EDP 482K – Experimental Design and Statistical Inference
Summer 2013 (First Term)   Lecture: Tuesday-Thursday 12:30-3:30   SZB 524

Instructor
Dr. Tiffany Whittaker
Mail: SZB 504
Phone: 512-471-2749
Email: t.whittaker@austin.utexas.edu

Office Hours
Tuesday – Thursday: 10:30-11:30am
& by appointment
Office: SZB 538H

Teaching Assistant
Daniel Swan
Email: dms031000@gmail.com

Lab Sesssion
W & TH: 3:30-4:30pm
SZB 524

Office Hours
M & T: 3:30-5:00pm
SZB 538N

Course Overview
- This course focuses on analysis of variance (ANOVA) and includes the following topics: simple analysis of variance with follow-up comparisons, factorial designs and follow-up comparisons, repeated measures design, and analysis of covariance.
- 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.
- The prerequisite for the course is EDP 371 or equivalent.

Required Course Material
- Assigned Chapters from: Stevens, J. (2007). *Intermediate Statistics: A Modern Approach* (3rd ed.). New York, NY: Lawrence Erlbaum Associates, Taylor & Francis Group.
- Class notes, available on our Blackboard website in the *Course Documents* section. Class notes will be posted prior to the day on which the notes are discussed in class and may be retrieved on Blackboard: http://courses.utexas.edu.
- Selected Articles posted on our Blackboard course website in the *Course Documents* section. See the Selected Articles Reference List on Page 3 of the syllabus.

Course Assessment
1. Exams: There will be 3 in-class exams administered. Each exam will cover material from the lessons since the last exam (unless otherwise specified). You may need a calculator for the exams for calculations. You may use one 8.5" X 11," two-sided page of notes during the exam (however, students will likely be much better prepared if they don't need to rely on it). Missed exams may not be made up unless arrangements have been made prior to class.
2. Homework: There will be four assignments, each designed to give students a chance to apply and practice the concepts learned in class and in the lab. You will have approximately 1 week to complete homework assignments 1-3. Homework 4 will be completed in-class and you may work in groups on homework assignment 4. These will typically involve using IBM SPSS to solve ANOVA problems. Assignments are due as specified in class, and should be submitted on time for full earned credit. Late work will be accepted for full earned credit IF AND ONLY IF arrangements are made with me PRIOR TO DUE DATE. Otherwise, 5% of the points possible will be deducted for each weekday the assignment is late. Please work alone on all homework assignments. For an SPSS Introduction/Orientation, go to: http://ssc.utexas.edu/software/software-tutorials#SPSS

Access to IBM SPSS
- IBM SPSS is available in the following campus labs: MEZ 2.104 (5 copies).
- You may purchase the IBM SPSS Grad Pack for $99.99 at the UT Campus Computer Store (1 Year License). Visit the following: http://www.campuscomputer.com/
- You may purchase a 6-month or 1-year student license of IBM SPSS for $59.99 or $99.99, respectively, at e-academy lease licenses. Visit the following: http://www.onthehub.com/spss/
- IBM SPSS is available on MacBook Laptops which may be checked out in the LTC and used in the LTC area (SZB 536) when not in use by other classes (which is most likely to be the mornings prior to class). There are also 4 iMacs with IBM SPSS installed in the SZB 536 area.

Course Grades
Your homework and exams will be averaged according to the percentages (weights) shown. Grades will be posted to our Blackboard website (in the *My Grades* section) – please periodically check for any keypunch errors. Final grades will then be assigned based on the scale below:

Assessment	Weight
Total homework points converted to a percentage	40%
Total exam points converted to a percentage	60%

Overall Course Percent	Grade
93% - 100%	A
90% - 92%	A-
87% - 89%	B+
83% - 86%	B
80% - 82%	B-
77% - 79%	C+
73% - 76%	C
70% - 72%	C-
below 70%	F

Unless a computational error has been made, grades will not be changed after the end of the semester.

No Extra Credit: Your course grades are based only on the above information. There will be no extra-credit opportunities.

Grades of "Incomplete:" Unless the student can demonstrate that near catastrophic events have led to a case of extreme hardship, grades of "Incomplete" will not be given.

Attendance: Attendance will not be part of your grade. Students who attend class, of course, tend to be better prepared for assignments.

Accommodations For Persons With Disabilities
Students with disabilities who require special accommodations need to get an accommodation letter that documents the disability from the Services for Students with Disabilities (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam, the student should remind the instructor of any testing accommodations that will be needed. See the following website for more information: http://ddce.utexas.edu/disability/.

Selected Articles Reference List

1. Jackson, M., & Cox, D. R. (2013). The principles of experimental design and their application in sociology. *Annual Review of Sociology, 39*, 2.1-2.23.
   - A good primer for the use of experimental designs in social and behavioral sciences.

2. Armstrong, R. A., Slade, S. V., & Eperjesi, F. (2000). An introduction to analysis of variance (ANOVA) with special reference to data from clinical experiments in optometry. *Ophthalmic and Physiological Optics, 20*(3), 235-241.
   - A user friendly and brief discussion of post hoc and planned comparisons.

3. Strayer, D. L., & Johnston, W. A. (2001). Driven to Distraction: Dual-task studies of simulated driving and conversing on a cellular telephone. *Psychological Science, 12*(6), 462-466.
   - An example of a one-way ANOVA.

4. Lee, R. M., & Robbins, S. B. (1998). The relationship between social connectedness and anxiety, self-esteem, and social identity. *Journal of Counseling Psychology, 45*(3), 338-345.
   - Study 2 is an example of a two-way ANOVA.

5. McJunkin, L. M. (2009). Effects of stereotype threat on undergraduate women's math performance: Participant pool vs. classroom situations. *Emporia State Research Studies, 45*(2), 27-31.
   - An example of a three-way ANOVA.

6. Adams. S. L., Roxe, D. M., Weiss, J., Zhang, F., & Rosenthal, J. E. (1998). Ambulatory blood pressure and Holter monitoring of emergency physicians before, during, and after a night shift. *Academic Emergency Medicine, 5*(9), 871-877.
   - An example of a one-way repeated measures ANOVA.

7. Barr, R. S., Culhane, M. A., Jubelt, L. E., Mufti, R. S., Dyer, M. A., Weiss, A. P., Deckersbach, T., Kelly, J. F., Freudenreich, O., Goff, D. C., & Evins. A. E. (2008). *Neuropsychopharmacology, 33*, 480-490.
   - An example of a three-way ANOVA

8. Aronson, J., & Inzlicht, M. (2004). The ups and downs of attributional ambiguity: Stereotype vulnerability and the academic self-knowledge of African American college students. *Psychological Science, 15*(12), 829-836.
   - An example of a one-way ANCOVA with a two-way ANOVA bonus!

9. Ben-Zeev, T. Fein, S., & Inzlicht, M. (2005). Arousal and stereotype threat. *Journal of Experimental Social Psychology, 41*, 174-181.
   - An example of a two-way ANCOVA with three-way ANOVA bonus!

Calendar

Following are the topics to be covered and the readings that students are expected to be doing, whether or not the material is explicitly addressed in class. Students should keep up with the readings. Topics and assignment due dates are subject to change, if we don't move as quickly as anticipated.

DATE	LAB	LECTURE TOPIC	READINGS
6/6	Introduction to SPSS (*Optional*)	Course Introduction Statistics Refresher Experimental Design Issues	• Chapter 1 • Article #1
6/11	--	One-Way Analysis of Variance (ANOVA) Assumptions	• Chapter 2
6/12	One-Way ANOVA	Follow up Comparisons Planned Comparisons	• Article #2
6/13	Comparisons	Power Experimental Design Issues Revisited Exam 1 Review	• Chapter 3 • Article #3
6/18	--	*Exam 1* Introduction to Factorial ANOVA	• Chapter 4
6/19	Factorial ANOVA	Two-Way Factorial ANOVA	• Article #4
6/20	Factorial ANOVA	Higher Order Factorial ANOVA Exam 2 Review *Homework Assignment 1 Due*	• Article #5
6/25	--	Introduction to Repeated Measures ANOVA Assumptions	• Chapter 5 • Article #6
6/26	Repeated Measures ANOVA	Higher Order Repeated Measures ANOVA	•
6/27	Repeated Measures ANOVA	*Exam 2* More Repeated Measures ANOVA Designs *Homework Assignment 2 Due*	• Article #7
7/2	--	Introduction to Analysis of Covariance (ANCOVA)	• Chapter 6 • Article #8
7/3	ANCOVA	ANCOVA Assumptions	• Chapter 7
7/9	--	ANCOVA with Multiple Covariates Exam 3 Review *Homework Assignment 3 Due*	• Article #9
7/10	--	*Homework Assignment 4 Due – In Class*	
7/11	--	*Exam 3*	

Other Suggested References

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

Edwards, A. L. (1985). *Experimental Design in Psychological Research* (5th ed.). New York, NY: Harper & Row.

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

Howell, D. (1997). *Statistical Methods for Psychology* (4th ed.). Belmont, CA: Duxbury Press.

Huck, S. W., & Cormier, W. H. (1996). *Reading Statistics and Research* (2nd ed.). New York, NY: Harper & Row.

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. (1991). *Design and Analysis: A Researcher's Handbook* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

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

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

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