

Course Information for 22S:161 (STAT:6540)
“Applied Multivariate Analysis”
Spring 2014

Instructor

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Class Hours and Location

9:30 – 10:20 am MWF, 3 SH, January 22 – May 9, 2014 (excluding March 17-21)

Department Executive Officer

Professor Luke Tierney, 241 SH, Phone 335-0712, luke-tierney@uiowa.edu

Dr. Zimmerman’s Office Hours

Tuesday 1:00 pm – 3:00 pm; Thursday 1:30 pm – 2:20 pm; or by appointment

Textbook

The required textbook for this course is *Applied Multivariate Statistical Analysis*, 6th edition, by Richard A. Johnson and Dean W. Wichern. We will cover most of Chapters 1-8 and 11, and briefly touch on Chapters 9 and 10. Reading assignments from the text will be made at the beginning of most class meetings. Abridged lecture notes (as a PDF) for the entire semester will be available for download and printing from Dr. Z’s webpage, during the period from January 20–31, 2012 (Click on the link to “22S:161 Applied Multivariate Analysis” and then on the filename “notes161-2014.pdf”). Lecture notes will cover mostly material in the textbook but will include a few topics not covered at all by the textbook.

Course Prerequisites

22S:152 (Applied Linear Regression) and 22S:158 (Experimental Design and Analysis), or equivalents; and facility with matrix algebra. Note that 22S:152 uses R extensively, and 22S:158 uses SAS extensively, so some familiarity with R and SAS can reasonably be assumed for this course. Also assumed is a little bit of statistical theory, at the level of 22S:120.

Course Objective

To learn some of the basic methods of classical applied multivariate statistics: descriptive statistics, Hotelling’s T^2 -test, multivariate regression and MANOVA, principal components, discrimination and classification, and modeling continuous longitudinal data. Time permitting, we will also learn a little bit about data mining. In addition to learning the methods, it is our goal to learn when and why they are appropriate, what the underlying assumptions are, and how to implement the methods using SAS and R.

Not a Course Objective

To rigorously present the theory underlying statistical methods for multivariate analysis. We offer a more theoretical and advanced treatment of many of the same topics in 22S:256,

Multivariate Analysis (taught spring semesters of even-numbered years). Nevertheless, students taking 22S:161 who do not have command of statistical theory at the level of 22S:120 may struggle.

Exams and Project

- Two 50-minute midterm exams, given in class in early March (covering Chapters 1–5) and mid-April (covering Chapters 6–8). Exact dates will be determined later.
- Two data analysis projects. The first will be handed out in class in early March, and will be due in late March (exact date to be determined later). The second will be handed out in late April and will be due by noon on Wednesday, May 14.

Calculators may be used for exams, and any necessary statistical tables will be provided. If an exam is missed, a make-up exam will be permitted only if the circumstances of missing the exam satisfy university policies. NOTE: There is no in-class final exam; the second of the two projects can be regarded as the final exam, if you wish.

Homework

Written homework assignments are an essential component of the course. Assignments will be given in class every 1-2 weeks, and will usually be due 1 week from the day they are assigned. They will consist mostly of problems from the textbook. Homework assignments and due dates will be given in class and posted on Dr. Z's webpage. Homework not turned in at the beginning of class on the due date will receive at most half credit and will not be graded, unless it is due to circumstances beyond your control. You may work on homework problems together, provided that no outright plagiarism occurs.

Computing

Substantial computing will be necessary to complete the homework assignments and the final project. We will primarily be using SAS but will also use some R. Ample examples using these software packages will be presented in class.

Attendance

Attendance at lectures and participation in discussions are expected. Often arriving late to class, leaving early, or failing to attend class will lower your grade by one-third of a full letter grade (for example, from an A- to a B+).

Grading

- Homework, 20%
- Midterm Exams, 40% (20% each)
- Data Analysis Projects, 40% (20% each)

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

http://www.clas.uiowa.edu/students/academic_handbook/index.shtml

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their standard University of Iowa e-mail address (@uiowa.edu). Students should check this account frequently. (Operations Manual, III.15.2. Scroll down to k.11.)

Academic Fraud

Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Student Academic Handbook.

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.

Accommodations for Students with 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 <http://www.uiowa.edu/~sds/> for more information.

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 at

<http://www.uiowa.edu/~eod/policies/sexual-harassment-guide/index.html>
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,

<http://www.uiowa.edu/~pubsfty/intlinks.htm>