The course: This course in an introduction to the economic and statistical analysis of time series data, focusing on time-series models that characterize these data and shed light on economic behavior. The importance of these methods should not be underestimated: most of what we know about the overall economy and finance is based on our observations of how prices and quantities vary over time.

The level of the course presumes that you have a solid foundation in probability theory, statistics, and econometrics at the introductory level, with at least some experience with the standard tools of dynamic analysis such as difference and differential equations. We will mostly apply the tools of time series analysis to economic problems, rather than on formally proving theoretical propositions. However, the ability to apply these techniques often requires knowledge of the underlying theory, so expect some rigor.

Course pre-requisites or co-requisites: ECON 8070 and ECON 8080.

Required texts:


Grading: Your final course grade will be a weighted average of your performance on problem sets (30%), a final exam (45%), and a short paper (25%). The short paper is described in detail under the “Assignments” course tool to the left. I will not accept homework if it is turned in late.

Problems sets will be a mixture of analytical problems and empirical projects for which you will be asked to apply the techniques discussed in course to actual data. Therefore, you should have access to a statistical software program. I am going to require that you use RATS for your statistical work. Through the Estima web site, you can order a student version at reduced cost. Alternatively, I have asked the university bookstore to stock a very inexpensive ($25) classroom version of the program that has a one-year expiration. The classroom version can be upgraded to a full student version later, if you choose.

Course web site: I will use the eLC course web page, accessible from the link above, to provide information and to facilitate out-of-class communication. Please check the course
page daily. The “course content” page includes links to the syllabus and the overheads to be used in class (the overheads are subject to change during the semester). I will post announcements and homework assignments there. I encourage the class to use the discussion facility to post questions, answers, and comments about the material we discuss in class, or other items relevant to that material. Feel free to use the site’s mail tool; however, if you have a very important message for me, use my regular e-mail address since I check it continuously.

**Attendance:** I expect full attendance throughout the semester. If you must miss a class, let me know in advance.

**Academic honesty:** I expect all students in this course to fully understand and comply with UGA’s culture of academic honesty: *As a University of Georgia student, you have agreed to abide by the University’s academic honesty policy, “A Culture of Honesty,” and the Student Honor Code. All academic work must meet the standards described in “A Culture of Honesty” found at: www.uga.edu/honesty. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.*

This syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

**Course outline with relevant chapters from the texts:**

1. Introduction: Stochastic processes

2. Linear regression with time series data
   (a) The classical linear regression model
       
       Hamilton: 8.1; Hayashi: 1.1, 1.3, 1.5
   (b) Generalized linear regression
       
       Hamilton: 8.3; Hayashi: 1.6
   (c) Regression models with lagged dependent variables
       
       Hamilton: 8.2; Hayashi: 2.1 2.3
   (d) Inference
       
       Hamilton: 5.8; Hayashi: 2.10
   (e) Endogenous regressors: IV and GMM
       
       Hamilton: 9; Hayashi: 3.1 3.4

3. Time series models
   (a) Basic concepts
       
       Hamilton: 1, 2, 3.1 3.3
   (b) Linear univariate models
       
       Hamilton: 3.4, 3.7, 4, 5.15.6; Hayashi: 6.1-6.2, 6.4
   (c) Vector autoregression
       
(d) Identifying VARs
  Hamilton: 11.4-11.6

(e) ARCH models
  Hamilton: 21

4. Non-stationarity

(a) Univariate process: unit roots
  Hamilton: 15, 16, 17; Hayashi: 2.12, 9

(b) Multivariate processes: cointegration
  Hamilton: 19, 20; Hayashi: 10