ERSH 8310, Fall 2007
Analysis of Variance Methods in Education
Syllabus

Professor
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Office Hours
Tuesday and Thursday, 2pm – 3pm, and by appointment.

Online Communications
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Course Information
Lecture: Tuesdays and Thursdays, 5:00 pm – 6:15 pm; 625 Aderhold Hall

Course Objectives
This course is intended to be an *applied* statistics course, meaning all statistical topics will be taught in an application-centered manner. I have two goals for students of this course:

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(1) To become knowledgeable consumers of the statistical methods presented in this course.
(2) To be able to properly obtain and use the statistical methods presented in this course.

It is my philosophy that becoming knowledgeable about applied statistical techniques does not require your understanding or recitation of intricate mathematical proof. Rather, becoming knowledgeable revolves around the fundamental properties of each method:

- The situational appropriateness and motivation.
- The inferences that can be made from the technique.
- Methods of obtaining statistical estimates (including statistical computing).
- Knowledge of the underlying assumptions (and how to test if these are violated).

To reach these goals, lectures will feature some examples, and students will have frequent opportunities to practice what has been taught.

Be advised – this course will challenge you, and will require a significant amount of work. At the end of the class, however, you will be able to apply modern statistical methods in many situations.

Required Textbook

Keppel, G. & Wickens, T. D. (2004). Design and Analysis: A Researcher's Handbook, 4th Ed. New Jersey: Pearson.

Huck, W. W. (2003). Reading Statistics and Research, 4th Ed. Reading, MA: Longman.

Green, S. B., Salkind, N. J., & Akey, T. M. (2007). Using SPSS for Windows: Analyzing and Understanding Data, 5th Ed. New Jersey: Prentice Hall.

Statistical Computing

Application of the methods taught in this course will implemented using SPSS as the primary statistical package. SPSS is an easy-to-use package that will be accommodate all of the material to be presented this semester. If you are already familiar with another package, you may use that package. Be advised that all examples and solutions will feature SPSS, and I cannot provide you any help with any other package.

SPSS is available to you in three ways:

1. You can purchase SPSS through UGA's MSD at https://www.msd.uga.edu/catalog/product_items.php?product_id=1177.
2. The computer lab in room 616 Aderhold and various labs throughout campus have SPSS installed on all computers. For a list of College of Education maintained labs and hours visit http://www.coe.uga.edu/oit/instruction/labclass/labspecs.html.

Course Website/Technology

This course will feature extensive use of WebCT. All necessary information will be posted on WebCT, which is accessible to students who have registered for the course at http://webct.uga.edu.

Course Grading System

The final grade will be determined based on the weighted average of the homework assignments, and the two tests using the following weights:

Homework	35%
Test 1	20%
Test 2	20%
Final	25%

Course grades will be determined by the weighted average of the homework, midterm, and final grades, and will be given according to the following scale. I reserve the right to round grades upward in the event I misjudge the difficulty of the course, but grades will never be rounded downward.

My goal is for everyone to succeed in this course, learn the material, and receive an A. Here is a rough picture of the grading scale I will use:

Percentage of Points	Grade
100-90	A
89-85	A-
84-80	B+
79-75	B
74-70	B-
69-65	C+
64-60	C
59-55	C-
54-50	D
Below 50	F

Academic Honesty

All students are expected to abide by the University of Georgia student honor code. You can view the UGA academic honesty policy at http://www. uga.egu/ovpi.

Course Structure

Homework

Homework is your time to learn the material with heavy guidance from the instructor. This course will feature frequent homework assignments to allow for sufficient practice of the ideas and statistical techniques discussed. A typical assignment will consist of a set of practice problems, expected to be completed within one week. All assignments will be posted online, and the homework is expected to be completed by the beginning of class on the due date.

Late homework will not be accepted for credit. To allow a bit more flexibility in the work requirements of the course, the lowest homework score will be dropped. Homework must be completed free of computer output, with the exception being computer-drawn *figures* (graphical displays of data, not tables). Any computer output included on your homework will make the grade for the *entire* assignment a zero. Instead of supplying output, supply **only** the requested information. Consider this practice for writing reports and journal articles (and your midterm and final) – condensing the important pieces of information from the stat package is part of learning how to receive and report statistical analyses.

Provided there is no computer output in your homework, a random set of problems will be graded on a 3-point scale. The points received divided by the total points possible will be your homework percentage for any given week. Each week's homework will count the same weight toward your final grade (i.e. weighted averages will be used).

Homework Grading Scale

Points	Expectation
3	Answer is correct and concise. You demonstrate you know the content area
2	Effort is made, but answer has some errors. You show you are on the right track and trying.
1	Minimal effort for the problem. You do not demonstrate you know the concepts.
0	No answer given (or verbatim computer output included in the answer)

Tests

There will be two in class tests and an in class final, all being in multiple choice format. The exams will cover material in the assigned readings and lectures up to and including those preceding the exam. The final will be comprehensive, with greater emphasis on the second half of the course.

Collaboration with Other Students

Students are allowed and ***encouraged*** to collaborate with each other on the statistical analysis portion of the homework assignments. However, each student must turn in an ***original*** piece of written work. The motivation for such a rule is to mimic the situations you find outside of this classroom. Often, statistical analyses are conducted in collaboration with other researchers. However, scientific and technical writing are skills that all researchers must have, and as such, are part of the experience in this course.

Any text that is deemed to be not original (text that is copied or simply a re-wording or paraphrasing of another student's work) will be considered not original for any of the parties involved.

Course Style and Content

Lecture Format

Most lectures will have notes (slides) available digitally, with slides available online the morning of the lecture. Please check WebCT before coming to class if you would like to bring a printout of the slides with you. If nothing is on WebCT, then we will be having lecture from the old-fashioned chalkboard. If you have a data set you would like to see included in the in-class examples, I encourage you to submit it to me. I strongly encourage you to participate in lecture by asking questions whenever anything is unclear.

Reading Assignments

To be fully successful in this course, I **strongly** encourage you to read the assigned chapter(s) prior to the course when we will cover the topic. Even if you have difficulty reading the material, exposure to the information prior to lecture will aid in your understanding of the course.

How to Succeed in this Course

- Read the assigned chapters (even if it doesn't make sense to you – it will eventually).
- Come to class and lab (we'll be interpreting the book).
- Ask questions when you do not understand.
- Come to office hours.
- Do the homework (consider it practice on applying statistics).

Tentative Course Schedule (subject to change as necessary)

Date	**Topic**	**Reading**
8/16	No Class	
8/21	Introduction	-
8/23	Experimental Design	K1
8/28	Sources of Variability	K2
8/30	Variance Estimates and the Evaluation of the F Ratio	K3
9/4	Lab 1	G24
9/6	Analytical Comparisons Among Means	K4
9/11	Analysis of Trends	K5
9/13	Simultaneous Comparisons	K6
9/18	The Linear Model and Its Assumptions	K7
9/20	Effect Size, Power, and Sample Size	K8
9/25	Review of material	
9/27	**Test #1**	
10/2	Introduction to Factorial Designs	K10
10/4	The Overall Two-Factor Analysis	K11
10/9	Main Effects and Simple Effects	K12
10/11	The Analysis of Interaction Components	K13
10/16	No Class	
10/18	No Class	
10/23	The General Linear Model	K14
10/25	No Class – Fall Break	
10/30	The Analysis of Covariance	K15
11/1	The Single-Factor Within Subjects Design	K16
11/6	Further Within Subjects Topics	K17
11/8	Review of Material	
11/13	**Test #2**	
11/15	No Class	
11/20	No Class	
11/22	No Class – Thanksgiving Break	
11/27	The Two-Factor Within-Subject Design	K18
11/29	The Mixed Design – Overall Analysis	K19, 20
12/4	No Class – Friday Schedule	
12/6	Review of Material	
12/11	Final Exam 7pm-10pm	