

PSCH 727-824-827
Analysis of Variance & Experimental Design
Course Syllabus

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Lab Instructor: Ashley Doane, M.S.
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Lecture : Monday/Wednesday 4:20-5:35 PM, MGB 128
Laboratory : Wednesday 6:00-8:00 PM, BAL 1015 (40 lab)

Required Text: Maxwell & Delaney (2004). *Designing Experiments and Analyzing Data: A Model Comparison Perspective* (2nd ed). Lawrence Erlbaum: Mahwah, NJ.

Recommended: American Psychological Association. (2009). *Publication Manual of the American Psychological Association* (6th ed). Washington, DC

Undergraduate Statistics textbook for review and reference such as:
 Graveletter & Wallnau (2005). *Essentials of Statistics for the Behavioral Sciences* (5th Edition). Thomas Wadsworth: Belmont, CA.

Supplies : A basic pocket calculator (needs a square root function)
 Computer data storage device (e.g. thumb drive or university hard drive)
 College rule loose-leaf notebook paper (exercises)
 Graphing paper (for exercises)
 Three ring binder (for Laboratory Log)

Course Goals:

This course will provide students with a review of basic statistical concepts as well as in-depth coverage of experimental design and data analysis techniques. Students will have the opportunity to gain both a theoretical understanding of the logic of null hypothesis significance testing and practical experience with the analysis of experimental data using SPSS software.

Note that the goal now, in this class, is *not to master* each of these topics. It is impossible to master any one of these topics by reading a book, completing a few examples, or listening to a lecture. Expertise in design and analysis comes with practice and experience. The goal here is to begin to gain experience with the logic of experimental design and the techniques for analyzing data from these designs. Success in this course will give you the understanding you need to begin developing research ideas, work with the type of data common in psychological research, comprehend primary source research articles, and continue to develop your own expertise in this area. This course will also prepare you to learn other statistical techniques that are based on the logic of hypothesis testing and the General Linear Model such as correlation, regression, multivariate analysis, and factor analysis.

Research design and statistical analysis are the primary tools used by psychologists in all fields to progress our theoretical and practical understanding of the mind and behavior. Furthermore, practical knowledge of research design and analytic techniques is one of the most important and marketable skills for individuals with advanced degrees in psychology, both in academia and the private sector. Therefore, putting in the work to gain a clear understanding of the material presented in this course at this point in your career will pay off for you many times over in the future.

Blackboard & Email:

Course materials (assignments, handouts, additional readings, etc.) will be accessed via Blackboard <http://blackboard.odu.edu/>. Students must activate their ODU email accounts in order to access Blackboard. Students will also receive class announcement via blackboard and their university email accounts. It is recommended that you use your university email account for all ODU related activity. Using other email accounts for university related business runs the risk of the message you send to your colleagues or professors ending up blocked by there spam filtering program. It is also recommended that you activate the universities spam filtering program on your account to help keep your university email functional and free of unwanted messages. For more information see <http://www.occs.odu.edu/accounts/spamtrap/> .

Readings & Lecture:

Each week's topic is associated with a chapter in the required text. This book is very well written and will be a great aid in your studies and a great reference in your future research. Therefore, it is expected that you will come to class having read the assigned chapters. The lecture and text are meant to complement each other, *not* to repeat each other. So, there may be aspects of the text that you will need to know that are not explicitly covered in class and vice versa. Furthermore, lectures will be designed under the assumption that you have read and understood the chapter. Therefore, failing to read the chapter before class will leave you unfamiliar with key concepts and terminology that we will be exploring in more depth in the lecture. Finally, the structure of the lecture portion of the class will be designed to be an interactive experience where we will be discussing issues, answering questions, and clarifying difficult concepts. If you do not come to class prepared, you will not be able to understand the lectures or participate in the discussions. In conclusion, in order to be successful in this course you will need to read the book, follow along with the examples, and work out the practice problems *before* the lecture each week and come to class prepared with clarification issues and questions that you would like to discuss.

Laboratory Exercises:

The weekly laboratory section of the course will be designed to give you a structured environment to gain hands-on experience with the concepts and techniques discussed in lecture. Laboratory work will focus on applying the techniques learned in class on realistic data sets and drawing conclusion based on these analyses. The laboratory will be designed to offer a supportive and collaborative atmosphere where you can develop your skills under the guidance of a trained and highly qualified graduate student instructor. You will be asked to compile an organized and detailed record of all lab exercise work (called a lab log) which will be assessed for completeness at the end of the semester. This lab log will be used to assess your performance in lab and will serve you as an invaluable reference in your future research endeavors.

Exams & Data Analysis Projects:

Since the goal of this course is to gain both a theoretical understanding of experimental design and analysis, and a practical proficiency applying these concepts and techniques, the primary tools for assessment in this course will reflect both of these goals. There will be two examinations (Mid-term & Final), which will primarily focus on your conceptual and theoretical understanding of the lecture material. These exams will be completed in-class and each will account for 25% of your final grade. There will also be six Data Analysis Projects assigned during the semester. These projects will ask you to analyze, interpret, and present in APA style the results from data sets which represent different types of experimental designs. These six projects will be designed to assess your practical understanding and ability to correctly apply the concepts learned in the lecture and laboratory. These assignments will be completed individually, outside of class, and will each account for 5% of your final grade.

ATTENDANCE:

Each topic in this course builds directly from the previous one and the examples used in class tend to extend from one lecture to the next. Furthermore, we will be covering things in class that may not be explicitly covered in the book. Therefore, if you miss a lecture you will be COMPLETELY LOST in the next lecture. So, do not miss class. If you do miss class, be sure to get the notes from someone immediately and check the blackboard for any class announcements. As per university policy, students are expected to attend all classes. That being said, we are all adults here and I will not be taking attendance in lecture or offering points for attendance. As advanced students, class attendance and participation are the minimum expectation for acceptable performance. If you fail to attend lectures and actively participate in discussions, you will have a very difficult time meeting the goals of this course.

Attendance will be taken for the laboratory portion of the class because laboratory exercises are designed to be in-class collaborative activities. Therefore, you cannot participate in the activity if you do not attend the laboratory. You will not receive credit on your Laboratory Log assessment for any laboratory exercises for any lab class that you did not attend.

HONOR PLEDGE:

The Honor Code of ODU shall be abided by. The Honor Pledge is as follows:

“I pledge to support the Honor System of Old Dominion University. I will refrain from any form of academic dishonesty or deception, such as cheating or plagiarism. I am aware that as a member of the academic community it is my responsibility to turn in all suspected violators of the honor code. I will report to a hearing if summoned.”

No form of academic dishonesty will be tolerated. Without exception, any student who breaks the University’s code of academic integrity will receive an automatic “F” for the course and will be the subject of formal charges.

University’s policies for academic dishonesty: <http://studentaffairs.odu.edu/osja/academicdishonesty.shtml>

SPECIAL NEEDS STUDENTS:

In compliance with PL94-142 and more recent federal legislation affirming the rights of disabled individuals, provisions will be made for students with special needs on an individual basis. It is the student's responsibility to request assistance as soon as possible from Disability Services before any accommodations can be furnished. Reasonable accommodations are arranged in the spirit of equalizing opportunity and are based on the student's individual documentation. Documentation of a disability must meet the established guidelines which are available from the Office Disability Services. Contact Info: 1525 Webb Center, Phone: 757-683-4655, Webpage:

<http://studentaffairs.odu.edu/disabilityservices/about.shtml>

GRADES:

Your final grade will be calculated as follows.

Lab Log (2 X 10%)	20%
Data Analysis Projects (6 X 5%)	30%
Mid-Term Exam	25%
Final Exam	25%

This score will translate into letter grades using the following scale:

	100-93%= A	92-90% = A-
89-88% = B+	87-83% = B	82-80% = B-
79-78% = C+	77-73% = C	72-70% = C-
	Below 70% = F	

Course Schedule:

Week	Date	Lecture	Reading
1	31-Aug	Design & Analysis	Chapter 1-2
	2-Sep	Review of Basic Statistics	Tutorial 1 Basic Stats
2	7-Sep	No Lecture Labor Day	
	9-Sep	Review of Basic Statistics Continued	
3	14-Sep	One way Between-Subjects Designs	Chapter 3
	16-Sep	One way Between-Subjects Designs Continued	
4	21-Sep	Comparisons of means	Chapter 4
	23-Sep	Comparisons of means Continued	
5	28-Sep	Contrasts	Chapter 5
	30-Sep	Contrasts Continued	
6	5-Oct	Trend Analysis	Chapter 6
	7-Oct	Trend Analysis Continued	
7	12-Oct	NO CLASS FALL BREAK	
	14-Oct	Factorial Designs	Chapter 7
8	19-Oct	Factorial Designs Continued	
	21-Oct	Higher Order Factorial Designs	Chapter 8
9	26-Oct	Higher Order Factorial Designs Continued	
	28-Oct	Designs with Covariates	Tutorial 2 Regression Chapter 9
10	2-Nov	Designs with Covariates Continued	
	4-Nov	Designs with Random or Nested Factors	Chapter 10
11	9-Nov	Designs with Random or Nested Factors Continued	
	11-Nov	Within-Subjects Designs	Chapter 11
12	16-Nov	Within-Subjects Designs Continued	
	18-Nov	Within-Subjects Factorial Designs	Chapter 12
13	23-Nov	Split plot Factorial Designs	
	25-Nov	NO CLASS: Thanksgiving	
14	30-Nov	Split plot Factorial Designs	
	2-Dec	Power Analysis	Readings from Blackboard
15	7-Dec	Power Analysis	
	9-Dec	Catch-up and Review	

Laboratory Schedule and Assignment Due Dates:

Week	Date	Laboratory	Assignment
1	2-Sep	Sigma Notation & Descriptive Stats	
2	9-Sep	SPSS Introduction (Descriptive Statistics, t-tests, & ANOVA)	
3	16-Sep	Reporting results, APA style, tables, & Graphs	
4	23-Sep	SPSS Post-hoc & comparisons	Data Analysis 1
5	30-Sep	SPSS Contrasts	
6	7-Oct	Trend Analysis	Data Analysis 2
7	14-Oct	Mid-term exam	Laboratory Log 1
8	21-Oct	SPSS Factorial ANOVA	
9	28-Oct	SPSS Factorial ANOVA Interactions	Data Analysis 3
10	4-Nov	SPSS ANCOVA	
11	11-Nov	SPSS Random/ Nested Factors	Data Analysis 4
12	18-Nov	SPSS Within-Subjects	
13	25-Nov	No Class Thanksgiving	Data Analysis 5: due in lecture on Monday Nov 23.
14	2-Dec	SPSS Split-plot Design	
15	9-Dec	Power Analysis	Data Analysis 6
Final Exam	14-Dec	Final Exam 3:45-6:45 PM in MGB 128	Laboratory Log 2

While we fully expect to follow this schedule, unexpected circumstances may occur. Therefore, all dates are subject to adjustment. It is your responsibility to attend class and observe class announcements concerning any change in schedule or due dates.