

# Multivariate Analysis in Applied Psychological Research

Primera Casa (PC) 419

Wednesday 9am – 11:45am

**Instructor** Stefany Coxe, Ph.D.

**Office:** DM 275

**Office hours:** by appointment

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**Website:** <http://faculty.fiu.edu/~scoxe>

## Course Description

Basic techniques of multivariate analysis, emphasizing the rationale and applications to psychological research. Includes multiple regression, MANOVA, principal component analysis, and factor analysis.

**Goals of the Course:** (1) Familiarize you with classic multivariate statistics, (2) Make sure that you understand how to actually conduct these analyses, (3) Prepare you for further study in applied statistics, (4) Give you enough background to understand current applied statistics research

## Statistical Background

Graduate coursework in analysis of variance and linear regression. We will cover a variety of topics in this course, but all of them build on a basic ANOVA and regression (general linear model) framework. I do not expect you to have taken SEM or other advanced courses.

## Textbook

*The Essence of Multivariate Thinking*, 2nd edition (2014), by Lisa L. Harlow

ISBN: 978-0415873727

**Other readings:** I will post relevant articles to Blackboard on an as-needed basis.

## Software

We will use both SPSS and SAS in this course. Each package has strengths and weaknesses, so you will want at least a basic understanding of both. I will provide you with information to get started in SPSS and SAS, as well as information about specific analyses we will cover in this class. You will need to access either SPSS or SAS outside of class to complete assignments.

## Blackboard

Course materials (lecture notes, computer code, and assignments) will be posted on the Blackboard site for the course. You should bring lecture notes and other materials to class. Please note that the lecture notes are not complete – you will also need to take notes in class and consult the textbook.

## Teaching Assistant

Our teaching assistant is Sarah Helseth. You can contact her at [shelseth@fiu.edu](mailto:shelseth@fiu.edu)

## Assignments and Course Grade

### Homework

- Five homework assignments.
- Homework should be completed before class begins.
- You will need to access SPSS and/or SAS to complete the homework assignments.
- You will also need to do some mathematical calculations by hand, depending on the assignment.
- Homework due dates are September 10, October 01, October 22, November 12, December 03.

### Quizzes

- Five in-class quizzes on the day each homework assignment is due.
- I will give you output or other information and you will need to interpret the results or otherwise comment on the material.
- You may have to do some mathematical calculations, but they will be minimal.
- Quizzes are at the beginning of class on September 10, October 01, October 22, November 12, December 03.
- You will have 1 hour to complete each quiz before lecture, so it is in your interest to be punctual!

### Final Grade

Homework assignments will comprise 50% of your grade; in-class quizzes will comprise the other 50%.

Letter grade	Percentage
A	$\geq 93$
A-	90 - 92.99
B+	87 - 89.99
B	83 - 86.99
B-	80 - 82.99
C+	77 - 79.99
C	73 - 76.99
C-	70 - 72.99

There are no plans for make-up homework or quizzes.

## Course and University Policies

### Attendance

I shouldn't have to tell you to attend every class. This is graduate school.

Legitimate, verifiable cases of illness and emergencies, religious holy days, and conference travel can be accommodated. You need to contact me as soon as possible to make arrangements.

### Drop Dates

Tuesday, September 2: Last day to drop courses or withdraw from the University without incurring financial liability for tuition and fees

Monday, November 3: Deadline to drop a course with a DR grade

### Special Needs

Any student with a disability or other special need that may require special accommodations for this course should make this known to the instructor during the first week of class.

Disability Resource Center

Graham Center (GC) 190

(305) 348-3532

drcupgl@fiu.edu

drc.fiu.edu

### Academic Misconduct

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and to honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

### Academic Dishonesty

Please refer to your student handbook for a description of what constitutes academic dishonesty.

NOTE: Anything on this syllabus is subject to change at the Instructor's discretion.

## Tentative Course Outline

Date	Topics	Assignments	Reading
Aug 27	Introduction, Matrix algebra 1		1, 2, Supp 1
Sep 03	Software, Linear regression		3
Sep 10	Linear regression (matrix)	HW1 due, Quiz 1	3
Sep 17	Linear regression (matrix)		3
Sep 24	Analysis of covariance (ANCOVA)		4
Oct 01	Maximum likelihood	HW2 due, Quiz 2	Supp 2
Oct 08	Missing data		Supp 3
Oct 15	Matrix algebra		Supp 1
Oct 22	Principal components analysis (PCA)	HW3 due, Quiz 3	9
Oct 29	Factor analysis (FA)		9
Nov 05	Factor analysis (FA)		9
Nov 12	Multivariate ANOVA (MANOVA)	HW4 due, Quiz 4	5
Nov 19	Logistic regression		7
Nov 26	Discriminant function analysis (DFA)		6
Dec 03	TBD	HW5 due, Quiz 5	TBD
Dec 10	NO FINAL EXAM		

Supplementary readings will be available on Blackboard

Supp 1: Tabachnick & Fidell, Appendix 1

Supp 2: Enders (2005)

Supp 3: Baraldi & Ender (2010)