SYLLABUS

FSRM 565
Financial Time Series Analysis

Spring, 2012

Instructor:	Professor Rong Chen Office: Hill Center 475 Tel: (732) 445-2690 ext 1123 email address: rongchen@stat.rutgers.edu Office Hours: M 3:30-5:00 or by appointment
Grader:	to be determined
Course Web Site:	*http://stat.rutgers.edu/~rongchen/TS_Course11.html*
Prerequisite:	First graduate level mathematical statistics course and graduate level applied regression course It should be emphasized that this course will cover a great deal of material 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 have difficulty with computers 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. 2nd Edition, Wiley [Supplemental Text] *Time Series Analysis and Its Applications, With R Examples*, by Robert Shumway and David Stoffer, 2nd Edition, Springer Note: Not all topics and chapters in the books will be covered. There will be supplemental materials outside the books. Lecture notes will be posted on the course web site.
Lectures:	M 6:40-9:30, SEC 210 BUS
Grading:	Homework & Computing 30% Midterm Exam 35% Final Exam 35%
Schedule:	Midterm: TBA Final: TBA

Homework: 1. Homework will be assigned and collected regularly. **Late homework will not be accepted. DO NOT COPY from other sources**.
2. 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.
3. Homework solutions will be available on our course web site.

Computing: 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 *applied regression* 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. Instructions for installing **R** on PC are available on the course web page. You may use any other software package of your choice, but no instructions or help will be given from TA or me.

Course outline (tentative):

1. **Introduction**
2. **Review: Basic Probability and Statistics, Linear Regression Analysis**
3. **Correlation and Serial correlation**
4. **Trend and Seasonal Components. Transformations**
5. **Univariate ARIMA Models: Model building, Estimation and Prediction**
6. **Conditional Heteroscedastic Models, Stochastic Volatility Models and VaR**
6. **Extreme Value Theory and VaR**
7. **Regime Switching models, Hidden Markov Models and State Space Models**
8. **High-frequency Data**
9. **Nonparametric time series model**
10. (if time permits) **Other Advanced Topics**