MIT, Department of Economics
Tu, Th 2:30-4:00, E51-057

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# 14.384 Time Series Analysis

This course provides an introduction to univariate and multivariate time series analysis. It starts by introducing basic concepts and models and progresses to more complicated models. The course intends to provide tools for empirical work with time series data and to give an introduction to the theoretical foundations of time series analysis.

The class will meet Tuesday & Thursday, 2:30-4:00, in E51-057. In addition, weekly sections will be conducted Wednesday, 4:00-5:30, in E51-390. My office hours are Tuesday, 10:30-12:00, in E52-262F.

Grading will be based on performance on the problem sets (30%) and the final exam (70%). The final exam will be held in the final exam week. Any time conflicts should be discussed with the instructor well before the exam date.

The required text for the class is:

- Hamilton, J., *Time Series Analysis.* Princeton University Press, 1994 (cited as "Hamilton").

Other useful references are:

- Brockwell, P. and R. Davis. *Time Series: Theory and Methods, Second Edition.* Springer-Verlag, 1991.
- Enders, W. *Applied Economic Time Series, Second Edition.* Wiley, 2004.
- Hayashi, F. *Econometrics.* Princeton University Press, 2000.

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

- Billingsley, P., *Convergence of Probability Measures, Second Edition.* New York: Wiley, 1999.
- Davidson, J., *Stochastic Limit Theory.* Oxford: Oxford University Press, 1994.
- Fuller, W.A., *Introduction to Statistical Time Series, Second Edition.* New York: Wiley, 1996.
- Tanaka, K., *Time Series Analysis: Nonstationary and Noninvertible Distribution Theory.* New York: Wiley, 1996.
- White, H., *Asymptotic Theory for Econometricians, Second Edition.* New York: Academic Press, 2000.

## TENTATIVE COURSE OUTLINE:

1. **Univariate stationary time series: Concepts, models and representations**
   Hamilton, Chapters 1-4 & 6.

2. **Univariate stationary time series: Estimation and inference**
   Hamilton, Chapters 5 & 7.

3. **Multivariate stationary time series: Concepts, VARs and GMM**
   Hamilton, Chapters 10, 11 & 14.

4. **Univariate nonstationary time series: Testing for unit roots**
   Hamilton, Chapter 17.

5. **Multivariate nonstationary time series: Spurious regressions and cointegration**
   Hamilton, Chapters 18-20.