

PSYC 307 -- Data Analysis and Applied Statistics in the Behavioral Sciences Spring 2013

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Class Meets in Midway Campus, Room 104 (Do not use "WWW")

Teaching Intern (by appointment): Nancy Walter (walterna@metrostate.edu)

Competence Statement:

Understand, conduct, and apply data analysis techniques to solve conceptual and theoretical problems in the behavioral sciences. Be able to use a statistical software package to conduct univariate and multivariate analyses, and to write explanations arguing how statistical results support or fail to support theoretical ideas.

Prerequisites:

Psyc 100, or another introductory course in the behavioral sciences. Also, students must complete their mathematics general education requirement **BEFORE** taking this course. Student must also get access to University computer labs via a Net Direct account. Also, it is recommended that you use your University e-mail account or have mail forwarded to an account that you do use regularly.

Learning Outcomes:

- (1) Students should recognize the current and historical importance of research and statistical analysis to behavioral scientists.
- (2) Students should be able to recognize and conduct a variety of univariate and multivariate inferential statistical applications commonly used by behavioral scientists.
- (3) Students should have the ability to choose the correct data analysis procedure or statistical test to answer particular behavioral science research questions.
- (4) Students should be able to use computer software (SPSS) necessary to carry out the appropriate statistical procedure to answer a given behavioral science research question.
- (5) Students should understand and interpret the results of statistical tests and be able to use the results of such tests to answer research questions, thereby increasing one's understanding of the behavioral sciences.
- (6) Students should be able to express, in writing, what a statistical result means to a person interested in the given research topic. Such written statements should make firm logical arguments for why a given result does or does not support theoretical concepts.
- (7) Students should be able to interpret and understand statistics as they are presented in professional journals within the behavioral sciences.

Textbooks and Resources:

Jaccard, J. & Becker, M. A. (2010) Statistics for the Behavioral Sciences, (5th Ed.). Belmont, CA: Wadsworth.

Kirkpatrick, L. A. [& Feeney, B. C.] (2007/2008/2011/2013). A Simple Guide to SPSS for Windows. Belmont, CA: Wadsworth. (may be pre-packaged with the course text).

Various Handouts, a basic calculator (with square root key), pencil, and paper

Optional: SPSS software (may be pre-packaged with the course texts).

Class Format

Most of the material in the textbook will be covered, though certain sections will be skipped. The logic, theory, and usefulness of each statistical procedure is presented in lecture format, including an explanation of when the procedure should be used, examples of when the procedure is appropriate, illustrations of computations/computer applications used in the procedure, and a demonstration of how the statistical result and theoretical conclusion should be expressed in writing.

Lecture outlines will be available in advance (at least 24 hours prior to class) on the class web site (<http://psyc307.stasson.org>). It is recommended that students access the lecture outline and review it before class. You may even want to print the outline and bring it to class.

Lectures are supplemented by applications designed to provide examples of the types of research problems for which each statistical procedure could be used. This will be done in both large and small group contexts. You will also learn how to do the statistical analyses on a computer using a statistical package called SPSS. We will discuss how to interpret SPSS output and present the results of statistical analyses in written form using APA format. Other computer applications that facilitate the learning of difficult concepts will be available for use in lab (and elsewhere) via the course homepage on the Internet. Thus, the course emphasizes **both** the logic/theory of data analysis and the application of statistics through the use of SPSS.

Student Progress and Evaluation of Performance:

The material in this course is acquired gradually because new material builds on previously learned concepts. It is very difficult to "cram" for a test. Thus, it is important to read your textbook assignments **BEFORE CLASS** and complete your work on time. You should also try to keep your notes and assignments clear, organized, and legible because these resources may be valuable on exams and assignments (a 3-ring binder might be helpful). Since many researchers depend on textbooks and statistical tables when they need to analyze research findings, you may use the textbook and other materials when working on the exams. **THIS DOES NOT MEAN THE EXAMS ARE EASY, THEY ARE VERY CHALLENGING!** In fact, you should try to rely on minimal resources when taking exams, otherwise you will spend too much time looking for information in the text and not finish the in-class portions of the exams.

In order to achieve the course outcomes and keep you aware of your progress, you will have regular homework and in-class assignments. These assignments help you keep up with the material. Also, because new material builds on older material all exams and homeworks are "naturally cumulative" (though each focuses on the most recent material covered).

Two EXAMS will be given. Part of the exam will be take-home, part will be scheduled in the classroom. Each EXAM will be worth 150 points (total of 300 points for 2 exams).

Homeworks, computer exercises, and in-class assignments will be worth 200 points. There will be 10-11 sets of homework distributed in class with approximately one due each week. Due dates will be specified on each assignment -- completed work is due at the START of lecture. Late assignments are penalized 10% per day. Homework will be worth a total of 150 points. In-class work will be worth a total of 50 points, you must be present to earn the points. The amount of credit varies from week-to-week, some of the in-class assignments will be completed in small groups.

A total of 500 points can be earned through the exams and exercises. Your point total is the **sole determinant** of your grade. Final grades will be according to the following scale: 460-500 (A); 450-459 (A-); 440-449 (B+); 400-439 (B); 390-399 (C+); 350-389 (C); 300-349 (D); and 0-299 (F).

Course Policies – all student policies apply – www.metrostate.edu/msweb/pathway/gateway/handbook

Attendance. Regular attendance is expected and attendance will be taken some (not every) class periods. If you miss two or more classes (lectures and/or labs) during the first three weeks you should drop or withdraw from the course. Similarly, missing five or more classes throughout the entire semester will adversely affect your grade, you are advised to withdraw if you find yourself in this situation. Furthermore, if you miss an exam, homework, or in-class assignment you may very well receive a score of 0 (zero). Exceptions or substitute assignments might be possible in some cases if you can document a valid excuse (e.g., hospital admission form, police report, etc.) for your absence and contact the instructor prior to the missed event.

Students with disabilities. Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 require Metropolitan State University to provide academic adjustments or accommodations for students with documented disabilities. Students seeking adjustments or accommodations must self-identify with Disabilities Services (Disability.Services@metrostate.edu OR 651-793-1540). After meeting with the coordinator, students are encouraged to meet with the instructors to discuss their needs, and if applicable, proposed course adjustments.

Grades of W or I. Students whose performance is below 70% (C) at the withdrawal deadline should consider withdrawing from the course with a grade of "W." **NOTE:** You must withdraw by the University deadline, University Policy permits **NO** withdrawals after the deadline. If you are in this situation the week prior to the deadline you should discuss the advantages and disadvantages of withdrawing with the course instructor. Remember, it is important to do well in your courses and to stay in good academic standing. Grades of "I," Incomplete, are reserved for students who are doing well (i.e., performance above 70%) but encounter emergency situations very close to the end of the course. Incomplete grades will not be given if the student misses more than one exam or two exercises/homework assignments. Also, students whose performance is below 70% will not be eligible for an incomplete grade.

Honor Guidelines. Each assignment turned in by a student is expected to be his or her own work. While you may discuss and ask questions about your homework assignments, and collaborate on in-class exercises, you should work independently to make sure you learn the concepts and procedures. **You are NOT permitted to collaborate on EXAMS.** You are expected to follow all academic procedures, conduct codes, and policies published in Metropolitan State University materials.

Topics Covered and Tentative Schedule

- Jan. 15 Introduction; Statistics and the Behavioral Sciences; Distributions (Chap. 1-2)
Introduction to SPSS and the Internet-Part 1
- Jan. 22 Frequency Distributions and Descriptive Statistics (Chap. 2-3)
Introduction to SPSS and the Internet-Part 2
- Jan. 29 Descriptive Statistics, the Normal Distribution, and Standard Scores (Chap. 3-4)
- Feb. 5 Sampling Distributions and the Z-Test (Chap. 7-8)
- Feb. 12 Hypothesis Testing and the one-sample t-Test (Chap. 8)
- Feb. 19 Research Design and the Independent t-Test (Chap. 9-10)
- Feb. 26 **EXAM #1** (Focus on Chapters 1-4; 7-9)
- Mar. 5 Independent t-Test; Correlated Groups t-Test (Chap. 10-11)
- Mar. 12 SPRING BREAK - No Class
- Mar. 19 One-Way ANOVA: Between-subject and Repeated Measures (Chap. 12-13)
- Mar. 26 More on One-Way ANOVA (Chap. 12-13)
- Apr. 2 Two-Way Between-Subject ANOVA (Chap. 17)
- Apr. 9 More Two-Way ANOVA; Interpreting Interactions (Chap. 17)
- Apr. 16 Correlation; Chi-Square; (Chapters 5, 14, 15)
- Apr. 23 Chi-Square; Selecting appropriate tests; Review (Chapters 15, 18)
- Apr. 30 **EXAM #2** (Focus on Chapters 5, 11-18)

All work is due April 30, the last day of class.