

SYLLABUS
STA 4702 and 5701 Applied Multivariate Analysis

Meeting Times: MWF Period 3, Spring 2009
Classroom: TUR 2318

Instructor: Prof. Mary C. Christman, 406 McCarty C, 392-1946, mcxman@ufl.edu
Instructor Office Hours: MWF Period 4 or by appointment

TA: Ji Hyun Song, Griffin Floyd 117A, song.jihyun@gmail.com
TA Office Hours: MW Period 6 or by appointment

Class Website: http://ifasstat.ifas.ufl.edu/STA_47025701/AMA.php

Course Description: This course provides an introduction to multivariate statistics, with an emphasis on descriptive and exploratory methods. We begin the semester with an introduction to vectors and matrices. Introduction to multivariate distributions for vectors and matrices is next. We will cover Hotelling's T-test and multivariate ANOVA. Then, we will move to analyses of interdependence, including methods such as principal components analysis (PCA), multidimensional scaling (MDS), factor analysis and clustering. We will then study canonical correlation and discriminant analysis. If there is time, we will also cover logit choice models, structural equation modeling or other topics of interest to the students. The course is a mix of theory and hands on application to data.

Prerequisites: STA 3024 or STA 4322 or STA 6127 or STA 6167 or STA 4211

Required Text:

Lattin, Carroll, and Green. 2003. *Analyzing Multivariate Data*. Brooks/Cole – Thomson Learning (aka Duxbury Press), Pacific Grove, CA. 556+ pg. ISBN-10: 0534349749 and ISBN-13: 978-0534349745. (New costs around \$150. Used is available for \$50 and up.)

Recommended Texts:

- Morrison. 2005. *Multivariate Statistical Methods, 4th Edition*. Brooks/Cole – Thomson Learning, Pacific Grove, CA.
- Manly. 2005. *Multivariate Statistical Methods, a Primer, 3rd Edition*. Chapman & Hall/CRC, Boca Raton, FL.
- McGarigal, Cushman, and Stafford. 2000. *Multivariate Statistics for Wildlife and Ecology Research*. Springer Science+Business Media, Inc. New York, NY.
- Johnson and Wichern. 2007. *Applied Multivariate Statistical Analysis*. Pearson Prentice Hall, New Jersey, 2007.
- Khattree and Naik. 1999. *Applied Multivariate Statistics with SAS Software, 2nd Edition*. SAS Institute Inc, Cary NC
- Khattree and Naik. 2000. *Multivariate Data Reduction and Discrimination with SAS Software*. SAS Institute Inc, Cary NC.

Copies of most of these are on reserve in the library – they may be under either STA 4702 or STA 5701 so check both.

Grading:

Weekly Homework:	60%
In class quizzes:	10%
Final Project:	30%

Homework: There will be weekly assignments that include both theory questions and a data analysis. Please submit hardcopies of all homework assignments.

In class quizzes: There will be 3-4 randomly scheduled 20 minute quizzes during the semester. The quiz will be given at the start of class. They will not be announced ahead of time and can include any material covered in prior weeks.

Final Project: Students will conduct an analysis of their own or a provided dataset based on one of the presented techniques. The write-up is to be presented in the form of a scientific paper suitable for publication in a peer-reviewed journal. Total length of the writing is 5 double-spaced pages plus bibliography, tables, and figures. In addition, it must have an appendix containing the programming statements used and the output of the analyses.

Your project must be approved by me, so please submit a 1-page proposal of your intended project no later than Friday 6 March. I would also like to arrange a meeting with you individually to go over the data and anticipated analyses after spring break, so please indicate when you are available to meet on your 1-page summary. The final report is due no later than noon Tuesday 28 April but sooner would be appreciated.

Computing: It is assumed that students have access to the internet for purposes of email and web browsing and to statistical computing resources. Homework and the project require familiarity with software that does statistical computations. Examples include SAS, SPSS, JMP, R, S+, or MATLAB. My examples will be mostly in SAS and R but you may use whichever software you are familiar with.

Policies and Additional Information:

1. Office Hours are listed above. Help outside these times are by appointment only. Call or email to schedule an appointment.
2. Occasionally, additional materials or other notes (interesting websites, pointers to recent interesting articles, etc.) will be placed on the class web site. The homework answers will be posted to the website. We will try to post answers quickly.
3. The class Email account will be used occasionally to answer questions or possibly to send out additional information to everyone. Be sure your campus email address is current in the system because we will be using the listserv created by ISIS.
4. Late homework will not be accepted and will be recorded as a 0 grade. If you are going to miss a class or have a scheduling conflict, return the assignment before the due date!
5. It is the responsibility of the student to work all of the assigned homework problems independently (which means by yourself, on your own). The experience gained from doing these problems is invaluable and necessary for the understanding of the material we shall be covering. Please note that obtaining help from fellow students or others on a homework assignment is considered cheating by the University and is not allowed unless I explicitly state that the work is to be done in groups.
6. Missed quizzes are given a grade of 0. No make-ups will be given.
7. We do not give extra credit, so please do not ask. Plan ahead and study so that it does not become an issue.

University Policies:

Academic Dishonesty:

All members of the University Community share the responsibility to challenge and make known acts of apparent academic dishonesty. Acts of academic dishonesty will not be tolerated and will be referred to the Student Honor Council. Information regarding University policies about academic dishonesty and the University's honor code may be found at:

<http://www.dso.ufl.edu/judicial/procedures/academicguide.html>

Academic accommodations:

If you have a documented disability and wish to discuss academic accommodations with me, please contact me as soon as possible. Information on Disability Resources can be found at

<http://www.dso.ufl.edu/drp/services/>

Tentative Schedule:

Week	Topic
1 – 2	Vectors and Matrices
3	Hotelling's T-test of two mean vectors
3 – 5	Principal Components Analysis and Factor Analysis
6	Multidimensional Scaling
7 – 8	Cluster Analysis
9 – 11	Regression and Canonical Correlation
12 – 13	Discriminant Analysis
14	Logit Choice Models