STAT:7560 (22S:235)  Time Series Analysis
Fall, 2013

1. Instructor: Kung-Sik Chan  SH 263  335-2849  kung-sik-chan@uiowa.edu
   office hours: MWF 12:00–1:00, or by appointment.

2. Department: Statistics and Actuarial Science
   DEO contact information (Luke Tierney, 241 SH, 335-0712,
   luke-tierney@uiowa.edu)

3. Time and location of class: 8:30am - 9:20am MWF 30 SH

4. Textbooks:
   Time Series Analysis with Applications in R. By Cryer and Chan (2008).
   Topics include: time series regression (chapter 11 of Cryer and Chan,
   chapter 9 of Hamilton), spectrum analysis (chapters 13 and 14 of Cryer
   and Chan), vector ARMAX models (chapters 10, 11 and 13 of Hamilton),
   generalized method of moments (chapter 14 of Hamilton), unit roots and
   co-integration (chapters 15–20 of Hamilton).
   We aim to introduce several topics in time series modeling with emphasis
   on time-series regression and multiple time series. Multiple time series
   analysis provides methods for analyzing the underlying (dynamic) relation-
   shipship between several processes. New insights on the underlying mech-
   anism of the processes may be revealed with multivariate modeling, and
   hence possibly leading to more accurate prediction and control schemes. If
   time permits, we shall also cover the topic of conditional heteroscedascity
   (GARCH type models, chapter 12 of Cryer and Chan),

5. Prerequisite: 22S:156 Applied Time Series Analysis, or equivalent. 22S:
   153 and 154 or equivalent

6. Course requirements:

<table>
<thead>
<tr>
<th>date</th>
<th>percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 1</td>
<td>Oct, 9 (Wednesday)</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Dec, 4 (Wednesday)</td>
</tr>
<tr>
<td>Project report</td>
<td>(to be announced) 2:15 p.m.</td>
</tr>
</tbody>
</table>

Several homework assignments will be given. Discussion with fellow stu-

dents on the exercises of the homework is allowed. Exams are open book.

Each student has to do a project with multivariate time series data with

at least two time-series variables, and present the analysis on a date to

be announced. A one-page proposal outlining the scientific questions to
be addressed and the relevant techniques to be employed, with a separate listing of the data, has to be handed in during class on Nov 22. The final written report should be typed and include a one-page non-technical summary of the findings, followed by the background of the scientific questions, the body of technical analyses with interpretations, a conclusion and the listing of the data. Including graphics, the report ordinarily should not exceed 15 pages in length.

7. Computer package. We shall mainly use SAS and the freeware R for doing computations and model fitting. SAS is available to students at no charge via the virtual desktop at http://cs.its.uiowa.edu/software/sasstudent.shtml. R, with both windows and linux versions, is available in the ITC, and can be freely downloaded at http://lib.stat.cmu.edu/R/CRAN/

8. Grading policy: Your grade for this course will be assigned according to the following approximate scale:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 to 100</td>
<td>A</td>
</tr>
<tr>
<td>75 to 84</td>
<td>B</td>
</tr>
<tr>
<td>65 to 74</td>
<td>C</td>
</tr>
<tr>
<td>55 to 64</td>
<td>D</td>
</tr>
<tr>
<td>0 to 54</td>
<td>F</td>
</tr>
</tbody>
</table>

This scale is not absolute, and the cutoff points may vary depending on the difficulty of the exams. Also, borderline cases may receive a + or −. The College and EPC ask that the A+ grade be used only in extraordinary situations.

9. Students are expected to attend every class unless for documented reasons including sickness or unavoidable circumstances. See http://www.clas.uiowa.edu/faculty/teaching/attendance.shtml for the CLAS policies on attendance.

10. Internet Resources My home-page http://www.stat.uiowa.edu/~kchan/S235.htm provides some links to useful Internet resources related to our course.

11. Miscellaneous:

**Administrative Home** The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook.

**Electronic Communication** University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences. (Operations Manual, III.15.2. Scroll down to k.11.)
Accommodations for Disabilities  A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/sds/ for more information.

Academic Honesty  The College of Liberal Arts and Sciences expects all students to do their own work, as stated in the CLAS Code of Academic Honesty. Instructors fail any assignment that shows evidence of plagiarism or other forms of cheating, also reporting the student’s name to the College. A student reported to the College for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

CLAS Final Examination Policies  Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

Making a Suggestion or a Complaint  Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.

Understanding Sexual Harassment  Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather  In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Public Safety web site.