

STAT 6560 Applied Multivariate Analysis Autumn 2019

Lecture: MWF 11:30AM–12:25PM in Dreese Lab Room 226

Instructor: Joseph Verducci

Office: 110 Pomerene Hall

Office Hours: MW 12:30-1:25PM or by appointment

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Grader: Qiaolan Deng

Office Hours: Mon 10:20-11:20 and Fri 12:40-1:40 in Cockins Hall 134

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Course web page:

The course has a web page on Carmen (<https://carmen.osu.edu/>). You will find the class schedule, course announcements, homework assignments, and other information about the class on the web page. Please check it out on a regular basis.

Text: *Applied Multivariate Statistical Analysis*, 6th Edition by Richard A. Johnson and Dean W. Wichern (required)

The book is on reserve in the 18th Avenue Library.

Prerequisites: Stat 6450 (Applied Regression Analysis) or equivalent, and Math 2568 (Linear Algebra) or equivalent, and also some experience with the R statistical computing package are required.

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, inferences on a mean vector, principal component analysis, factor analysis, classification/discrimination, as well as cluster analysis and canonical correlation analysis if time permits.

Computing: Students will be required to use the R software environment for statistical computing and graphics. You will be responsible for learning the basics. R can be downloaded for free at <http://www.r-project.org>. Specific R code will be provided for some data analysis. Most homework assignments will require some computing.

Assignments: Homework will be assigned regularly throughout the semester, will be due at the beginning of the class on the dates announced in class, and will be graded. Homework and solutions will be posted on the course web page. For homework assignments requiring computing, properly formatted computer output and graphs should be included with your homework solutions. Computer code must be separately submitted online via Carmen as an appendix to each assignment while a hard copy of your homework (without the code) should be handed in. The code should include comment statements that indicate what sections of the code correspond to the specific homework questions so that, if needed, the grader can read and check your code for its accuracy.

Grading:

Homework: 30%

Midterm: 35% (30% for team leaders*) (tentatively on Friday, November 1)

Final take-home project: 35% (40% for team leaders*)

(to be started one week after the midterm exam and due Friday, Dec. 6)

The final project will involve data analysis with multivariate techniques. It may be done either individually or in a team of up to 4 people. * **If done in a team, a team leader must be identified at the beginning of the project.** The team leader will be responsible for submitting the final report. Each member will be responsible for submitting her/his own draft section(s).

The data set for the project must be approved by the instructor before the Thanksgiving holiday.

Academic Misconduct: Although students are encouraged to work together on assignments, each student is expected to write and submit individual solutions to homework problems. Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with university policy. See the Code of Student Conduct at <http://studentlife.osu.edu/csc/>.

Special Accommodations: Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307; slds@osu.edu; slds.osu.edu.