

Statistics for Institutional Research (HIED 6374) Course Syllabus, Fall 2017

Instructor: Dr. Anthony J. Onwuegbuzie Department of Educational Leadership & Counseling Box 2119 Huntsville, TX. 77341 Office: 936-294-4509 Cell: 813-404-6665 (10:00 am - 10:00 pm Monday to Friday) Fax: 936-294-3886 tonyonwuegbuzie@aol.com

COURSE DESCRIPTION

This course provides an overview of the most frequently used statistical methods in higher education assessment and institutional research. Emphasis will be placed on the use of data and statistical methods to inform institutional decision making. Prerequisite: HIED 6371. Credit 3.

COURSE GOALS

| IDEA Learning Objectives | Course Learning Outcomes |
|--|--|
| Objective 1: Gain Factual Knowledge (Terminology, Classifications, methods, and trends) | Describe assumptions that must be met to successfully use a variety of statistical methods in institutional research and decision making. |
| | Use statistical methods to inform institutional decision making processes. |
| Objective: 3 Learning to apply course materials (to improve thinking, problems solving, and decisions) | Accurately apply descriptive and inferential statistics. |
| | Articulate the limitations of statistical methods as they are used in institutional research analysis |
| Objective 4: Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course | Effectively report findings from institutional research data. |

COURSE FORMAT

The course will be 100% distance education and administered through Blackboard. Students can access blackboard through the Sam Houston State University Online website at http://distance.shsu.edu/blackboard/.

Content will be a combination of textbook readings, audio lectures, and group discussion. Audio lectures will be both synchronous (live) and asynchronous (pre-recorded) lectures. The goal is to provide students with flexibility in how they approach and process course material while replicating the presentation and instructor access of the traditional classroom.

Live synchronous sessions will be held every other Wednesday between 6:00PM -7:00PM central time in blackboard collaborate. It is not required that students attend these live sessions but they will be an opportunity to ask question and engage with other students in the course. Recordings of synchronous lectures will be available immediately following these sessions. The first live synchronous session will being on Wednesday, September 6, 2017.

REQUIRED TEXTS

Coughlin, M. A. (2005). *Applications of Intermediate/Advanced Statistics in Institutional Research*. Tallahassee, FL: Association for Institutional Research.

REQUIRED SOFTWARE

(SPSS Standard Grad Pack)

SPSS Inc. (2017). IBM® SPSS® Statistics Standard GradPack 24 [Computer software]. Chicago, IL: SPSS Inc.

SPSS is available on campus computers via the Software Center. SPSS is available for home-use via SamWeb>IT@Sam>Home Use Program>SPSS Statistics.

Feel free to contact the IT@Sam Service Desk for any future IT assistance.

OPTIONAL REFERENCES/RESOURCES

American Psychological Association. (2010). *Publication manual of the American Psychological Association*. (6th ed.).Washington, DC: Author.

Field, A. (2013). *Discovering statistics using SPSS* (4th ed.). Thousand Oaks, CA: Sage.

| Assignment | No. | Points | Total Points | Grade | Scale |
|--------------|-----|--------|--------------|-------|-----------|
| Discussion | 14 | 5 | 70 | A | 270-300 |
| Presentation | 1 | 50 | 50 | В | 240-269 |
| Homework | 8 | 10 | 80 | С | 210-239 |
| Exams | 3 | 33 | 100 | D | 180-209 |
| | | | 300 | F | Below 180 |

EVALUATION

Grading Scale

- A = Exceeds Standards and demonstrates learning beyond the course and stated expectations. "A" work is earned by learners who extend learning beyond the minimum presented in class and demonstrate developed reasoning, written, and verbal communication skills. A student cannot earn an A if any assignments are turned in late or are missing, even if the student earns 90% of the total points.
- B = Meets Standards and demonstrates mastery of objectives assessed. "B" work is earned by learners who demonstrate responsibility by meeting all deadlines, attending class, completing homework assignments, and earning passing grades on assessments.
- C= Inconsistent performance that may be impacted by incomplete assignments, absences, or lack of participation. "C" work is earned for submissions with several mechanical errors or issues related to quality and quantity standards.
- F= Failure to meet Standards as demonstrated by incomplete assignments, lack of participation, and failure to produce doctoral level work.

Regarding grading, work that 'meets expectation' for doctoral-level work will receive a B. Students earning A's will demonstrate work that exceeds expectations in quantity, quality, and levels of thought.

COURSE ASSIGNMENTS

***Note: All assignments are due by 11:59pm on the Sunday of the week listed in the syllabus.

Discussion

Questions about course topics will be posted each week to the course discussion board. The purpose is to give students to the opportunity to critically think about statistical concepts and institutional research in practice. In general, you will be asked to discuss new ideas or information learned during the week. Responses should be thoughtful and not simply a reply of "I agree" or "that was a good point." You will be responsible for making at <u>least two (2)</u> posts each week. Posts cannot be made on the same day and the first post must be made by Wednesday of each week.

Presentation

Each student will be responsible for taking the lead on one week's topic/discussion. You will create a brief (no more than 5 min) audio presentation that summarizes key terms/concepts, introduces the analysis, and provides links to additional online references for more detailed information. You will be expected to schedule a 30-minute meeting with me at least two (2) weeks in advance so that we can discuss the analysis prior to your presentation. This serves two purposes: 1) provides each student with oneon-one personal instruction and 2) gives you an opportunity to explore one analysis in more detail.

<u>Homework</u>

Assignments will be given throughout the semester to provide you an opportunity to practice statistical analyses and review concepts discussed in the lectures. The purpose of these assignments is to reinforce concepts learned in class. Students will generate their own unique dataset for homework in this course. Only one dataset is needed and will be used for all assignment. As such, you will need to identify a dataset that includes the following:

- ID Variable
- Three grouping variables (e.g., gender, ethnicity, degree plan, classification, etc.)
- Three continuous or interval scale variables (e.g., age, time at the university (days/mo/yrs), absences, standardized test scores, etc.)
- One continuous outcome variable (e.g., GPA)

Data can be real or simulated but the intent is to provide students an opportunity to work with data that make the most sense for their current work-related roles or research interests. Please contact me directly if you need help identifying an appropriate dataset.

Exams

There will be three (3) exams during the semester. Exams will be limited to 75 minutes and may consist of short answer, fill-in-the-blank, multiple choice, computations, and/or short essay type questions. Each question will cover material from the assigned readings and class lectures. You may access the exam any point during the week but once you begin the exam, you must complete it within the time allotted.

COURSE SCHEDULE (Tentative)

| Week 1: Aug. 23 - Sep 3 | Data Preparation |
|-------------------------|------------------|
|-------------------------|------------------|

- Measurement Scales (Coughlin p. 5-6)
- Manipulating Data into a Usable Format
- Missing Data (Cox, McIntosh, Reason, & Terenzini, 2014; Schlomer, Bauman, & Card, 2010)

| ***Live Synchronous Session | Wednesday Sent 2 (6PM - 7PM Central)*** | | |
|---|--|--|--|
| | | | |
| DUE: Academic integrity statement | | | |
| Week 2: Sept. 4 - Sept. 10 | Descriptive Statistics | | |
| Measures of Central Tendency Measures of Variability | | | |
| | | | |
| DUE: Dataset for HW Assignments | | | |
| Week 3: Sept. 11 - Sept. 17 | Descriptive Statistics | | |
| Measures of Normality (Coughlin p. 7-9 | | | |
| Measures of Relationship (Cougniin p.) | 38-45) | | |
| ***Live Synchronous Session W | ednesday Sept. 16 (6PM - 7PM Central)*** | | |
| DUE: Homework 1 | | | |
| Week 4: Sent 18 - Sent 24 | Inferential Statistics: Comparing Means | | |
| | | | |
| Sampling Distributions | | | |
| Typolitesis resulty T tests Independent Samples | | | |
| | | | |
| DUE: Homework 2 | | | |
| Week 5: Sept. 25 - Oct.1 | Inferential Statistics: Comparing Means | | |
| T-tests - Independent/Dependent Samp | bles | | |
| ***Live Synchronous Session W | ednesday Sept. 30 (6PM - 7PM Central)*** | | |
| | | | |
| DUE: Homework 3 | | | |
| Week 6: Oct. 2 - Oct.8 | Inferential Statistics: Analysis of Variance (ANOVA) | | |
| One-way designs (Coughlin p. 54-58) | | | |
| **** | ** EX AN 1**** | | |
| Week 7: Oct $9 - 0$ ct 15 | Inferential Statistics: Analysis of Variance (ANOVA) | | |
| Two- and Three-way designs (Coughling | | | |
| | Two- and Three-way designs (Cougniin p. 58-69) | | |
| ***Live Synchronous Session Wednesday Oct. 14 (6PM - 7PM Central)*** | | | |
| DUE: Homework 4 | | | |
| Week 8: Oct. 16 - Oct 22 | Inferential Statistics: Analysis of Variance (ANOVA) | | |
| Bepeated Designs Two- and Three-way | v designs (Coughlin p. 69-87) | | |
| - Repeated Designs 1 we- and Three-way designs (Cougnin p. 03-07) | | | |
| DUE: Homework 5 | | | |
| Week 9: Oct. 23 - Oct 29 | Inferential Statistics: Regression Analyses | | |
| Simple Regression (Coughlin p. 88-109) | | | |
| 1 | | | |

| ***Live Synchronous Session Wednesday Oct. 28 (6PM - 7PM Central)*** | | | |
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| DUE: Homework 6 | | | |
| Week 10: Oct. 30 - Nov. 5 | Inferential Statistics: Regression Analyses | | |
| Multiple Regression (Coughlin p. 88-109; Kra | aha et al., 2012) | | |
| *****EXAM 2***** | | | |
| Week 11: Nov. 6 - Nov. 12 | Inferential Statistics: Regression Analyses | | |
| Categorical Coding Logistic Regression (Peng, Lee, & Ingersoll, 2002) | | | |
| ***Live Synchronous Session Wednesday Nov. 11 (6PM - 7PM Central)*** | | | |
| DUE: Homework 7 | | | |
| Week 12: Nov. 13 - Nov. 19 | Inferential Statistics: Non-parametric Analyses | | |
| Tests of Location-two samples (Coughlin p. 16-26) Tests of Location-three or more samples (Coughlin p. 27-33) | | | |
| DUE: Homework 8 | | | |
| Week 13: Nov. 20 - Nov. 26 | Inferential Statistics: Non-parametric Analyses | | |
| Goodness of Fit (Coughlin p. 33-38) | | | |
| | | | |
| Week 15: Nov. 27 - Dec. 3: | Course Wrap-up | | |
| ****** EXAM 3***** | | | |
| Due by Friday Dece | mber 1 st at 11:59pm | | |

COURSE EXPECTATIONS

Academic Honesty

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. For a complete listing of the university policy, see:

Dean of Student's Office

Students are reminded that *Plagiarism* is scholarly theft, and it is defined as the unacknowledged use of others' work. More specifically, any written or oral presentation in which the writer or speaker does not distinguish clearly between original and borrowed material constitutes plagiarism. Because students, as scholars, must make frequent use of the concepts and facts developed by other scholars, plagiarism is not the mere use of another's facts and ideas. However, it is plagiarism when students present the work of other scholars as if it were their own work. Plagiarism is a serious offense. An act of plagiarism may lead to a failing grade on the paper and in the course, as well as sanctions that may be imposed by the student judicial system which can include expulsion from the university.

Assignments

Assignments are due as stated. Any project handed in after the due date will result in lowering your project grade by <u>one letter grade for every calendar day it is late</u> (including weekends). For example, if the project is handed in the day after the due date, then the project will be lowered by 10 points. If the project is handed in the next day, then it will be 20 points).

Attendance/Participation

I expect you to model the kinds of professional behavior expected in a workplace, that is, to attend any schedule course meetings/discussions. Please notify me in advance to the extent possible if you are going to miss (or be late) a class meeting. I can usually be reached, by phone or email. If you are unable to reach me, please contact the Department of Educational Leadership at (936) 294-1147.

Email Accounts

All students are expected to check and use the University-provided e-mail address as the primary mode of communication for this course. If I need to communicate with you regarding course announcements, questions, changes to the schedule, etc. I will do so through your Sam Houston State University e-mail address. If you choose to forward your SHSU e-mail to an alternate account (e.g., gmail, yahoo), then you are responsible for making sure the forwarding mechanism is working correctly.

Non-discrimination

The Texas State University System, including its Components, is an equal opportunity/-affirmative action employer and complies with all applicable federal and state laws regarding non-discrimination and affirmative action, including Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973. The Texas State University System, including its Components, is committed to a policy of non-discrimination and equal opportunity for all persons regardless of race, sex, color, religion, national origin or ancestry, age, marital status, disability, or veteran status, in employment, educational programs, and activities and admissions. Inquiries concerning discrimination should be directed to the following:

Address:

Jeanine Bias Associate Dean of Students Lowman Student Center, Suite 215 936-294-3026 jbias@shsu.edu

Student Absences on Religious Holy Days Policy:

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: "a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20...." A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see:

http://www.shsu.edu/dept/academic-affairs/documents/aps/students/861001.pdf

Students with Disabilities Policy

Any student with a disability that affects his/her academic functioning should contact the Services for Students with Disabilities (SSD) Office located in the Lee Drain Annex (next to Farrington) telephone 936-294-3512, TDD 936-294-3786 to apply for accommodations. In the event that accommodations are approved by SSD, the student is advised to schedule an appointment with the course instruction in order to present his/her accommodation form and discuss the arrangements for the accommodations.

DROP DATE

- The last day to drop Full Term courses without a "Q" and receive 100% refund is September 8, 2017.
- The last day to drop Full Term courses is November 10, 2015. Students will not be permitted to drop Full Term courses after today, and will receive the grade that is earned.

CITATIONS FOR READINGS ON BLACKBOARD

Cox, B. E., McIntosh, K., Reason, R. D., & Terenzini, P. T. (2014). Working with missing data in higher education research: A primer. *The Review of Higher Education*, *37*, 377-402. doi:10.1353/rhe.2014.0026

- Henson, R. K. (2006). Effect-size measures and meta-analytic thinking in counseling psychology research. *The Counseling Psychologist, 35*, 601-629. doi:10.1177/0011000005283558
- Kraha, A., Turner, H., Nimon, K., Zientek, L. R., & Henson, R. K. (2012). Tools to support interpreting multiple regression in the face of multicolinearity. *Frontiers in Psychology*, 3, 1-16. doi:10.3389/fpsyg.2012.00044
- Peng, C. J., Lee, K. L., & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research*, *96*, 3-14. doi:10.1080/00220670209598786
- Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology*, *57*, 1-10. doi:10.1037/a0018082
- *Online Statistics Education: A Multimedia Course of Study* (http://onlinestatbook.com/). Project Leader: David M. Lane, Rice University.
- Trochim, W. M. (2006). *The research methods knowledge base* (2nd Ed.). Retrieved from http://www.socialresearchmethods.net/kb/
- Wilkinson, L., & American Psychological Association Task Force of Statistical Inference. (1999). Statistical methods in psychology journals: Guidelines and explanation. *American Psychologist, 54*, 594-604. doi:10.1037/0003-066X.54.8.594
 [reprint available through the APA Home Page: http://www.apa.org/journals/amp/amp/548594.html].

****This syllabus is subject to change at instructor's discretion (not to conflict with University policies). Any such changes will be announced. Students are responsible for incorporating these changes.