STAT565: APPLIED TIME SERIES ANALYSIS 16:960:565

SPRING 2014, MONDAY 6:40-9:30 PM, ARC 107 BUS

1. Course Information

- Instructor: Han Xiao
- Office: Hill Center 451
- Office Hours: Thursday 4:30-6:00 pm or by appointment
- Email: hxiao@stat.rutgers.edu
- Prerequisite. First graduate level courses in mathematical statistics and applied regression. This course will cover a great deal of materials at a rapid pace and will require some programming kills (R, or other software of your choice, such as SAS). Students who have had difficulty in previous mathematical statistics courses or programming may find that this course requires a considerable amount of time and effort, and should plan accordingly.
- Text: *Analysis of Financial Time Series*, by Ruey S. Tsay. Wiley, 2010, 3rd. Full text available from MyiLibrary http://lib.myilibrary.com/Open.aspx?id=270783. Access from campus or login via Rutgers account. The book website is:
  http://faculty.chicagobooth.edu/ruey.tsay/teaching/fts3/.
- Software: R. Free software available at http://www.r-project.org/. If you go to Manuals on the left panel of the website, you will find a good introduction *An Introduction to R*. A more advanced reference is *Modern Applied Statistics with S*, by Venables and Ripley. Springer, 2002, 4ed.
- Course website: http://stat.rutgers.edu/home/hxiao/
- Course work: eleven homework assignments, midterm and final exams.
- Grades: homework (30%), midterm (30%), final (40%).

2. Syllabus (tentative)

Week #	Date	Topic	Due
1	Jan 27	Introduction	
2	Feb 03	Exploratory data analysis	HW1
3	Feb 10	Linear time series: AR models	HW2
4	Feb 17	Linear time series: MA and ARMA models	HW3
5	Feb 24	Linear time series: ARMA models	HW4
6	Mar 03	Linear time series: unit-root, ARIMA models	HW5
7	Mar 10	Midterm	
8	Mar 24	Conditional heteroscedastic models	HW6
9	Mar 31	Nonlinear models	HW7
10	Apr 07	Intervention analysis	HW8
11	Apr 14	State space models	HW9
12	Apr 21	Spectral analysis	HW10
13	Apr 28	Spectral analysis	HW11
14	May 05	Spectral analysis / Multivariate time series	HW12
15	TBA	Final	

3. Homework

- Homework will be assigned and collected weekly. The lowest grade will be dropped. **So late homework will NOT be accepted. DO NOT COPY from other sources.**
- All homework assignment must be written on standard 8.5 by 11 paper and stapled together. Computer generated output without detailed explanations and remarks will not receive any credit. You may type out your answers, but make sure to use different fonts to distinguish your own words with computer output. Only hard copies are accepted, except under special circumstances. You should also submit the R source code with computing assignments.
- Data analysis is an integral part of the course. The main software package is R. Instructions for using the package will be given and briefly discussed, assuming you have taken the *Regression Analysis* course with R. If you do not have previous exposure to R (or S+), please be aware that you may need to devote considerable time and effort to get started. R is a free software. You may use any other software package of your choice, but no instructions or help will be given from TA or me.