STATISTICS 674: Time Series Analysis II. Spring, 2013.

INSTRUCTOR: Dr. Mohsen Pourahmadi
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TEXT:

1. (Required) *Time Series Analysis and Its Applications with R Examples*, Shumway, R. and Stoffer, D., 2011, New York, Springer. Electronic copy available through TAMU libraries.

2. (Recommended) *Time Series Analysis: Theory and Methods*, P. Brockwell and R. Davis, 1991, New York, Springer.

3. (Recommended) *Time Series Modeling of Neuroscience Data.*, T. Ozaki, 2012, CRC Press.

4. (Recommended) *Foundations of Prediction Theory and Time Series Analysis*, M. Pourahmadi, 2001, New York, Wiley.

PREREQUISITE: STAT 673 Or Equivalent Courses, is strictly required.

FOCUS OF THE COURSE: STAT 674 is for graduate students in statistics and other fields who seek a solid background in advanced theory and methods of **multivariate time series analysis**; it is assumed that all students in the course are familiar with the theory and methods of univariate time series analysis. The course will start with the basic definitions of multivariate stationary processes and multivariate ARMA models. The focus of the course is on state-space models (Chapter 6 of the required text) and statistical methods in the frequency domain such as principal component analysis (PCA) and factor analysis (Chapter 7). Applications of time- and spectral-domain techniques and graphical models to financial, biomedical and neuroscience data will be discussed. Research papers published in the last decade or so will be used to cover emerging techniques and areas of applications of multivariate time series analysis.

Early in the semester, students will be assigned projects and relevant research papers and datasets to study, analyze and present at various times in the course.

GRADE POLICY:

1. One midterm exam worth 100 points will be given in class. There is no final examination.

2. Homework will be assigned regularly and posted on DoStat (Reference and Registration codes are : DS-544 and TSA), it will contribute 50 points to the course. The quality of writing and logical presentation of the arguments leading to a result, not just the correct answer, will contribute greatly to the grade for this part of the course.

3. Project in the course will involve a significant amount of data analysis, reading the relevant literature in the student's area of interest, computational effort, discussion and presentation in class. This is worth 150 points. The final project report should be organized and typed following the format of a research article in statistics or an area of applications. The quality of writing and presentation in class will contribute greatly to the grade for this part of the course.

4. The final course grade will be based on the standard scale where a total of 90 to 100 percent will be an A, 80 to 89 percent will be a B, etc.

5. Attendance and classroom participation are encouraged and will be rewarded, they are integral parts of the learning process .

Other Useful Information:

6. ACADEMIC INTEGRITY STATEMENT: "An Aggie does not lie, cheat, or steal or tolerate those who do." The Aggie Honor Council Rules and Procedures are available at http://www.tamu.edu/aggiehonor.

7. STATEMENT ON PLAGIARISM: As commonly defined, plagiarism consists of passing off as one's own ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

8. STATEMENT ON DISABILITIES: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Disability Services in Room B118 of Cain Hall. The phone number is 845-1637.