Statistics 6215

Applied Multivariate Analysis

Fall 2016

In ROME 204, W 06:10PM - 08:40PM

Instructor: Dr. Efstathia Bura
Office: 554 Rome Hall
Office Phone: (202) 994-6358
Office Hours: 4:30-5:30 T or by appointment
Department Fax: (202) 994-6917
Email: ebursta@gwu.edu (Preferred means of communication)

Grader: Yun Liang
Email: yunliang2014@gwu.edu
Office Hours: M 4:00-5:00 pm Gelman 210

Multivariate Analysis is concerned with methods of analyzing data that consist of observations on two or more variables for each individual or unit. Multivariate data will generally be correlated, and a wide variety of techniques are available to analyze these data. Many scientific disciplines make use of such techniques for investigating and better understanding large datasets. The course is a mix of theory and hands on application to data with emphasis on practical application and interpretation of results using a range of scientific related examples.

COURSE OUTLINE
Applied Multivariate Analysis comprises of a sequence of two courses at GW: Stat 6215-6216. In the first part, Stat 6215, the following topics are covered:

1. Descriptive techniques
2. Matrix Algebra
3. Multivariate Normal Distribution
4. Theory of Estimation and Inference for Means
5. Simple Multivariate Analysis of Variance (MANOVA)
6. Multivariate Linear Regression Models

COURSE OBJECTIVE
Students after taking this course will

• recognize multivariate data and when multivariate analysis is necessary or may prove beneficial
• know the most widely used multivariate techniques and their theoretical background along with the terminology and mathematical language used to describe them
• know how to use the R statistical software to perform the multivariate analyses discussed
TEXTBOOK

Reference: *An Introduction to Applied Multivariate Analysis with R*, by Everitt and Hothorn.

PREREQUISITES
The desirable prerequisites for the course are: (1) an introductory course in Mathematical Statistics such as 4157-4158 and (2) a course in linear algebra at the undergraduate level or higher (Math 2184).

HOMEWORK
There will be about 6-7 homework assignments, and we will occasionally go over solutions to homework problems. Homework will be collected and graded. Collaboration on homework is permitted and encouraged but each student must submit their own homework paper.

EXAMS
There will be two exams, an in-class midterm scheduled for Monday, October 19, and a final that may be either in-class (last day of class) or take home. Collaboration on the exams is absolutely prohibited. Any students who work together on exams will be given a failing grade in the course.

GRADING
Your final grade will be determined by a weighted average of homework and exam scores: Homework 30%; Midterm 30% and Final 40% (the final will cover the whole course). Students who fail to complete all work will receive a grade based on the work done. Grades of incomplete will be given only in extraordinary circumstances, and only after negotiation with the instructor.

COMPUTING RESOURCES

BLACKBOARD REGISTRATION
Course information and material, including notes, grades, and details about course assignments will be posted in Blackboard periodically. It is the student’s responsibility to check the Stat 6215 Blackboard website frequently for up-to-date information about assignments. Once enrolled in the course, you should automatically be registered on Blackboard. Log into the course website at: [https://blackboard.gwu.edu/webapps/portal/frameset.jsp](https://blackboard.gwu.edu/webapps/portal/frameset.jsp)

ACADEMIC INTEGRITY
I personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the
work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: http://www.gwu.edu/~ntegrity/code.html

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM

DISABILITY SUPPORT SERVICES (DSS)
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: http://gwired.gwu.edu/dss/

UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:
- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals
http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices

SECURITY
In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.