

Math 25 Time Series Analysis and Applications (Spring 2011)

Meetings: M&W 9-9:50AM, Seeley Mudd 207; T&F 9-9:50AM, Seeley Mudd 014

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Office Hours: Mon 1-2 PM; Tues 10-11 AM; Fri 1-2 PM; or by appointment

The best way to reach me outside of class is via email. I will always be available right after class and during my office hours should you wish to speak with me in person.

TEXTBOOK

Cryer, J. and Chan, K.-S. *Time Series Analysis with Applications in R*, 2nd edition. 2010 Springer.

OBJECTIVES

The goal of this course is to introduce you to the analysis of time series data, a series of observations collected over time. We will cover Chapters 1-10 in Cryer and Chan. More specifically, we will discuss models for stationary and non-stationary time series, analysis of trends, model specification, parameter estimation, model diagnostics, forecasting future observations, and seasonal time series models. After this course, you should feel comfortable and confident with modeling and forecasting time series data in many research fields.

WEBSITE

We will use **CMS** in this course. Important course materials and announcements will be posted, so you should plan to access the website regularly.

COMPUTING

We will be using the free, yet very powerful and popular, statistics software **R** in this course. The R package is available from www.r-project.org and we will learn how to use it in our labs. You should read carefully the “Introduction to R” Appendix in our text (which starts on page 423).

SUMMARY OF COURSE REQUIREMENTS

Regular homework (include lab assignments), one midterm exam, several quizzes, one project and one final exam are required. Textbook readings will be assigned in class on a regular basis and you are expected to complete readings *before* next class so that the lecture material should make more sense. A rough breakdown of how grades may be determined (subject to change) is:

Item	Percentage	
Homework/Labs	30%	
Midterm Exam & Quizzes	25%	(Midterm: 20%; Quizzes: 5%)
Project	20%	
Final Exam	25%	

I reserve the right to curve (or not) the final course grades. This curve will never decrease your score. I also reserve the right to adjust the final grade of any student based on his/her *class performance* besides the grading items above. This adjustment can be either up or down.

Homework & Labs

There will be approximately 10-12 homework assignments, including lab activities, during the semester. Homework would be written up neatly and **stapled**. Computer code and output should be included as Appendix. Homework assignments are an important component of this course and *each* will count towards your final grade. All homework assignments are due to me at the **beginning** of the class on the due date. Late homework will receive *at most 50 percent* credit.

In the labs, you will work through an activity that supplements the lectures and readings. You are encouraged to work in groups. You can discuss questions and collaborate with each other on solving problems. BUT you must write up your answers on your own as part of your homework. Time in labs may be used on the project, though additional time outside the lab is definitely required.

Exams & Quizzes

We will have one take home midterm probably during the week of March 7-11 and four or five in-class short quizzes. A cumulative final examination will be given during the final exam period.

There are NO excuses for missing an exam or a quiz apart from serious illness, religious conflict or the like. If you have such a conflict, please let me know *in advance* (ASAP). Otherwise, a missing exam is graded a zero. You will not be able to negotiate any missed exams/quizzes at the end of the semester.

Project

You will be required to find a time series data set of your choice (but with my approval) and analyze, model and forecast the series using methods learned in this course. You can either do alone or work in a small group of two. The results of your analysis will be written up in a final report with abstract, body, conclusions, and appendices. More details about the project will be disseminated later.

Intellectual Responsibility

You are encouraged to discuss the homework / lab assignments with others. However, what you turn in must be your own work! **If you work together with other students, I require that you write a note of it on the front of your homework.** If anyone turns in an assignment without such a note and it appears to have been copied from someone else, both students will receive a grade of zero for that homework. As for exams: no talking, no passing signals, no outside help, etc. All cell phones, PDAs, iPods, laptops, etc. should be turned off and put out of sight. Plagiarism on an exam may require further disciplinary actions.

Let me help!

Please let me know ASAP if you would like to discuss any special needs/concerns such as severe academic difficulties, religious observances on certain days, or family emergencies, etc. I'm here to help!

My Expectations for you:

1. Attend every class/lab and be ON TIME.
2. Read appropriate sections of the text/notes BEFORE & AFTER class.
3. Treat HOMEWORK very seriously.
4. Ask questions if you do not understand something or wish to know more.
5. Make it your goal to understand everything we do.