



Educational Research and Measurements 6300  
Applied Statistical Methods in Education  
Fall Semester 2004  
Instructor: Seock-Ho Kim

## Syllabus

### Course Description and Objective

Techniques for describing and summarizing data for educational research studies. Applications of the standard normal distribution and the use and interpretation of standard scores. Inferential statistics for one and two population studies including means, proportions, and correlations (*Graduate Bulletin* 2003-2004). Prerequisite: ERSH 4200/6200

The overall goal of the course is to present an introduction to statistics that emphasizes working with data and statistical ideas. The content of the course is divided into three parts:

1. Understanding data
2. Understanding inference
3. Application topics in inference

In order to achieve the overall goal, the course will involve readings of the textbooks, a series of assignments to reinforce the key concepts, a set of computer exercises, and three examinations.

### Textbooks

Moore, D. S. (2003). *The basic practice of statistics* (3rd ed.). New York: W. H. Freeman and Company.

Green, S. B., & Salkind, N. J. (2003). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Huck, S. W. (2003). *Reading statistics and research* (4th ed.). New York: Longman.

### Suggested Supplementary Texts

American Psychological Association (1994). *Publication manual of the American Psychological Association* (4th ed.). Washington, DC: Author.

Hays, W. L. (1994). *Statistics* (5th ed.). Fort Worth, TX: Harcourt Brace College Publishers.

Marascuilo, L. A., & Serlin, R. C. (1988). *Statistical methods for the social and behavioral sciences*. New York: W. H. Freeman and Company.

Moore, D. S., & McCabe, G. P. (2003). *Introduction to the practice of statistics* (4th ed.). New York: W. H. Freeman and Company.

Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioral research: Methods and data analysis* (2nd ed.). New York: McGraw-Hill.

A copy of 'Solutions to Exercises' from *Instructor's Guide* will be distributed in class.

## **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 28 (Tuesday, 5:00–6:15 pm) and on November 9 (Tuesday, 5:00–6:15 pm), and a final examination on December 14 (Tuesday, 7:00–10:00 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 90%), B (between 80% and 90%), C or worse (below 80%). Full attendance of lectures is required.

## **Advice**

On any aspect of the course, see Seock-Ho Kim, 325U Aderhold from 4:00 pm to 5:00 pm on Tuesday and Thursday or by appointment. For appointments or replies to brief questions, send email to [skim@coe.uga.edu](mailto:skim@coe.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 every other Thursday (5:00–6:15 pm). There are a total of seven computer sessions, and we will meet at the computer lab.

## Course Outline

August 19

Chapter 1. Picturing Distributions with Graphs

August 24

Chapter 2. Describing Distributions with Numbers

August 26

Computer Lab 1. Units 1–2, Chapter 1H (Huck)

August 31

Chapter 3. Normal Distributions

September 2

Chapter 4. Scatterplots and Correlation

September 7

Chapter 5. Regression

September 9

Computer Lab 2. Unit 5, Chapter 2H

September 14

Chapter 6. Two-Way Tables

September 16

Chapter 7. Producing Data: Sampling

September 21

Chapter 8. Producing Data: Experiments

September 23

Computer Lab 3. Unit 8, Chapter 3H

September 28

**Midterm 1:** Chapters 1–8

September 30

Chapter 9. Introducing Probability

October 5

Chapter 10. Sampling Distributions

October 7

Computer Lab 4. Unit 3, Chapter 5H

October 12  
Chapter 11. Probability in Detail

October 14  
Chapter 12. Binomial Distributions

October 19  
Chapter 13. Confidence Intervals: The Basic

October 21  
Computer Lab 5. Unit 4, Chapter 6H

October 26  
Chapter 14. Test of Significance: The Basic

November 2  
Chapter 15. Inference in Practice

November 4  
Computer Lab 6. Unit 6, Chapters 7H–8H

November 9  
**Midterm 2** : Chapters 9–15

November 11  
Chapter 16. Inference About One Mean

November 16  
Chapter 17. Comparing Two Means

November 18  
Computer Lab 7. Units 7 & 10, Chapter 10H  
(also portions of Chapters 11H, 12H, & 19H—optional)

November 23  
Chapter 18. Inference About One Proportion  
Chapter 19. Comparing Two Proportions

November 30  
Chapter 20. Two Categorical Variables: Chi-Square

December 2  
Computer Lab 8. APA  
Chapter 21. Two Quantitative Variables: Regression

December 7  
Chapter 22. Categorical Explanatory, Quantitative Response: ANOVA

December 9  
Chapter 23. Nonparametric Tests

December 14

**Final:** Chapters 16–22

## Tentative Assignments

### Exercises

### Due Date

**Set 1:** 1.26, 2.25, 3.25, 4.13, 5.18, 6.16, 7.2, 8.15

September 28

**Set 2:** 9.22, 10.9, 11.28, 12.22, 13.18, 14.26, 15.10

November 9

**Set 3:** 16.11, 17.42, 18.9, 19.20, 20.13, 21.6, 22.11

December 16

## August 2004

| 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<br>Chap 1 | 20  | 21  |
| 22  | 23  | 24<br>Chap 2 | 25  | 26<br>Lab 1  | 27  | 28  |
| 29  | 30  | 31<br>Chap 3 |     |              |     |     |

## September 2004

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

## October 2004

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

## November 2004

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

## December 2004

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