Statistics 6560: Applied Multivariate Analysis – Autumn 2013

SYLLABUS

Instructor: Tao Shi (taoshi@stat.osu.edu)
Lectures: Tu Th 11:10 – 12:30 in 2019 McPherson Lab
Office: 317 Cockins Hall (CH)
Office Hours: Tu Th 10:00- 11:00 or by appointment

Grader: Yi Lu (lu.647@osu.edu)

Course Description
Statistics 6560 is an introductory multivariate statistical analysis course designed for graduate students in the Department of Statistics. The aim of the course is to introduce a variety of standard statistical methods used to analyze multivariate data, emphasizing the implementation and interpretations of these methods. Topics covered include matrix computation of summary statistics, graphical techniques, the geometry of sample data, the multivariate normal distribution, principal components analysis, factor analysis, canonical correlation analysis, classification/discrimination, as well as cluster analysis if time permits. We will use the R statistical computing environment.

Prerequisites
Statistics 6450 (Applied Regression Analysis) or equivalent, knowledge of linear algebra, and some experience with statistical computing packages are required.

Course Website
carmen.osu.edu (login with your web ID)
Important announcements, course materials, homework problems and solutions, computing references, and other information about the class are posted on the course website.

Textbook
by Richard A. Johnson and Dean W. Wichern (required)

Lectures
Lecture notes will be posted on the course website before class. Please read the sections of the textbook that will be covered, and print out a copy of the lecture notes before class. There will be parts of the notes that you will need to fill in during the lectures, and you may need to take separate notes on examples that are not in the lecture notes. Unless instructed otherwise, you are responsible for all of the material in the sections of the book that are assigned even if some of the material in the book sections is not covered in class. If you are unsure if you are responsible for a particular topic, be sure to ask the instructor.
Computing
We will be using the freely available R statistical computing environment. R is available in the Department of Statistics computing laboratory (note that this facility is only available to Statistics students). Links to websites where R, as well as other reference materials, can be downloaded from the course website in carmen. Most homework assignments will require some computing. Please cut and paste your computer output and graphs into your homework solutions.

Homework and Project Assignments
Homework and Lab assignments will be given through the quarter. You may discuss the problems with each other in general terms, but you must write your own homework solutions and project reports. All sources, including friends and colleagues, must be cited. It is important to get used to a stringent code of conduct in scientific writing. On the other hand, use commonsense and attribute where honesty requires it.

Solutions to the homework problems will be posted on the course website. Late homework assignments will NOT be accepted. Starting and trying to get help early will be helpful. If you are unable to come to class the day a homework assignment is due, please contact the instructor. Re-grade requests on the homework problems must be submitted in writing to the instructor within one week of the day the solutions are posted.

Exams
There will be an in-class midterm given on October 22 (tentatively scheduled). A take home final project will be given at the end of the class.

Grading
The following is a breakdown of the final course grade:

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Final Take-Home Project</td>
<td>25%</td>
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<tr>
<td>Midterm</td>
<td>25%</td>
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<tr>
<td>Homework</td>
<td>25%</td>
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<tr>
<td>Projects</td>
<td>25%</td>
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Special Accommodations
If you need any accommodations based on the impact of a documented disability contact the instructor privately to discuss your specific needs. You should also contact the Office of Disability Services to coordinate special accommodations.

Academic Misconduct
Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with university policy.