Statistics 6550
The Statistical Analysis of Time Series

Autumn 2012 Syllabus

Instructor: Dr. Christopher Hans
Email: hans@stat.osu.edu
Office: 327 Cockins Hall
Website: Carmen

When: TR 10:20-11:15
Where: 395 Watts Hall
Office Hours: Wednesdays 11:00-12:00
Website: Fridays 8:30-9:30

Course Description
Stat 6550 aims to develop a working knowledge of time series analysis and forecasting methods. Emphasis is placed on modeling methodology (identification, estimation, diagnostics, and updating) and forecasting. Statistical theory is introduced to facilitate the analysis of time series data in practice. Topics covered include:

1. Time series models and stationary processes
2. Estimating mean, autocovariance, and autocorrelation functions
3. Methods for estimating and eliminating trend and seasonality
4. Statistical properties of stationary processes and linear processes
5. Autoregressive and moving average processes
6. Forecasting stationary time series
7. Defining and modeling autoregressive moving average processes
8. Nonstationary and seasonal processes
9. Regression with time series errors
10. Nonlinear processes

Prerequisites
Graduate-level preparation in mathematical statistics and regression modeling at the level of:

{Stat 623 or Stat 622 or Stat 6201 or Stat 6302 or Stat 6802} AND {Stat 645 or Stat 6450 or Stat 6950}

is necessary to take Stat 6550. Graduate students in disciplines other than Statistics and undergraduates minoring in Statistics who do not have this preparation should consider taking Stat 5550 (Introductory Time Series Analysis).

Text
The course text is Introduction to Time Series and Forecasting (Second Edition) by Brockwell and Davis, New York: Springer, 2002.

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.

All homework must be submitted on 8.5x11 paper. Staple the pages together—we are not responsible for lost pages. Put your name and the homework assignment number on the top right-hand corner of every page. Submit the problems in order, making sure that the computer output and discussion is placed together (do not put the computer output at the end of homework). **Raw computer output is not acceptable.** Make it clear what parts of the output are relevant and show how they answer the questions posed in the homework.

Evaluation  
The final course grade will be based on:

- Assignments ................................................................. 25%
- Midterm Exam .............................................................. 35%
- Final Exam (December 10th) .............................................. 40%

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 exams. Cheating, plagiarism and other forms of 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).

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  
8/22/12: Updated office hours
8/15/12: Original