Economics 397 Spring 1998
Macro-Econometrics Professor Miller
Ms. Pattanapanchai

This course builds on the econometrics courses (either Economics 212 and 213, or 310, or 411 and 412) and supplement work in macroeconomic theory courses (Economics 309, 419, and 429) and courses in monetary theory and policy (Economics 346 and 347). Nevertheless, some students may not have taken Economics 309, 346, 347, 419 and 429. Thus, these course are not prerequisites for this course. Either Economics 212 and 213, or 310, or 411 and 412 is highly recommended. In fact, if you do not have one of the econometrics sequences, you are well-advised to **not** to register for this course. The graduate assistant for this course is Maneechit Pattanapanchai. She will assist you in learning the necessary software to perform the homework assignments. The book in the Coop uses RATS, but you can also use SHAZAM and E-VIEWS to complete the homework assignments.

Course Grading Procedure:

Your grade will be based on homework assignments (20 percent), a mid-term exam (40 percent), and a final exam (40 percent). I encourage you to form study groups. The study groups can consult on the homework assignments. In fact, I do encourage you to work on your homework in your study groups. When you prepare your homework assignments, however, it should be in your own words. Also, please list the names of the other members of your study group on the front page of your homework assignment.

Textbooks: (All textbooks are available in the UConn Coop)

1. ***Applied Econometric Time Series (AETS)***, Walter Enders, Wiley, 1995.

2. ***RATS Handbook for Econometric Time Series (RHETS)***, by Walter Enders, Wiley, 1996.

Homework Assignments:

I expect you to work through RHETS on your own (in study groups). You may hand in your homework assignments as you complete them. The due dates for homework assignments are listed in the course outline.

Course Outline and Bibliography:

I. Introduction and Background

A. Time Series Models

B. Difference Equations

1. Solution Techniques

Readings:

1. AETS, Chapter 1.
2. Zellner and Palm, *Journal of Econometrics*, May 1974, 17-54.

Homework (Due Wednesday, February 4):

1. RHETS, Chapter 1, Additional Exercises 1, 2, and 3.

II. Univariate Time Series Models: Box-Jenkins Analysis

A. Stochastic Difference Equations

B. ARIMA Models

1. **Autocorrelation Function**

2. **Partial Autocorrelation Function**

C. **Box-Jenkins Model Selection**

Readings:

1. AETS, Chapter 2.
2. Nelson, ***Applied Time Series Analysis for Managerial Forecasting***.
3. Miller and Russek, ***Contemporary Policy Issues***, October 1989, 91-115.

Homework (Due Wednesday, February 25):

1. RHETS, Chapter 2, Additional Exercises 1, 2, 3, 4, and 5.

III. Volatility and Trends in Time Series

A. **Stylized Facts**

B. **Modeling Volatility in Time Series**

1. **ARCH**

2. **GARCH**

3. **ARCH-M**

C. **Decomposing Time Series into Trends and Cycles**

1. **Deterministic Trend Decomposition**

2. **Stochastic Trend Decomposition**

D. **Detrending Time Series**

Readings:

1. AETS, Chapter 3.
2. Engle, ***Econometrica***, July 1982, 987-1007.
3. Bollerslev, ***Journal of Econometrics***, (31), 1986, 301-27.
4. Engle, Lillien, and Robins, ***Econometrica***, March 1987, 391-407.
5. Nelson and Plosser, ***Journal of Monetary Economics***, September 1982, 130-62.
6. Beveridge and Nelson, ***Journal of Monetary Economics***, March 1981, 151-74.
7. Miller and Russek, ***Contemporary Policy Issues***, October 1989, 91-115.
8. Miller, ***Journal of Monetary Economics***, January 1988, 141-42.
9. Newbold, ***Journal of Monetary Economics***, December 1990, 453-57.

Homework (Due Wednesday, March 25):

1. RHETS, Chapter 3, Additional Exercises 1 and 2.

IV. Testing for Trends and Unit Roots

A. What is a Unit Root?

1. Spurious Regression Problem

B. Tests for a Unit Root

1. Dickey-Fuller Test

2. Augmented Dickey-Fuller Test

3. Philips-Perron Tests

4. Structural Change and Unit Root Tests

C. Problems with Unit Root Tests

1. Power of Tests

2. Choice of Deterministic Regressors

D. Unit Roots in Panel Data

<u>Readings:</u>

1. AETS, Chapter 4.
2. Granger and Newbold, ***Journal of Econometrics***, (2) 1974, 111-20.
3. Dickey and Fuller, ***Journal of the American Statistical Association***, June 1979, 427-31.
4. Dickey and Fuller, ***Econometrica***, July 1981, 1057-72.
5. Dickey and Pantula, ***Journal of Business and Economic Statistics***, (5) 1987, 455-61.
6. Dickey, Bell, and Miller, ***American Statistician***, (40) 1986, 12-26.
7. Said and Dickey, ***Biometrica***, (71) 1984, 599-607.
8. Perron, ***Econometrica*** (57) 1989, 1361-1401.
9. Phillips, ***Journal of Econometrics***, (33) 1986, 311-40.
10. Sims, ***Journal of Economic Dynamics and Control***, (12) 1988, 463-74.
11. Quah, ***Economics Letters***, (44) 1994, 9-19.

<u>Homework (Due Wednesday, April 8):</u>

1. RHETS, Chapter 4, Additional Exercises 1, 2, and 3.

V. Multivariate Time-Series Models

A. Intervention Analysis

B. Transfer Function Models

C. Vector Autoregression (VAR) Analysis

1. Estimation

2. **Impulse Response Function**

3. **Variance Decomposition**

4. **Granger Causality**

D. **Structural VARs**

1. **Structural Decomposition**

E. **Bayesian Vector Autoregression (BVAR) Models**

Readings:

1. AETS, Chapter 5.
2. Miller and Russek, ***Journal of Macroeconomics***, Summer 1996.
3. Sims, ***Econometrica***, January 1980, 1-49.
4. Blanchard and Quah, ***American Economic Review***, September 1989, 655-73.
5. Cooley and LeRoy, ***Journal of Monetary Economics***, November 1985, 283-308.
6. Doan, Litterman, and Sims, ***Econometric Reviews***, (3) 1984, 1-100.
7. Dua and Miller, ***Journal of Real Estate Finance and Economics***, November 1996.

Homework (Due Wednesday, April 22):

1. RHETS, Chapter 5, Additional Exercises 1.

VI. **Cointegration and Error-Correction Models**

A. **Cointegration**

1. **Solution to Spurious Regression Problem**

2. **Common Trends**

B. **Cointegration and Error-Correction**

1. **Granger Representation Theorem**

C. **Testing for Cointegration**

1. **Engle-Granger Method**

2. **Johansen Method**

Readings:

1. AETS, Chapter 6.
2. Miller and Russek, ***Southern Economic Journal***, July 1990, 221-29.
3. Miller, ***Journal of Money, Credit and Banking***, May 1991, 139-54.
4. Dickey, Jansen, and Thornton, Federal Reserve Bank of St. Louis ***Review***, March/April 1991, 58-78.
5. Engle and Granger, ***Econometrica***, March 1987, 251-76.
6. Engle and Yoo, ***Journal of Econometrics***, (35) 1987, 143-59.
7. Johansen, ***Journal of Economic Dynamics and Control***, June-September 1988, 231-54.
8. Johansen and Juselius, ***Oxford Bulletin of Economics and Statistics***, (52) 1990, 169-209.

Homework (Due Wednesday, May 6):

1. RHETS, Chapter 6, Additional Exercises 1 and 2.