Statistics 5550
Introductory Time Series Analysis

Spring 2013 Syllabus

Instructor: Dr. Christopher Hans
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Office: 327 Cockins Hall
Website: Carmen
When: MWF 1:50-2:45
Where: SB 315
Office Hours: Wednesday 3:00–4:00

Course Description
Stat 5550 introduces the statistical methodology and models required to analyze time series data in practice. The course emphasizes both modeling methodology (model identification, estimation and diagnostics) and the practical implementation of time series modeling using the statistical software R. Familiarity with introductory mathematical statistics and probability (random variables and their distributions, covariance and correlation, maximum likelihood estimation, confidence intervals, hypothesis tests, regression modeling) at the level of the prerequisites listed below is assumed. Topics covered include:

1. Introduction to time series data
2. Time series models and stationary processes
3. Exploratory data analysis
4. Methods for estimating and eliminating trend and seasonality
5. Estimating mean, autocovariance, and autocorrelation functions
6. ARIMA models
7. Forecasting and estimation
8. Modeling nonstationary processes
9. Advanced models as time allows (e.g., nonlinear processes, models for volatility, state-space models, regression with time-series errors)

Prerequisites
Stat 4202 (421) and Stat 5302 (530).

Text

Computing
The class requires you to use the statistical software package R. Instructions on how to use this package will be provided in class.

Assignments
Graded homework assignments will be assigned regularly during the semester. The assignments are to be turned in during class on the dates they are due. Students are allowed to consult with each other on the homework, but each student must hand in his or her own work. DO NOT copy any part of another student’s homework and DO NOT turn in solutions that you have taken from other sources.
Exams
There will be two in-class midterm exams (tentatively February 15th and March 27th) and a final exam (Friday, April 26th).

Project
There will be an end-of-semester, individual project involving the analysis of time series data. Details will be provided during the semester.

Evaluation
The final course grade will be based on:
- Assignments ................................................................. 25%
- Midterm Exams ............................................................. 30%
- Project ................................................................. 15%
- Final Exam (April 26th) .............................................. 30%

Academic Misconduct
Please help maintain an academic environment of mutual respect and fair treatment. You are expected to produce original and independent work on the homework and exams. Although students may consult with each other on homework assignments, all students must submit their own work in their own words. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with university policy, which can be found at [http://oaa.osu.edu/coam.html](http://oaa.osu.edu/coam.html). The Code of Student Conduct is available at [http://studentaffairs.osu.edu/csc/](http://studentaffairs.osu.edu/csc/).

Addressing Issues of Differing Abilities
All students who feel they may need accommodations based on the impact of a disability should contact the instructor privately to discuss their specific needs. Students with documented disabilities must also contact the Office of Disability Services (ODS) in 150 Pomerene Hall (phone: 292-3307) to coordinate reasonable accommodations for the course. ODS forms must be given to the instructor as early in the quarter as possible.

Syllabus Version
1/10/13: Updated office hours
1/7/13: Updated classroom
1/6/13: Original