I. Instructor Info

Name: Peter Bearse
Office: 447 Bryan Building
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Office Hours:
- Mondays, 11am – 12:30pm,
- Tuesdays, 2 – 4pm,
- Wednesdays, Noon – 1:30pm, or
- By appointment

II. Course Info

Time and Place:
- 2 – 3:50 pm, Mondays, Bryan 117
- 2 – 3:50 pm, Wednesdays, Bryan 211

Course Description: Linear time series modeling and forecasting. Covers linear difference equations, Univariate techniques addressed include autoregressive moving average (ARMA) models, generalized autoregressive conditional heteroskedasticity (GARCH) models, statistical tests for unit roots, and autoregressive integrated moving average (ARIMA) forecasts. Multivariate techniques addressed include vector autoregressive (VAR) models.
Learning Objectives: Students are expected to develop an applied foundation for the analysis and forecasting of stationary and nonstationary macroeconomic time series data. Specific skills to be developed include the following:
1) Solution methods for stochastic linear difference equations.
2) Statistical approaches to analyzing stationary univariate time series (ARMA and GARCH).
3) Statistical tests for trending behavior in macroeconomic time series (Unit Root tests and ARIMA forecasting).
4) Statistical analysis of multivariate time series using vector autoregressions (VARs).
5) Proficiency at building linear time series models for the forecasting of macroeconomic time series in the programming language MATLAB.

Required Course Texts:

Other Useful References
- Pindyck, Robert S. and Daniel L.

Software (Licensed by UNCG): MATLAB

We will use MATLAB on the PC platform. It is also available through UNIX (which can be useful for working from home).

Grading: Your grade will be based on one in-class midterm exam (30%), one Matlab project (35%), and a final exam (35%). You are expected to abide by the UNCG Academic Honor Code.

I will also periodically post problem sets. These will not be graded and you are free to work together on them.
III. Tentative Course Outline

**Monday, January 10 – Monday, February 27:** Difference Equations and AutoRegressive Moving Average (ARMA) models

**Monday, March 6 – Monday, May 1:** Conditional Heteroskedasticity, Nonstationarity, and Multivariate Time Series

**Midterm Exam:** Wednesday, March 1  
**Matlab Project Due:** Monday, May 1, 11:59pm (by email)  
**Final Exam:** Monday, May 8, Noon – 3pm