

COURSE TITLE/SECTION: SOWC 8425 / Statistics and Data Analysis II and Lab

TIME: Monday: Lecture (1:00-3:45p) and Lab (4:00-5:00p)

LOCATION: Lecture 110K; Lab 425

FACULTY: Danielle Parrish, Ph.D.

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LAB TA: Xin Chen

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I. Course

A. Catalog Description

Credit (4.0). Pre-requisite: SOWC 8424 or permission from instructor. Explores the application of multivariate statistics in social and behavioral sciences research via a weekly 3-hour lecture and 1-hour computer lab.

B. Purpose

The purpose of this course is to provide a conceptual and applied understanding of multivariate statistics in social and behavioral sciences research, from ANOVA to multiple regression.

II. Course Objectives

Upon completion of this course, students will be able to demonstrate the following objectives:

1. Analyze and interpret social and behavioral sciences data using multivariate statistical methods, including: ANOVA, Two-way ANOVA, Repeated measures ANOVA, ANCOVA, MANOVA, Factor Analysis, General Linear Model, Logistic Regression and Multiple Regression.
2. Present multivariate data using appropriate graphs and charts;
3. Compare and contrast different multivariate approaches to data analysis;
4. Select appropriate analytic approaches for social and behavioral sciences research data;
5. Demonstrate an understanding of the conceptual and operational connections between research study design, research questions and data analysis;
6. Apply the concepts and techniques learned in class (lab component).

III. Course Content

This course will include the following topical (content) areas:

1. A brief review of descriptive and inferential data analyses from Statistics and Data Analysis I (SOWC 8424), and the purpose of data analysis in the context of conducting social sciences research.
2. The conceptual background, assumptions, utility and limitations of the following data analysis procedures for applied and advanced research studies in the social sciences: Multiple Regression, Logistic Regression, ANOVA, Two-Way ANOVA, Repeated Measures ANOVA, ANCOVA, MANOVA, and Factor Analysis.
3. The use of SPSS to conduct the aforementioned analyses.
4. A brief conceptual introduction to Path Analysis, Structural Equation Modeling and Confirmatory Factor Analysis.
5. Guidelines for writing up the analysis and results of the aforementioned data analyses for publication and other reports.

IV. Course Structure

This course will consist of lectures (seminar/interactive style), homework, a data analysis project, exams, and a statistical lab. Students should bring a copy of their laptop with SPSS software installed to both class and lab.

LAB: Students will attend a 1-hour computer laboratory session where students will get hands-on experience utilizing SPSS software to run the analyses discussed in class.

V. Textbooks

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*, 4th ed. Thousand Oaks, CA: Sage. Student support website: <https://studysites.sagepub.com/field4e/main.htm>.

Abu-Bader, S.H. (2011). *Advanced & multivariate statistical methods for social science research: with a complete SPSS guide*.

**Additional readings will be on Blackboard.

Highly recommended and available in electronic copy at the UH library:

Keith, T.Z. (2015). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*, 2nd ed. New York: Routledge.

Highly recommended:

Pallant, J. *SPSS Survival Manual* (6th ed.), McGraw Hill.

Tabachnick, B.G., & Fidell, L.S. (2013). *Using Multivariate Statistics* (6th ed.), Pearson.

VI. Course Requirements

Homework Assignments (60%): Students will complete 3 data analysis homework assignments using SPSS to conduct an analysis, and interpret and write up the results in a table and/or brief paragraph. Each assignment will be worth 20 points for a total of 60 points. The due dates are included in the course schedule below.

Exam (30%): One exam will be given on course material at the end of the semester. This exam will test students' ability to select the correct statistical analysis given a provided research question and variables; ability to interpret and write up the results of SPSS output; and understanding of the concepts discussed in class (e.g., assumptions of multivariate analyses; differences, similarities, and limitations of analyses).

Class Attendance (10%): Class/lab attendance is essential for meeting the objectives of this course. As such, attendance comprises 10% of the grade. Students will earn one point for attending each class by being present for class on-time. An unexcused absence will result in a 2-point deduction, and being excessively late (more than 15 minutes) or having a pre-excused absence will result in a 1 point deduction.

Data Analysis Project Option: Students can individually decide if they would prefer to conduct a data analysis project in place of one homework assignment, with the possibility of earning up to 10 points additional extra credit. If students select this option, they will collect data or use select a secondary data set and use one of the multivariate data analysis procedures discussed in class to analyze the data. Students that select this option will have 2 homework assignments worth 40% and this assignment would be worth 20% with the possibility of up to 10 additional extra credit points.

Students choosing this option will:

- 1) write a detailed methodology (which should include research question(s); aims/hypotheses; sampling; variables; measurement; statistical analysis – including assumptions) and results sections in publishable journal format (Due April 24; 15 points);
- 2) write an abstract following SSWR (Society for Social Work and Research) format in preparation for the SSWR due date – submission is not required but highly encouraged to get experience with the process (Due April 24th; feedback will be provided before the SSWR deadline - usually April 30th; 10 points);
- 3) and present their project orally to the class in a 20 minute presentation (April 24; 5 points).

VII. Evaluation and Grading

The final course grades will be based on the following:

Homework Assignments (3@ 20 points each)	60%
Exam	30%
Class Attendance	10%

The following standard grading scale has been adopted for all courses taught in the college.

A = 96-100% of the points	C+ = 76-79.9%
A- = 92-95.9%	C = 72-75.9%
B+= 88-91.9%	C- = 68-71.9%
B = 84-87.9%	D = 64-67.9%
B- = 80-83.9%	F = Below 64%

VIII. Policy on grades of I (Incomplete):

The grade of "I" (Incomplete) is a conditional and temporary grade given when students are either **(a)** passing a course or **(b)** still have a reasonable chance of passing in the judgment of the instructor but, for non-academic reasons beyond their control have not completed a relatively small part of all requirements.

Students are responsible for informing the instructor immediately of the reasons for not submitting an assignment on time or not taking an examination. Students must contact the instructor of the course in which they receive an "I" grade to make arrangements to complete the course requirements. Students should be instructed not to re-register for the same course in a following semester in order to complete the incomplete requirements.

The grade of "I" must be changed by fulfillment of course requirements within one year of the date awarded or it will be changed automatically to an "F" (or to a "U" [Unsatisfactory] in S/U graded courses). The instructor may require a time period of less than one year to fulfill course requirements, and the grade may be changed by the instructor at any time to reflect work completed in the course. The grade of "I" may not be changed to a grade of **W**.

IX. Policy on academic dishonesty and plagiarism

Please click the link below for the full explanation of the Academic Honesty policy and procedure Policy: http://www.uh.edu/provost/policies/honesty_documents-honesty/academic-honesty-policy.pdf

Definitions:

“Academic dishonesty” means employing a method or technique or engaging in conduct in an academic endeavor that contravenes the standards of ethical integrity expected at the University of Houston or by a course instructor to fulfill

any and all academic requirements. Academic dishonesty includes but is not limited to, the following:

Plagiarism

- a. Representing as one's own work the work of another without acknowledging the source (plagiarism). Plagiarism includes copying verbatim text from the literature, whether printed or electronic, in all assignments including field.

Cheating and Unauthorized Group Work

- b. Openly cheating in an examination, as copying from another's paper;
- c. Being able to view during an examination, quiz or any in-class assignment an electronic device that allows communication with another person, access to unauthorized material, access to the internet, or the ability to capture an image, unless expressly permitted by the instructor;
- d. Using and/or possessing "crib notes," as unauthorized use of notes or the like to aid in answering questions during an examination;
- e. Giving or receiving unauthorized aid during an examination, such as trading examinations, whispering answers, and passing notes, and using electronic devices to transmit or receive information;
- f. Securing another to take a test in the student's place. Both the student taking the test for another and the student registered in the course are at fault;

Fabrication, Falsification, and Misrepresentation

- g. Changing answers or grades on a test that has been returned to a student in an attempt to claim instructor error;
- h. Using another's laboratory results as one's own, whether with or without the permission of the owner;
- i. Falsifying results in laboratory experiments;
- j. Misrepresenting academic records or achievements as they pertain to course prerequisites or co-requisites for the purpose of enrolling or remaining in a course for which one is not eligible;
- k. Representing oneself as a person who has earned a degree without having earned that particular degree

Stealing and Abuse of Academic Materials

- l. Stealing, as theft of tests or grade books, from faculty offices or elsewhere, or knowingly using stolen tests or materials in satisfaction of exams, papers, or other assignments; this includes the removal of items posted for use by the students;
- m. Mutilating or stealing library materials; misshelving materials with the intent to reduce accessibility to other students;

Complicity in Academic Dishonesty

- n. Failing to report to the instructor or departmental hearing officer an incident which the student believes to be a violation of the academic honesty policy;

Academic Misconduct

- o. Any other conduct which a reasonable person in the same or similar circumstances would recognize as dishonest or improper in an academic setting.

Process:

Students shall have the responsibility of reporting incidents of alleged academic dishonesty to the instructor of record involved or to the appropriate authority if the alleged act is not associated with a specific class within 5 class days of the incident. Faculty or instructor of record shall have the responsibility of reporting incidents of alleged academic dishonesty through their college hearing officer within 5 class days of the incident. The faculty should include the recommended sanction in the report. The college hearing officer will notify the student of the report and recommended sanction. The student can accept the sanction and waive a hearing or request a college hearing. A hearing shall be set within 10 days and would be consist of two faculty and three students chosen by the hearing officer.

X. Course Schedule and Reading Assignments (subject to change by instructor based on students' needs)

Week/ Date	Topic	Readings/Assignments (Class with Dr. Parrish)	Readings/Assignments (Lab with Xin)
Week 1: Jan. 23	Course Overview, Review & Introduction to Multivariate Statistics	Field Ch. 1-4	Review of concepts from Chapter 4; Discuss Data Analysis Project Possibilities
Week 2: Jan. 30	Data Cleaning & Assumptions for Multivariate Analysis	Field Ch. 5 Abu-Bader Ch. 2	Checking Assumptions in SPSS (Abu-Bader Data Set)
Week 3: Feb. 6	Correlation (Review) & Simple Linear Regression	Field Ch. 7 & 8 (pg. 293- 320) Abu-Bader Ch. 3	Simple Linear Regression in SPSS (Abu-Bader Data Set)
Week 4: Feb. 13	Multiple Regression	Field Ch. 8 (320-356) Abu-Bader Ch. 4	Multiple Regression (Abu-Bader Data Set)
Week 5: Feb. 20	Moderation, Mediation and More Regression	Field Ch. 10	Multiple Regression, Moderation & Mediation (Field Data Set)
Week 6: Feb. 27	Logistic Regression	Field Ch. 19 Abu-Bader Ch. 5	Logistic Regression in SPSS (Abu-Bader Data Sets)
Week 7: Mar. 6	Logistic Regression	Optional: Parrish, von Sternberg, Velasquez....(2012) HW #1 DUE: MR	Logistic Regression in SPSS (Abu-Bader Data Sets)
Week 8: Mar. 13	SPRING BREAK!	No readings	No readings/no lab
Week 9: Mar. 20	ANOVA & ANCOVA	Field Ch. 11 & 12 Pallant Ch. 18 Abu-Bader Ch. 7 HW #2 DUE: LR	ANCOVA (Abu-Bader Data Sets)
Week 10: Mar. 27	Factorial ANOVA & Repeated Measures	Field Ch. 13 & 14 Abu-Bader Ch. 6 Abu-Bader pg. 211-235	Factorial ANCOVA (Abu-Bader Data Sets)
Week 11: April 3	Mixed-Design ANOVA & MANOVA	Field Ch. 15 & 16 Abu-Bader pg. 236-253 Abu-Bader Ch. 9 Optional: Parrish & Rubin (2011) An Effective Model for Continuing Education Training in EBP	Mixed-Design ANOVA (Abu-Bader Data Sets)

Week 12: April 10	Factor Analysis	Field Ch. 17 Pallant Ch. 9 & 15 Optional: **Rubin & Parrish (2009) Development and Validation of the EBP Process Assessment Scale HW #3 DUE: Mixed Design ANOVA	Reliability and EFA (Data Sets from Pallant)
Week 13: April 17	Introduction to Path Analysis, CFA, and SEM (not on exam) Guest Lecture: Dr. Kirk von Sternberg, UT Austin Health Behavior Research and Training Institute	Byrne Ch. 1 Parrish & Rubin (2011) Validation of the EBP Process Assessment Scale- Short	Work on final Data Analysis Projects with Support in Lab
Week 14: April 24	Review/Reflection: *Applications of Multivariate Analysis for Research *Review of concepts	No required readings Data Analysis Project Option DUE (if selected): Abstract (for SSWR), and Journal Methods & Findings Sections	Meet to review for exam
Week 15: May 1	Exam	No required readings	No readings/No lab

XI. Additional Recommended Texts

Multivariate Statistics:

Hahs-Vaugh, D.L. (2017). Applied multivariate statistical concepts. New York, Routledge.

Pituch, K.A., & Stevens, J.P. (2016). Applied multivariate statistics for the social sciences: Analyses with SAS and IBM's SPSS, 6th ed. New York, Routledge.

Multiple Regression:

Chen, X., Ender, P., Mitchell, M. and Wells, C. (2003). *Regression with SPSS*, from <http://www.ats.ucla.edu/stat/spss/webbooks/reg/default.htm> .

Logistic Regression:

Hosmer, D.W., Lemeshow, S., & Sturdivant, R.X. (2013). Applied logistic regression, 3rd ed. Hoboken, New Jersey: John Wiley & Sons, Inc.

Structural Equation Modeling (SEM):

- Byrne, B.M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*, 2nd ed. New York: Routeledge.
- Byrne, B.M. (2012). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routeledge.
- Keith, T.Z. (2015). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*, 2nd ed. New York: Routledge.
- Loehlin, J.C. (2011). *Latent variable models: An introduction to factor, path and structural equation analysis*, 4th ed. New York: Routledge.

XII. Americans with Disabilities Statement

The University of Houston System complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for students with a disability. In accordance with Section 504 and ADA guidelines, each University within the System strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact the UH Center for Disabilities at 713-743-5400.