerjee, Anindya, Juan Dolado, John Galbraith, and David Hendry, Cointegration, Error Correction and the Econometric Analysis of Non-Stationary Data. Oxford: Oxford

Hahn, Jinyong, and Jerry Hausman, "Weak Instruments: Diagnosis and Cures in

Journal of Economic Surveys volume 12, no. 5 (December 1998) *A special issue of surveys on practical issues in unit root testing and cointegration.* The article by Haldrup is a fairly intelligible paper on I(2) modeling.

Journal of Policy Modeling volume 14 (August 1992) is a special issue on Cointegration, Exogeneity, and Policy Analysis.

Juselius, Katarina, *The Cointegrated VAR Model*, Oxford, Oxford University Press (2006). *This is a comprehensive and up-to-date presentation of the Johansen approach to cointegration modeling.*

King, R.G., C.I. Plosser, J.H. Stock, and M.W. Watson, "Stochastic Trends and Economic Fluctuations," American Economic Review 81 (September 1991) 819-840. *Application of cointegration and common trends analysis to real business cycle model.*

Kwiatkowski, Denis, et al. (KPSS) "Testing the Null Hypothesis of Stationarity Against the Alternative of a Unit Root," Journal of Econometrics 54 (1992) 159-178. *Presents a test that reverses the null and alternative hypotheses from those of the Dickey-Fuller approach.*

Maddala, G. S. and In-Moo Kim, Unit Roots, Cointegration, and Structural Change Cambridge: Cambridge University Press (1998). This is an excellent, wide-ranging survey of models and methods for handling nonstationary variables.

Maddala, G. S. and Shaowen Wu, "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test," Oxford Bulletin of Economics and Statistics Special Issue, 61 (1999) 631-652. *One strategy for increasing the power of unit root tests is to combine several related time series into a pooled regression. A number of strategies for testing unit roots in panel data sets have been developed in recent years, and this paper provides a lucid review of the issues involved.*

Nelson, Charles, and Charles Plosser, "Trends and Random Walks in Macroeconomic Time Series: Some Evidence and Implications," J. of Monetary Economics 10 (1982) 130-62. An early application of unit root tests to economic time series. They find most of the series studied to be integrated, a result contested by later researchers using different methods. Their data set is available for further investigations.

Nelson, Charles R., and Heejoon Kang, "Pitfalls in the Use of Time as an Explanatory Variable in Regression," Journal of Business and Economic Statistics 2 (1984) 73-82. *The traditional practice in regression analysis with trended variables is to control for deterministic trends. This article shows what happens under such treatment if the variables actually have stochastic trends.*

Ng, S. and P. Perron, “Lag length selection and the construction of unit root tests with good size and power,” Econometrica 69 (2001) 1519-1554. They have combined insights from several alternative approaches to unit root testing to develop test procedures that are currently recognized as the state of the art in unit root testing. These test procedures are also appropriate, with suitable modifications, as residual based tests for cointegration. Their procedures are programmed into recent versions of EViews.

Oxford Bulletin of Economics and Statistics volume 48 no. 3 (1986) is a special issue containing early papers on cointegration and error correction models.

Oxford Bulletin of Economics and Statistics Volume 54, No. 3 (August 1992) is another special issue on Testing Integration and Cointegration.

Oxford Bulletin of Economics and Statistics

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; 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 http://www.colorado.edu/policies/honor.html and at http://www.colorado.edu/academics/honorcode/