Course Description: (A brief description of the course content to be covered.)
This course will teach you a practical approach to modeling and forecasting time series data. The goal of modeling is to explain and to predict: to account for why a phenomenon varies over time and to predict its future. The course focus is on empirical modeling, rather than theoretical properties. You will learn how to propose models, estimate them with data, diagnose whether they fit, and interpret their meanings. Models covered include random samples, random walks, regression, autoregression, moving averages, and related structures. Computer demonstrations with both real and simulated data will be used extensively.

Day 1:
(Brief daily outline or expectations.)
Introduction to time series modeling
Examples of time series data
Objectives:
   Explanation
   Forecasting
The random sample as the basic time series model
Estimating and forecasting a random sample
Finding random samples in real data
A general approach to modeling
   Actual = Fit + Residual
   Propose model
   Estimate model
   Verify model
   Use model
Why it matters to have a correct model
   Bias
   Margin of error

Day 2:
(Brief daily outline or expectations.)
Computer software
   SAS and Excel
The random walk
   Definition
   Verification
   Forecasting
   Implications
Finding random walks in real data

Autoregression
  Definition
  Verification
  Forecasting

Durbin-Watson statistic

Autocorrelation function

Partial autocorrelation function

Finding autoregressions in real data

Day 3:
(Brief daily outline or expectations.)
Experiences with modeling real univariate time series
A layered approach to time series features:
  Trends
  Seasons and cycles
  Autocorrelation
  Heteroscedasticity

Day 4:
(Brief daily outline or expectations.)
Multivariate time series modeling
Other topics (as time permits)
  Moving averages
  ARIMA
  Panel data