The George Washington University

Department of Statistics
Multivariate Analysis
Stat 265 (Fall 2011)

Instructor: Reza Modarres
Office: 2140 Pennsylvania Avenue (Room 204)
Phone: 202-994-6888
E-mail: reza@gwu.edu
Office hours: Wednesday 5:00-6:00 or by appointment
Class time: Wednesday 6:10-8:40, Statistics Conference room

Course Description:

This course introduces you to the mathematical theory of some statistical methods for analyzing observations on several variables, most likely dependent, following a joint normal distribution. Topics to be covered include characterization and properties of the multivariate normal distribution, conditional distributions, multiple correlation, partial correlation, estimation of the mean vector and the covariance matrix, Wishart and Hotelling distributions and applications to hypothesis testing, discrimination, classification and principle component analysis. Additional topics from the literature will also be covered. The computational aspects will include the use of SAS/IML.

LEARNING OUTCOMES:

As a result of completing this course, you will be able to:

1. Prove the properties of the multivariate normal distribution.
2. Analyze observations obtained from a multivariate normal distribution.
3. Perform multivariate statistical analysis with mathematical derivations.
4. Read, analyze and synthesize further methodology not covered in class.


Grade: Homework 50% (weekly)
Midterm 25% (11/16/2011)
Project 25% (presentation 12/7/2011)

Homework: There will be 8-10 homework sets. You usually have one week to complete each set. Each problem counts for 10 points.

Prerequisite: Stat 201 and 202 (Mathematical Statistics)
Project:

You will read on a topic in multivariate analysis, write a short paper (approximately 10+ pages) and make a 15 to 20 minutes class presentation. Suggested topics include: theory of copulas, tests of independence, tests of exchangeability, multivariate analysis of variance, multivariate Bernoulli distribution, cluster analysis, statistical depth functions, multivariate symmetric distributions, robust multivariate analysis, and multivariate outlier detection. The list is open to other topics. Please discuss your topic with me and provide an outline before the midterm.

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.