Stats 531 (Winter 2016)

Analysis of Time Series
Tu/Th 2:30-4:00;

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Pre-requisites: Stats 426 (Introduction to Theoretical Statistics) or equivalent.

Course description:

This course gives an introduction to time series analysis using time domain methods and frequency domain methods. The goal is to acquire the theoretical and computational skills required to investigate data collected as a time series. The first half of the course will develop classical time series methods, including auto-regressive moving average (ARMA) models, regression with ARMA errors, and estimation of the spectral density. The second half of the course will focus on state space model techniques for fitting structured dynamic models to time series data. We will progress from fitting linear, Gaussian dynamic models to fitting nonlinear models for which Monte Carlo methods are required. Examples will be drawn from ecology, economics, epidemiology, finance and elsewhere.

There will be weekly homeworks, a midterm project analyzing a time series of your choice, a midterm exam and a final project. The final project may be (but does not have to be) a continuation of the midterm project.