Midterm Exam for STAT520

Thursday, April 9, 6:00-7:30pm
BRNG 1232

Note: It will be an open-book exam. You can bring in any books and notes. You will need a calculator for basic calculations but are not allowed to use computer during the exam. There will be no class on Tuesday, April 7.

Review of Topics

1. Chapters 1-3 Basic Concepts
   a. Stationarity
   b. Means; AFC; Sample AFC
   c. Basic properties of covariance function
   d. Trend
2. Chapter 4 Stationary Models
   a. AR model and characteristics
   b. MA model and characteristics
   c. ARMA model and characteristics
   d. Yule-Walker equation for AR and ARMA models
   e. Calculation of auto-covariance function for AR, MA and ARMA models
3. Chapter 5 Non-Stationary Models
   a. ARIMA models
   b. Identification of ARIMA modes
   c. Box-Cox transformation
4. Chapter 6 Model identification
   a. Identification of AR, MA and general ARMA models from the sample means and the sample ACF or PACF
   b. PACF (definition and calculation)
   c. Information criteria
5. Chapter 7 Parameter Estimation
   a. Sample ACF
   b. Yule-Walker equations
   c. Least squares methods
   d. MLE
6. Chapter 9 Forecasting
   a. Hand calculation for ARI model such as ARI(2, 1).
7. Chapter 10 Season Models
   a. Understand and Identify seasonal models including multiplicative seasonal ARIMA.
   b. Basic properties of ACF of seasonal ARMA models