



Educational Research and Measurements 8310
Applied Analysis of Variance Methods in Education
Fall Semester 2008
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*). 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* (5th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- Huck, S. W. (2008). *Reading statistics and research* (5th ed.). Boston: Pearson 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 23 (Tuesday, 11:00 am–12:15 pm) and on November 4 (Tuesday, 11:00 am–12:15 pm), and a final examination on December 11 (Thursday, 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/honesty/>

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 706-542-4224 (office) or 706-310-1218 (home). If I am not available when you call 706-542-4224, you may also call and leave a message at 706-542-4110 (i.e., the main office of the Department of Educational Psychology & Instructional Technology). 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 seven computer sessions, and we may meet at the computer lab.

Course Outline

August 19

Chapter 1. Experimental Design

August 21

Chapter 2. Sources of Variability and Sums of Squares

August 26

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

August 28

Lab 1. Lesson 25 (Green & Salkind)

September 2

Chapter 4. Analytical Comparisons Among Means

September 4

Chapter 5. Analysis of Trend

September 9

Chapter 6. Simultaneous Comparisons

September 11

Lab 2. Chapter 11H (Huck)

September 16

Chapter 7. The Linear Model and Its Assumptions

September 18

Chapter 8. Effect Size, Power, and Sample Size

Chapter 9. Using Statistical Software

September 23

Midterm 1. Chapters 1–9, Lesson 25, Chapters 11H-12H

September 25

Lab 3. Chapter 12H

September 30

Chapter 10. Introduction to Factorial Designs

October 2

Chapter 11. The Overall Two-Factor Analysis

October 7

Chapter 12. Main Effects and Simple Effects

October 9

Lab 4. Lesson 26, Chapter 13H

October 14
Chapter 13. The Analysis of Interaction Components

October 16
Chapter 14. The General Linear Model

October 21
Chapter 15. The Analysis of Covariance

October 23
Lab 5. Lesson 27, Chapter 15H

October 28
Chapter 16. The Single-Factor Within-Subjects Design

October 30
Chapter 17. Further Within-Subject Topics

November 4
Midterm 2. Chapters 10–17, Lessons 26–27, Chapters 13H & 15H

November 6
Lab 6. Lesson 29, Chapter 14H

November 11
Chapter 18. The Two-Factor Within-Subject Design

November 13
Chapter 19. The Mixed Design: Overall Analysis
Chapter 20. The Mixed Design: Analytical Analyses

November 18
Chapter 21. The Overall Three-Factor Subjects Design
Chapter 22. The Three-Way Analytical Analysis

November 20
Lab 7. Lesson 30

December 2
Chapter 23. Within-Subject and Mixed Designs
Chapter 24. Random Factors and Generalization

December 4
Chapter 25. Nested Factors
Chapter 26. Higher-Order Designs

December 11
Final. Chapters 18–26, Lessons 29–30, 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 23

Set 2: Chapters 10–17

(10.2, 11.1, 12.3, 13.4, 14.4, 15.3, 16.3, 17.1)

November 4

Set 3: Chapters 18–26

(18.2, 19.2, 20.1, 21.3, 22.1, 23.1, 24.1, 25.3)

December 11

Note

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

August 2008

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

September 2008

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

October 2008

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

November 2008

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

December 2008

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