



Educational Research and Measurements 8310
Applied Analysis of Variance Methods in Education
Fall Semester 2006
Instructor: Seock-Ho Kim

Syllabus

Course Description and Objective

Experimental design and the analysis of data from experiments, including orthogonal analysis of variance for single and multifactor designs, randomized block, repeated measures, and mixed models. Computer applications and the reporting results using APA style (*Graduate Bulletin* 2005-2006). Prerequisite: ERSH 6300

Textbooks

- Keppel, G., & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Huck, S. W. (2004). *Reading statistics and research* (4th ed.). Boston, MA: Allyn and Bacon.

Suggested Supplementary Texts

- American Psychological Association (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, DC: Author.
- Kirk, R. E. (1995). *Experimental design: Procedures for the behavioral sciences* (3rd ed.). Pacific Grove, CA: Brooks/Cole.
- Maxwell, S. E., & Delaney, H. D. (2000). *Designing experiments and analyzing data: A model comparison perspective*. Mahwah, NJ: Erlbaum.
- Winer, B. J., Brown, D. R., & Michels, K. M. (1991). *Statistical principles in experimental design* (3rd ed.). New York: McGraw-Hill.

Assignments, Examinations, and Evaluation

A number of exercises will be assigned and each student is expected to complete the exercises independently. All work must be completed and turned in on time. All work should be lucid, orderly, and self-contained. A set of computer exercises will also be assigned. Specific requirements for the computer exercises will be distributed later.

There will be two midterm examinations on September 26 (Tuesday, 11:00 am–12:15 pm) and on November 7 (Tuesday, 11:00 am–12:15 pm), and a final examination on December 12 (Tuesday, 12:00–3:00 pm). The final examination hours are based on the final examination schedule. The examinations will be administered in class. The examinations will be composed predominately short answer items. Copies of sample examinations will be distributed later.

Grades will be based on completion of the assigned exercises (15%), on the computer exercises (10%), and on the three examinations (25% each). Grades will be assigned as follows: A (above 95%), A⁻ (between 90% and 95%), B⁺ (between 85% and 90%), B (between 80% and 85%), B⁻ (between 75% and 80%), and C or worse (below 75%). Full attendance of lectures is required.

All academic work must meet the standards contained in “A Culture of Honesty.” Students are responsible for informing themselves about those standards before performing any academic work. The link to more detailed information about academic honesty can be found at: <http://www.uga.edu/ovpi/honesty/acadhon.htm>

Advice

On any aspect of the course, see Seock-Ho Kim, 325U Aderhold from 10:00 am to 11:00 am on Tuesday and Thursday or by appointment. For appointments or replies to brief questions, send email to shkim@uga.edu or call me at 542-4224 (office) or 310-1218 (home). If I am not available when you call 542-4224, you may also call and leave a message at 542-4110 (i.e., the main office of the Department of Educational Psychology). If you leave a message, I will probably reply by email, rather than call you back.

Class Procedures and Activities

The class will be conducted so as to maximize understanding of key statistical concepts. To facilitate this intention, most class sessions will include one or more of the following:

- Illustration of key concepts developed through assigned readings.
- Identification and discussion of these concepts in actual research settings.
- Analysis and discussion of selected problems involving these concepts.

The computer lab (618 Aderhold) has been scheduled for this class on nearly every other Thursday (11:00 am–12:15 pm). There are a total of six computer sessions, and we may meet at the computer lab.

Course Outline

August 17

Chapter 1. Experimental Design

August 22

Chapter 2. Sources of Variability and Sums of Squares

August 24

Lab 1. Lesson 24 (Green & Salkind)

August 29

Chapter 3. Variance Estimates and the Evaluation of the F Ratio

August 31

Chapter 4. Analytical Comparisons Among Means

September 5

Chapter 5. Analysis of Trend

September 7

Lab 2. Chapter 11H (Huck)

September 12

Chapter 6. Simultaneous Comparisons

September 14

Chapter 7. The Linear Model and Its Assumptions

September 19

Chapter 8. Effect Size, Power, and Sample Size

September 21

Chapter 9. Using Statistical Software

September 21

Lab 3. Chapter 12H

September 26

Midterm 1. Chapters 1–9, Lesson 24, Chapters 11H–12H

September 28

Chapter 10. Introduction to Factorial Designs

October 3

Chapter 11. The Overall Two-Factor Analysis

October 5

Lab 4. Lesson 25, Chapter 13H

October 10
Chapter 12. Main Effects and Simple Effects

October 12
Chapter 13. The Analysis of Interaction Components

October 17
Chapter 14. The General Linear Model

October 19
Lab 5. Lesson 26, Chapter 15H

October 24
Chapter 15. The Analysis of Covariance

October 31
Chapter 16. The Single-Factor Within-Subjects Design

November 2
Chapter 17. Further Within-Subject Topics

November 7
Midterm 2. Chapters 10–17, Lessons 25–26, Chapters 13H & 15H

November 9
Chapter 18. The Two-Factor Within-Subject Design

November 14
Chapter 19. The Mixed Design: Overall Analysis
Chapter 20. The Mixed Design: Analytical Analyses

November 16
Lab 6. Lesson 28, Chapter 14H

November 21
Chapter 21. The Overall Three-Factor Subjects Design
Chapter 22. The Three-Way Analytical Analysis

November 28
Chapter 23. Within-Subject and Mixed Designs
Chapter 24. Random Factors and Generalization

November 30
Lab 7. Lesson 29

December 5
Chapter 25. Nested Factors
Chapter 26. Higher-Order Designs

December 12

Final. Chapters 18–26, Lessons 28–29, Chapter 14H

Tentative Assignments

Exercises	Due Date
Set 1: Chapters 2–8 (2.1, 3.5, 4.1, 5.3, 6.1, 7.1, 8.1)	September 26
Set 2: Chapters 10–17 (10.2, 11.1, 12.3, 13.4, 14.4, 15.3, 16.3, 17.1)	November 7
Set 3: Chapters 18–26 (18.2, 19.2, 20.1, 21.3, 22.1, 23.1, 24.1, 25.3)	December 12

Note

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

August 2006

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17 Chap 1	18	19
20	21	22 Chap 2	23	24 Lab 1	25	26
27	28	29 Chap 3	30	31 Chap 4		

September 2006

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5 Chap 5	6	7 Lab 2	8	9
10	11	12 Chap 6	13	14 Chap 7	15	16
17	18	19 Chap 8 Chap 9	20	21 Lab 3	22	23
24	25	26 Mid 1 Set 1	27	28 Chap 10	29	30

October 2006

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3 Chap 11	4	5 Lab 4	6	7
8	9	10 Chap 12	11	12 Chap 13	13	14
15	16	17 Chap 14	18	19 Lab 5	20	21
22	23	24 Chap 15	25	26 Fall Break	27	28
29	30	31 Chap 16				

November 2006

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2 Chap 17	3	4
5	6	7 Mid Set 2	8	9 Chap 18	10	11
12	13	14 Chap 19 Chap 20	15	16 Lab 6	17	18
19	20	21 Chap 21 Chap 22	22	23 Holiday	24	25
26	27	28 Chap 23 Chap 24	29	30 Lab 7		

December 2006

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5 Chap 25 Chap 26	6	7	8	9
10	11	12 Final Set 3	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30