



Multivariate Statistical Methods

Marketing 7626

Spring 2017 | Section 15BC

Thursday (R) 7:25am – 10:25 am (1-3) | HVNR 220

Course Syllabus

Left click links to view.
Right click links to download.

Instructor

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Course Syllabus: http://bear.warrington.ufl.edu/shugan/7626/course_syllabus.pdf

Website: <http://bear.warrington.ufl.edu/shugan/7626/>

Data for Exercises

http://bear.warrington.ufl.edu/shugan/7626/sample_data.xls
http://bear.warrington.ufl.edu/shugan/7626/factor_data.xls
http://bear.warrington.ufl.edu/shugan/7626/regress_data.xls
http://bear.warrington.ufl.edu/shugan/7626/cluster_data.xls
http://bear.warrington.ufl.edu/shugan/7626/mds_data.xls
http://bear.warrington.ufl.edu/shugan/7626/planes_data.xls

Textbook

Multivariate Data Analysis, 7th edition by Joseph F. Hair, William C. Black, Barry J. Babin, Rolph E. Anderson, Prentice-Hall: Upper Saddle River, N.J., ISBN: 0138132631

Lecture Notes and Handouts are available in class or on course website

Software

We focus on research design and analysis rather than software. You can use many different software packages to complete the course assignments. Any advanced statistical software available at your department is acceptable for homework assignments. However, class examples will use SPSS Statistics GradPack™ for Windows, which is a full version of the SPSS software (SPSS Base, SPSS Regression & SPSS Advanced Statistics)

See:

<http://www-01.ibm.com/software/analytics/spss/>

The software should be available at the University of Florida Bookstore at the Reitz Union or online (usually on a time-limited license) at:

<http://www.onthehub.com/spss/>

Classroom examples will use SPSS Statistics GradPack™ for Windows. **Do not confuse this software with the Business Version or Student versions** – neither version is useful for this class. The appropriate software includes the Multivariate General Linear Model. Version 13.0 and newer include Amos that estimates structural equation models.

Course Content

This course covers basic multivariate data analysis with an emphasis on applications for business, marketing research and consumer behavior. The course is an introductory survey that compares and contrast many different multivariate techniques. The course emphasizes applications of multivariate analysis from a conceptual viewpoint as well as research design. IT IS NOT A COURSE ON STATISTICAL SOFTWARE. Moreover, very little class time is devoted to software and students are free to use different software packages.

This course is NOT a mathematical development of multivariate statistical techniques and, as noted, it is not a programming course on using statistical packages. In contrast, the course emphasizes the design of a multivariate research project, the choice of a multivariate method, the testing of the fundamental assumptions underlying various multivariate methods, the validation of a multivariate analysis, the important issues involved in evaluating the quality of a multivariate data analysis and interpretation of the results.

This course provides an overview of multivariate methods, differences between the methods and the application of these methods in the academic literature. The course covers a large number of multivariate methods used in social sciences including:

Approaches for missing data Analysis of Outliers Multiple Regression Analyses Multiple Discriminant analyses Canonical Correlation	Multivariate Analysis Of Variance Factor Analysis Cluster Analysis Multidimensional Scaling Conjoint Analysis Structural Equation Modeling Logit Models
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Course Objectives

- *To introduce different methods for multivariate data analysis*
- *To explain how to match multivariate techniques with research objectives*
- *To test the assumptions and interpret the results of a multivariate analysis*
- *To understand the issues in the estimation and validation of a multivariate analysis*
- *To understand research employing various multivariate techniques*

Student Evaluation

70%	I give announced quizzes at the beginning of class throughout the semester to encourage students to keep up with the course work. I drop the lowest grade. A missed quiz receives zero points. There are NO make-up quizzes!
10%	Exercises involve the estimation of a multivariate model on a dataset, obtaining the results and interpreting those results (pass/fail).
10%	The article critique should provide a critical review of the statistical analysis in a published article in a respected scholarly journal. The article must include an analysis employing one of the statistical techniques covered in MAR 7626.
10%	The presentation of the critique

Article Critiques

Articles critiques should focus on the quality of the methodology or analysis and **NOT** the contribution or substantive findings of the article. Assignments only get full credit when completed by their respective deadlines. Students **MUST COMPLETE ASSIGNMENTS BY THEIR DEADLINE**. The article-critique should provide a comprehensive critique of the statistical analysis employed in a selected research article. Article critiques should be no more than 4000 words but may include appendices beyond that word limit. However, the appendix should only supplement the body of the paper and should not include stand-alone items. For example, the appendix might include a table that supports statements made in the body of the paper or the appendix might include an explanation for a statement made in the body of the paper. The body of the paper should refer to the appendix as necessary.

All revised research articles **MUST BE** publications in respected scholar journals and each publication must include a detailed analysis of at least one of the statistical techniques covered in this course. **You MUST** include a copy of the published article with your written article critique.

Articles critiques **SHOULD NOT** be a summary of the research article. Articles critiques should:

1. Clearly state and comment on the research objective or research question of the published article (was the research objective clear?).
2. Evaluate the approach the article uses to answer that research question (provide strengths, weakness, and, if possible, suggestions for improvement).

3. Evaluate the quality of the data.
4. Evaluate the suitability of the statistical methods for analyzing that data.
5. Evaluate the application of the statistical method including the testing of assumptions, the decisions made when analyzing the data (e.g., options employed) and the rigor of the application.
6. Evaluate any alternative analyses used to achieve the research objective.
7. Evaluate the "statement of the findings". Did the empirical analyses support the stated findings? Comment on any speculations made that might not be justified by the empirical analyses.
8. Evaluate any limitations of the research.
9. Evaluate the clarity and completeness of the presentation. (Did the article provide all the important information that the reader needs?)
10. Provide any suggestions for possible improvement.

Here are some additional references on how to review an article.

[Link 1](#) How to Review an Article

[Link 2](#) How to Review an Article

[Link 3](#) How to Review an Article

[Link 4](#) How to Review an Article

[Link 5](#) How to Review an Article

[Link 6](#) How to Review an Article

[Link 7](#) How to Review an Article

[Link 8](#) How to Review an Article

Quizzes

There are 5 quizzes given over the semester. I drop the lowest quiz grade, so there is no need for a make-up quiz. I design quizzes to enhance and reward the mastery of the material from the textbook and class sessions. Quizzes usually emphasize recent lectures but quizzes can contain past material as well.

SAMPLE QUIZ 1

SAMPLE QUIZ 2

SAMPLE QUIZ 3

SAMPLE QUIZ 5

Presentations

The course requirements include one oral presentation of the assigned article critique.

Course Outline

Week	Date	Due Dates.	Chapter	Assignments & Lecture Notes (on website)
			Section One -- Preparing to Apply Multivariate Analysis	These assignments are in ADDITION to reading the corresponding textbook chapters.
1	1/5/2017		Ch.1: Overview of Multivariate Methods	Multivariate Analysis Note
2	1/12/2017		Ch.2: Examining Your Data & Multivariate Relationships	Multivariate Relationships Note
3	1/19/2017		Ch.3: Exploratory Factor Analysis	Exploratory Factor Analysis Note XLS
			Section Two -- Dependence Techniques	
4	1/26/2017	Quiz 1	Ch.4: Multiple Regression	Multiple Regression Analysis Note XLS
5	2/2/2017		Ch.5: Multiple Discriminant Analysis	Multiple Discriminant Analysis Note XLS
6	2/9/2017	Quiz 2	Ch.6: Logistic Regression	Logistic Regression Note XLS
7	2/16/2017		Canonical Correlation Analysis Book Chapter	Canonical Correlation Analysis Note XLS
8	2/23/2017	Quiz 3 Exercise 1 Due	Ch.7: MANOVA and GLM	MANOVA and GLM Note XLS
9	3/2/2017 (no class)		Ch.8: Conjoint Analysis	Conjoint Analysis Note XLS
10	3/9/2017		Spring Break	
			Section Three -- Interdependence Techniques	
11	3/16/2017	Quiz 4	Ch.9: Cluster Analysis	Cluster Analysis Note XLS
12	3/23/2017		Ch.10: Multidimensional Scaling Ch.12: Structural Equations Modeling Overview	Multidimensional Scaling Note XLS
			Section Four -- Moving Beyond the Basic Techniques	
13	3/30/2017	Exercise 2 Due Quiz 5	Structural Equations (continued)	Structural Equations Modeling Note XLS
14	4/6/2017		Mediator vs Moderator variables/ Student presentations (depending on class size)	XLS OLD
15	4/13/2017	Critique due	student presentations	

Lecture Notes on Course Website <http://bear.warrington.ufl.edu/shugan/7626/>



Description of HATCO Database Variables

The data are available at:

<http://bear.warrington.ufl.edu/shugan/7626/hatco-data.xls>

You should be able to open the file by: launching Microsoft Excel, going to the File menu, going to the open sub-menu and typing the preceding line into the file-name box. Of course, you must have an internet connection.

The format of the excel file is:

Variable	Perception/Purchaser Characteristic	Variable Description	Variable Type
X1	Perception	Delivery speed	Independent/Metric
X2	Perception	Price level	Independent/Metric
X3	Perception	Price flexibility	Independent/Metric
X4	Perception	Manufacturer's Image	Independent/Metric
X5	Perception	Overall service	Independent/Metric
X6	Perception	Salesforce's image	Independent/Metric
X7	Perception	Product quality	Independent/Metric
X8	Purchaser Characteristic	Size of firm	Independent or Dependent/Nonmetric
X9	Purchase Outcome	Usage level	Dependent/Metric
X10	Purchase Outcome	Satisfaction level	Dependent/Metric
X11	Purchaser Characteristic	Specification buying	Independent or Dependent/Non-metric
X12	Purchaser Characteristic	Structure of procurement	Independent or Dependent/Non-metric
X13	Purchaser Characteristic	Type of industry	Independent or Dependent/Non-metric
X14	Purchaser Characteristic	Type of buying situation	Independent or Dependent/Non-metric

X1-X8: Perceptions of HATCO A scale from 0 (Poor) to 10 (Excellent) was used.

X8: Size of firm 1 = large; 0 = small

X9: Purchase Outcomes

Usage level -- how much (0 to 100%) of the firm's total product is purchased from HATCO

X10: Satisfaction level Scale from 0 (Poor) to 10 (Excellent)

X11: Specification buying 1 = total value analysis; 0 = specification buying

X12: Structure of procurement 1 = centralized; 0 = decentralized

X13: Type of industry 1 = Type A; 0 = other

X14: Type of buying situation -- 1 = new task; 2 = modified rebuy; 3 = straight rebuy

University of Florida Policies

Academic Honesty: Our online classes are subject to the same guidelines of academic honesty as on-campus classes. Please carefully review and be familiar with the Student Honor Code, which is at <http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>. All UF students are bound by the Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code, and the possible sanctions. Furthermore, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult the dean of students.

Special Note on Plagiarism: Plagiarism is presenting another's work as your own. Cheating and plagiarizing are against the University of Florida Student Conduct Code and are not tolerated. Every course submission may be checked via Turnitin.com (<http://www.turnitin.com>), an online service that compares documents with each other, webpages on the Internet, and other past assignments. If portions of your document were copied from another student's assignment (past or present) or from a World Wide Web page, that constitutes plagiarism. Any form of plagiarism investigated as set out by the University of Florida Student Conduct Code. Procedures on investigations can be found at: <http://www.dso.ufl.edu/judicial/>. Students in this course caught cheating or plagiarizing receive a failing grade and are prosecuted in the UF Honor Court. UF policies require you to create original work for each course.

Late/Make up policy: This syllabus informs students of all deadlines. Waiting until the last minute to begin working may risk last minute difficulties that are not an excuse for late submissions. Please do not procrastinate. Late assignments and missed quizzes receive no credit. Deadlines are firm: No extensions or makeups are allowed.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Please refer to the following websites: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>
<http://shcc.ufl.edu/forms-records/excuse-notes/>
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Course Evaluation: Students should provide feedback on the quality and administration of this course based on 10 criteria. Evaluations are conducted online at <https://evaluations.ufl.edu>. Usually evaluations are done during the last two or three weeks of the module, but students are given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>."

Students with Disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

Cell phones and computers: Cell phones must be muted during the class session. If an emergency call or text requires an immediate response, please leave the classroom. Computers (iPads or other electronics) are allowed for note taking and presentations only. I will ask anyone using a computer for any other purpose to surrender the device to me for retrieval after class. Recording the class requires my permission because some materials are copyrighted.

Attendance: Please avoid joining the class after the calls as started. Attendance is not required but class participation can influence the final grade.

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Help with Coping: Many resources are available for students who need help with stress-related problems or emergencies. Assistance is available both by appointment and after hours by calling 352-392-1575 or visiting the UF Counseling and Wellness Center at 3190 Radio Road on campus <http://www.counseling.ufl.edu/cwc/>

Emergencies: Contact the University Police Department: 392-1111 or 9-1-1 for emergencies.

Extra Credit: No extra credit is available, no matter the circumstance. However, I may consider class in board-line cases.

Flexibility: I reserve the right to adjust the course content, exercises, exams, etc., based on the class's collective ability to maintain pace and any unforeseen circumstances.