REMS 5953: Statistical Methods in Education
COURSE SYLLABUS
FALL 2009

Course Instructor:	Chris M. Ray, Ph.D.
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Office Hours:	Monday - Friday: 8:00a – 5:00p; Appointments recommended.

Course Materials

Textbook (*Required*):

Shavelson, R. J. (1996). *Statistical Reasoning for the Behavioral Sciences* (3rd ed.). Boston: Allyn & Bacon.

Supplemental readings may also be used, and other course materials will be posted on the D2L course website (http://oc.okstate.edu/).

Additional Supplies (*Required*):

A calculator with basic mathematical functions, including the square root function, will be necessary during most class sessions. Cell phones and other electronic devices may not be used as a calculator.

Access to PASW Statistics (formerly SPSS) will be required to complete out of class assignments. PASW Statistics is available on computers in most computer labs on campus, including the Willard computer lab, and the PASW Statistics Graduate Pack is available for purchase with a Student ID at the OSU bookstore.

All students are also required to have an email account provided by the university as all electronic communication will be sent to that address.

Reference Materials (*Recommended*):

American Psychological Association. (2009). *Publication manual of the American Psychological Association* (6th ed.). Washington, D.C.: American Psychological Association.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

OSU Professional Education Council Mission and Conceptual Framework

The Professional Education Unit (PEU) prepares and develops professional educators who facilitate life long learning and enrich quality of life for people in public schools and other educational settings. OSU's Professional Education programs are based upon the L.E.A.D.S. conceptual framework: **L**eadership; **E**thics and Professionalism; **A**cademics and Professional Roles, including Content Knowledge, Integration, Human Growth and Development, Learning Environment, Technology, Teaching/Professional Practice and Assessment; **D**iversity; and **S**ervice Orientation/Community Outreach. These core values are an expansion of the earlier conceptual framework based upon Professionalism, Integration and Diversity.

OSU Catalog Description of Course

Statistical methods needed by conductors and consumers of research in education and the behavioral sciences. Introduction to interpretation and application of descriptive and inferential statistics.

Course Description

This is an introductory statistics course in the social and behavioral sciences, including education. Sampling techniques, assumptions underlying the use of statistical tests, selection of appropriate statistical techniques, calculations, and the interpretation of results of the analyses are presented.

Style of Teaching

The purpose of this course is to create an environment for students to conceptualize and utilize various statistical techniques in education and the behavioral sciences. The instructor will utilize a combination of lecture, group discussions, and in-class activities to achieve the desired learning outcomes. Computer lab sessions and handouts may be utilized to help students learn the use of statistical software. This is a master's level course of study with commensurate expectations.

Course Learning Outcomes

After completion of this course, students should be able to:

1. Define and explain basic statistical terminology and fundamental concepts of statistics.
2. Describe and identify basic non-experimental and experimental research design (e.g., within-subjects, between-subjects, correlation, factorial) and methodology (e.g., random selection, random assignment, experimenter bias, demand characteristics).
3. Compute and evaluate descriptive (e.g., mean, median, mode, variance, standard deviation) and inferential (e.g., Pearson correlation, t tests, z test, and one-way analysis of variance) statistics.
4. Construct and interpret simple and grouped frequency distributions, histograms, scatter plots, and stem-and-leaf diagrams.
5. Input data, analyze data, and interpret output for descriptive statistics, t tests, correlation, and one-way analysis of variance utilizing SPSS software.
6. Identify appropriate statistical tests to be conducted on data for specific types of research studies.
7. Write coherent summaries and interpretations of data analyzed by the above procedures.
8. Prepare written findings of data analyses.

Course Learning Opportunities

I. Attendance and Participation

Expectation: You are expected to prepare for and attend all class sessions and to participate in class discussions. Should you find an extreme circumstance that prevents you from attending class, arrangements must be made before class begins. Appropriate make-up work is mandatory or any absence will result in one half letter grade lower than the grade you would have otherwise earned.

Invitation: As you consider the wide range of possibilities for understanding and utilizing statistical methods in education, you are invited to bring in relevant topics, cognitive connections, or articles of new knowledge and understanding to present to the class members. This is not graded but is a necessity for collegiality, collaboration and other professional skills of researchers and practitioners in education.

II. Demonstration of Competencies Learned (Breadth of Learning Content)

Expectation: You are expected to complete both a mid-term exam and a final exam to demonstrate your mastery of the course objectives. The exams will primarily be comprised of multiple choice questions, though true-false, short answer, and essay questions may also be utilized as necessary to demonstrate mastery of the content. The final exam will also include a critique of a research article. Additional information concerning each exam will be provided during the class period immediately preceding the exam.

Invitation: Upon receiving your graded midterm exam, you will have one week to submit corrections. This should consist of a list of all incorrect items, the corresponding correct answer, and a brief justification of why it is the correct answer that adequately demonstrates your understanding of the material. As an incentive for demonstrating your mastery of course content in this manner, you will receive half-credit for any test items that you originally missed that have been successfully corrected.

III. Integrative and Creative Thought (Depth of Learning Content)

Expectation: You are expected to complete six (6) projects. The projects will be graded by the instructor and will comprise 60% of your course grade. Criteria for evaluation of the projects will be discussed in class and posted on the course D2L website. The project topics will be as follows:

1 Central tendency & variability
2 Correlation and regression
3 Case I t-test
4 Decision, Error, and Power
5 Independent & Dependent t-test
6 ANOVA

Invitation: You are strongly encouraged to locate and utilize data sets that are both personally and professionally meaningful in order to conduct additional analyses related to the content being studied. Further, you are encouraged to obtain research articles in your own field that utilize these techniques to obtain relevant practical examples. Should you wish to locate additional data sets for use in such a manner, the instructor will provide additional guidance and suggestions upon request.

Grading and Other Important Details

- The contribution of each requirement to the grade is as follows:

SPSS/PASW Projects (6 @ 50 pts.)	300	Due as Assigned
Midterm Exam	100	October 13
Final Exam	100	December 8th

- Course grades will be calculated as follows:

A: 90% or above
B: 80% - 89%
C: 70% - 79%
D: 60% - 69%
F: 59% or below.

- Use a realistic estimate when predicting the time you will need to complete the course activities and requirements. Although the option of taking an incomplete ("I") is available to you at the end of the semester should you encounter an emergency or other unexpected events, it will mean that you will receive one letter grade decrease in your course grade.

  If you find that you are falling behind or are experiencing difficulty in completing course assignments, please discuss the situation with the instructor as soon as possible so that mutually-negotiated accommodations can be made that will enable you to fulfill the requirements of the course and to avoid having to take an incomplete. University policy dictates that incomplete grades can only be given if 70% of the course requirements have been completed by the end of the grading period.

- Because attendance is mandatory, late or make-up work will not be accepted except in the case of rare emergencies, which the student is required to document (e.g., accident report, signed/dated doctor's note, etc.). If suitable documentation is provided, all make-up work must be completed within 3 working days of the absence. In the case of foreseen, documented absences, all assignments are expected to be submitted prior to the absence.

- It is highly unlikely that extra credit will be allowed as ample opportunities have been provided for students to demonstrate their mastery of course objectives. If an extra credit opportunity does become available, however, it will be announced to the entire class and never offered on an individual basis.

- In an effort to ensure a quality learning environment for everyone involved, it is imperative that classroom disruptions, such as unnecessary conversations, be eliminated. As ringing cell phones, text messaging, and playing games typically cause a disruption, you are expected to ensure that your cell phone is turned off before entering the classroom. If you must keep an electronic device turned on for emergency communications, please inform the instructor before the class period begins.

- Learn and practice APA (6th edition) style of writing early as all written assignments in this course must be submitted using this style. For more information regarding APA Style, including changes in the sixth edition, visit http://www.apastyle.org/.

- Students may be expected to search library databases to retrieve scholarly research articles. This information will not be covered during class meetings, though the OSU library assists students to become proficient in using academic search engines and databases.

- You are encouraged to structure professional input from others throughout the semester to promote optimal success. In other words, fully utilize your colleagues as appropriate – including fellow students and the instructor – as you work on course products.

Course Schedule

Session	Topics	Readings & Due Dates
1 – August 18	Introductions (to each other and the course)	
2 – August 25	Introduction to Statistics	Shavelson: Ch. 1, 2
3 – September 1	Frequency Distributions	Shavelson: Ch. 3
4 – September 8	Central Tendency and Variability	Shavelson: Ch. 4
5 – September 15	Normal Distribution	Shavelson: Ch. 5 **Project #1 Due**
6 – September 22	Correlation	Shavelson: Ch. 6
7 – September 29	Linear Regression	Shavelson: Ch. 7
8 – October 6	Introduction to Inferential Statistics	Shavelson: Ch. 8 **Project #2 Due**
9 – October 13	Midterm Exam	
10 – October 20	Hypothesis Testing	Shavelson: Ch. 10 (pp. 249 – 278)
11 – October 27	*t* Tests, Case I	Shavelson: Ch. 12
12 – November 3	Decisions, Error, and Power	Shavelson: Ch. 11 **Project #3 Due**
13 – November 10	*t* Tests, Case II	Shavelson: Ch. 12 **Project #4 Due**
14 – November 17	One-Way Analysis of Variance, Part I	Shavelson: Ch. 13 (pp. 370 – 389) **Project #5 Due**
15 - November 24	One-Way Analysis of Variance, Part II	Shavelson: Ch. 13 (pp. 389 – 415)
16 – December 1	Chi-Square Tests	Shavelson: Ch. 19 **Project #6 Due**
December 10	Final Exam (Thursday @ 8:00 a.m.)	

Possible Changes in the Syllabus

This syllabus is your contract for production in the course. Any changes made to it will be announced in class and posted on D2L as soon as possible. No changes increasing requirements will be made as these might adversely affect your grade.

Students Rights and Responsibilities

http://www.okstate.edu/ucs/sja/srr.html

Classroom Conduct Policy

Classroom conduct will be governed by Student Rights and Responsibilities Governing Student Behavior, Fall 2009, Section IX, Academic Policies, Rights, and Responsibilities, Subsection C, last sentence: "It is the responsibility of the student to conform to conduct conducive to learning by being prepared, prompt, attentive, and courteous in the classroom and by conforming to policies set by the teacher to maintain an academic decorum". http://www.okstate.edu/ucs/SJA/sectionIX.htm.

Academic Integrity

Consistent with Oklahoma State University policy, academic dishonesty and/or misconduct will not be tolerated. It is important that you are aware of university policy and procedures in the event that violations of academic dishonesty or misconduct do occur (please see www.okstate.edu/ucs/srr.html). Should a violation of this policy occur (and following a meeting between the instructor and the accused student), disciplinary actions consistent with university policy would be initiated. A description of behaviors that constitute academic dishonesty and/or misconduct can be found online at http://osu.okstate.edu/acadaffr/aa/ai-violations.htm

Intellectual Property Policy

Words and ideas are the intellectual property of the individuals who originated them. Thus, whenever you quote more than three words in sequence from any single source, you must enclose those words in quotation marks. Cite in parentheses the author of the book or article, the year of publication, and the number of the page on which the words were written (e.g., Solomon, 2003, p. 125). Include the complete citation of the source in your references at the end of your paper. Failure to follow these procedures will result in loss of points on any paper in which such failure occurs. Furthermore, failure to follow these procedures may be viewed as plagiarism and, thus, a violation of university policies that pertain to academic integrity. **The instructor reserves the right to report academic integrity violations and assign a grade of "F" in the course.**

Sexual Harassment

Please see the link below to review university policy and procedures regarding sexual harassment and gender discrimination.
http://home.okstate.edu/policy.nsf/0/1fed349052d11b0a862562d8007c090f?OpenDocument

Drop and Add Policy

The standard drop/add policy for fall classes will be followed as described in the Fall 2009 Syllabus Attachment.

Students with Disabilities

If any member of this class feels that he or she has a disability and needs special accommodations of any nature, the instructor will work with you and the Office of Student Disability Services (Student Union Room 326) to provide reasonable accommodations to ensure that you have a fair opportunity to perform in this class. Please advise the instructor of such disability and the desired accommodations no later than the end of the first week of classes.