Math 5075: Time Series Analysis
University of Utah – Spring 2019

Course Section: Math 5075-001
Meetings: Tuesday, Thursday, 6:00 PM - 7:30 PM, LCB 215

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Office Hours: 5:00 - 6:00 PM Thursday, or by appointment
Homepage: Online via Canvas. Official announcements and homework assignments will be posted there.

Textbooks


Purpose of Course

From: http://www.statsoft.com/Textbook/Time-Series-Analysis#1general

Time series data is a sequence of measurements that follow non-random orders. Unlike the analyses of random samples of observations that are discussed in the context of most other statistics, the analysis of time series is based on the assumption that successive values in the data file represent consecutive measurements taken at equally spaced time intervals.

There are two main goals of time series analysis: (a) identifying the nature of the phenomenon represented by the sequence of observations, and (b) forecasting (predicting future values of the time series variable). Both of these goals require that the pattern of observed time series data is identified and more or less formally described. Once the pattern is established, we can interpret and integrate it with other data (i.e., use it in our theory of the investigated phenomenon, e.g., seasonal commodity prices). Regardless of the depth of our understanding and the validity of our theory behind the phenomenon, we can extrapolate the identified pattern to predict future events.

Prerequisites

This course assumes a solid knowledge of Calculus (at least Calc I, II, and III), linear algebra (Math 2270), probability theory (Math 5010), and mathematical statistics (Math 5080-5090). If you’re not comfortable with all of those you will probably struggle in this course. It is also helpful to have a background in differential equations (Math 2250 or
2280), Markov Chains (Math 5040), and basic complex variables (Math 4200). The latter three are not required but are helpful.

**Homework**

There will be regular assignments that mix both theory and analysis of time series data using R. You will need to download R and the interface program RStudio to do the assignments. You need to constantly keep the versions up to date on your computer, else some of the software packages we use may stop working.

The grade is based on the result of these assigned works, plus exams.

**Exams**

Midterm: Thursday, February 28th (tentative)
Final Exam: Thursday, April 25th (tentative)

**Grading**

Homework: 70%
Exams: 30%

**Important Dates**

First class: Tuesday, January 8th
Spring Break: March 10th-17th
Last class: Tuesday, April 23rd

**ADA Statement**

The University of Utah is fully committed to policies of nondiscrimination and equal opportunity. The Americans with Disabilities Act requires that reasonable accommodations be provided for students with physical, cognitive, systemic learning, and psychiatric disabilities, and the University seeks to provide equal access to its programs, services, and activities for people with disabilities. Reasonable prior notice is necessary to arrange such accommodations, and students are responsible for obtaining the accommodations and notifying the instructor through official channels early in the semester.