This course is designed to continue the techniques of statistical analysis of several variables, most likely dependent, following a joint normal distribution, that you learned in STAT 6215. The main topics we will cover in this course (among others) are:

- Comparisons of Several Population Means
- Multivariate Linear Regression Models
- Principal Components
- Factor Analysis and Inference for Structured Covariance Matrices
- Canonical Correlation
- Discrimination and Classification
- Clustering and Distance Methods

There will be many applications of these multivariate techniques to the analysis of data from the behavioral, social, medical, and physical sciences. SAS programming language will be used and the computational aspects will include heavy use of matrix algebra tools (Proc IML). SAS/IML (Interactive Matrix Language) software is a matrix programming facility for data analysis and manipulation. SAS/IML is a component of the SAS System. You are expected to be familiar with the SAS software. To solve many of the homework problems you will need access to a computer. GW labs provide access to SAS. The University has a site license for SAS.

**LEARNING OUTCOMES:**

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

- Analyze observations obtained from one or more multivariate normal distributions.
- Make inferences about several mean vectors.
- Analyze relationship between multivariate parameters from different populations and make predictions based on that.
- Classify and group multivariate observations into different groups.
- Read, analyze and synthesize further methodology not covered in class.

**Text:** Required: Applied Multivariate Analysis, 6th Ed.,
SAS IML: Check Blackboard
In this course you will take notes, work many homework problems, and take a midterm and a final exam. Make-up exams will not be given unless there is a medical emergency.

**Grade:**  
Homework 50%  
Midterm 25% (March 3, 2015 in class)  
Final 25% (May 5, 2015, 7:40-9:40 PM)  

**Homework:** There will be 5-6 homework sets. A homework set is assigned after each lecture and due one week later, unless otherwise noted. **You must attempt and turn in every problem in every set.** A random sample from each set is selected for grading the entire class. Late submissions will not be accepted. **You are expected to work individually on each problem set.**

**Prerequisite:** Stat 119, 157, 158, 6215 and Math 124

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**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](http://www.gwu.edu/~ntegrity/code.html)

**SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM**  
Disability Support Services (DSS). Contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242. For additional information please refer to: [http://gwired.gwu.edu/dss/](http://gwired.gwu.edu/dss/)

The University Counseling Center (UCC) (202-994-5300) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. See [http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices](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.