ADVANCED APPLIED TIME SERIES

Goal:

The purpose of the course is to introduce economic time series modeling techniques to the students preparing or writing their dissertations in the fields such as macroeconomics, macro-finance, international finance, economic development and others. In particular, the course focuses on the State Space models and Dynamic Factor models highly successful in analyzing many economic time series data. Understanding of the basic modeling techniques as well as development of computational skills is emphasized.

Prerequisites: Econ 817 or the instructor's consent.

Texts: The main textbooks are:


Grading:

There are no exams but two papers are required to finish this course. First one is a computational exercise to replicate the results of a recent empirical paper using new time-series techniques in the field of your interest. Second paper is your hypothetical dissertation proposal based on the first exercise. Also 6 Problem sets.
Course Outline:

1. Stationary Time Series
   a. ARMA Process: Ham 3
   b. Forecasting: Ham 4
   c. Estimation: Ham 5
   d. Spectral Analysis: Ham 6

2. Unit Roots
   a. Trend Stationary vs. Difference Stationary: Ham 15-16
   b. Tests for a Unit Root: Ham 17
   c. Trend Breaks and Fractional Unit Root: Ham 15.5

3. Vector Processes
   a. Stationary Process: Ham 10
   b. Vector Auto Regression (VAR): Ham 11
   c. Structural VAR: Ham 18

4. Cointegration
   a. Long Run Equilibrium
   b. Cointegrating Regression: Ham 19
   c. Error Correction Model and ML Inference: Ham 20

5. State Space models        A&M (K&N)
   a. Kalman Filter
   b. Dynamic Factor models

6. Bayesian Approach       Koop

7. Nonlinear Time Series Models
   a. Markov Switching Model: Ham 22
   b. Threshold Autoregressive Model