This course will cover statistical models for the analysis of economic time series data, with applications in macroeconomics and finance. It is intended both for students specializing in econometric theory and for students interested in applying time series methods to economic data. Economics 240A-B (or equivalent) is prerequisite. Economics 241A is not required for Economics 241B this semester, though, of course, it wouldn’t hurt.

The class will meet Monday and Wednesday 4-5:30. Grading will be based on performance on the (approximately biweekly) problem sets and midterm and final exams. The first half of the semester will primarily be devoted to analysis of stationary time series data, while the second half will address nonstationarity and nonlinearity/nonnormality in time series.

The principal texts for the class are:


Other useful references are:


More advanced treatments of some of the topics covered can be found in:


**REFERENCE LIST FOR 241B**

1. **Discrete Time Stochastic Processes**: stationarity and ergodicity; limit theorems; ARMA and ARIMA models; linear projections and forecasting; Wold decomposition theorem.


   Harvey, chapters 1 and 2.

   Hamilton, chapters 1 through 3.


   Granger and Newbold, chapter 1.

   Gourieroux and Monfort, chapters 5, 8, 9.


   Harvey, chapters 3 and 5.

   Hamilton, chapters 4 and 5, 7.


   Granger and Newbold, chapters 3-5, sections 6.3-7.3.

3. **Vector Processes**: vector AR and ARMA processes; Granger-Sims causality.

   Harvey, chapter 7.

   Hamilton, chapters 10 and 11.


   Gourieroux and Monfort, chapter 10.
4. **Frequency Domain Analysis**: spectra, filters, transforms, nonparametric estimation.

Harvey, chapter 6.

Hamilton, chapter 6.

Sargent, sections 11.4-11.12.

Granger and Newbold, chapter 2.


5. **State-space Models and the Kalman Filter**

Harvey, Chapter 4

Hamilton, Chapter 13

Gourieroux and Monfort, Chapters 15-16


6. **Nonstationary Time Series: Introduction**

Hamilton, Chapter 15-16

Banerjee, Chapters 1-2

Gourieroux and Monfort, Chapter 11 and Sections 14.1 and 14.2

7. **Univariate Integrated Processes: Testing for Unit Roots**

Hamilton, Chapter 17

Banerjee, Chapter 3-4

Gourieroux and Monfort, Section 14.3
8. **Cointegrated Time Series and Common Trends**

Harvey, Chapter 7, Sections 7.6-7.7

Hamilton, Chapter 18-20

Banerjee, Chapters 5-8

Gourieroux and Monfort, Section 14.5

9. **Nonlinear Models, Conditional Heteroscedasticity and Structural Breaks**

Harvey, Chapter 8

Hamilton, Chapter 21-22

