

University of Texas at Austin

Department of Educational Psychology

EDP 482K—Experimental Design and Statistical Inference

EDP 482K—Experimental Design and Statistical Inference Spring 2014	
<i>Instructor:</i> Keenan Pituch, Ph.D.	<i>Meeting Times:</i> TTH: 12:30 – 2:00; T: 2:00 – 3:00
<i>Office:</i> SZB 538C	<i>Meeting Rooms:</i> SZB 268
<i>Phone:</i> (512) 471-0672	<i>Office Hours:</i> T, TH: 9:30 – 11:00; other times by appointment
	<i>E-Mail:</i> kpituch@austin.utexas.edu

I. Course Description

The goals of this course are to provide students with an understanding of the principles underlying commonly used experimental design and analysis approaches. Specifically, students will learn to select an appropriate experimental design given a research question of interest, develop a working knowledge of how to analyze data arising from commonly used experimental designs, and be able to properly interpret and communicate analysis results. During lectures, emphasis will be placed on developing a conceptual understanding of experimental design and analysis models, as well as illustrating established data analysis practices and interpretation of analyses. During lab, attention will be given to the use of statistical software.

II. Textbook

The textbook adopted for this course is:

Stevens, J. (2007). *Intermediate Statistics: A Modern Approach* (3rd ed.). New York: Lawrence Erlbaum Associates.

There is also a Course Notes Packet for EDP 482K.

III. Topics

The major topics to be considered in this course are:

1. One-Way Analysis of Variance (ANOVA)
2. Power and Sample Size Determination
3. Two-Way ANOVA
4. Three-Way ANOVA
5. Repeated Measures Designs
6. One-way ANCOVA/ATI

IV. Requirements

1. Test 1
2. Test 2
3. Test 3
4. Test 4

The tests will cover instructional objectives as provided in class. The format of the test questions will be short answer and essay. **There is no extra credit.**

V. Grading Scale

The grade you receive for this course will be based on the percent of points you obtain on the four tests, with each assessment comprising 25% of the course grade. The average score (percent correct) on these assessments will be used to determine your course grade based on the ranges below.

A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	66-69%
F	< 66%

VI. Bibliography

The knowledge bases that support course content and procedures include:

Aiken, L., & West, S. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage Publications.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Glass, G., & Hopkins, K. (1996). *Statistical Methods in Education and Psychology* (3rd ed.). Boston, MA: Allyn and Bacon.

Howell, D. C. (2002). *Statistical Methods for Psychology* (5th ed.). Pacific Grove, CA: Duxbury Press.

Huitema, B. E. (1980). *The Analysis of Covariance and Alternatives*. New York: John Wiley.

Jaegar, R. (1993). *Statistics: A Spectator Sport* (2nd ed.). Newbury Park, CA: Sage.

Keppel, G., & Wickens, T. D. (2004). *Design and Analysis: A Researcher's Handbook* (4th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Kirk R.E. (1995). *Experimental Design: Procedures for the Behavioral Sciences* (3rd ed.). Pacific Grove, CA: Brooks/Cole.

Maxwell, S.E. & Delaney, H.D. (2004). *Designing Experiments and Analyzing Data: A Model Comparison Perspective* (2nd ed.) Mahwah, NJ: Lawrence Erlbaum Associates.

Pedhazur, E., & Schmelkin, L. (1991). *Measurement, Design, and Analysis: An Integrated Approach*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Raudenbush, S. W. (1994). Hierarchical Linear Models and Experimental Design. In L. Edwards (Ed.), *Applied Analysis of Variance in Behavioral Science* (pp. 459-496). New York: Marcel Dekker.

Stevens, J. (2007). *Intermediate Statistics: A Modern Approach* (3rd ed.). New York: Lawrence Erlbaum Associates.

Toothaker, L. E. (1991). *Multiple Comparisons for Researchers*. Newbury Park, CA: Sage.

Tate, R. L. (1998). *An Introduction to Modeling Outcomes in the Behavioral and Social Sciences* (2nd ed.). Edina, MN: Burgess International Group, Inc.

VII. Course Schedule and Policies

A. Tentative Course Schedule

Date	Unit	Readings
January 14, 16	Introduction/One-Way ANOVA	Ch. 2
January 21, 23	One-Way ANOVA	
January 28, 30	""	
February 4, 6	Power, Test 1 (6th)	Ch. 3
February 11, 13	Factorial ANOVA	Ch. 4
February 18, 20	""	
February 25, 27	""	
March 4, 6	Review for Test 2, Test 2 (6th)	
March 11, 13	<i>Spring Break</i>	
March 18, 20	Repeated Measures Designs	Ch. 5
March 25, 27	""	
April 1, 3	ANCOVA	Ch. 7
April 8, 10	ANCOVA/ATI	
April 15, 17	ATI, Test 3 (17th)	
April 22, 24	Review for Test 4	In-class materials
April 29, May 1	Review, Test 4 (1st)	

B. Policies

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY. If they certify your needs, I will work with you to make appropriate arrangements.

A student who misses an examination, work assignment, or other project due to the observance of a religious holy day will be given an opportunity to complete the work missed within a reasonable time after the absence, provided that he or she has properly notified the instructor. It is the policy of the University of Texas at Austin that the student must notify the instructor at least fourteen days prior to the classes scheduled on dates he or she will be absent to observe a religious holy day. For religious holy days that fall within the first two weeks of the semester, the notice should be given on the first day of the semester. The student will not be penalized for these excused absences, but the instructor may

appropriately respond if the student fails to complete satisfactorily the missed assignment or examination within a reasonable time after the excused absence.