The University of Akron	STATISTICS IN EDUCATION
College of Education	5100:742
Educational Foundations & Leadership	3 Credit Hours

I.   COURSE DESCRIPTION

Statistical methods and techniques used in educational measurement and in educational research are presented with an emphasis on hypothesis testing.

II.   RATIONALE

The major purpose of this course is to provide students with the concepts needed to interpret and begin to do quantitative research in their field. The course is an applied statistics course. It minimize calculation and maximizes application.

III.   COURSE GOALS/OBJECTIVES

1. To introduce the student to the concepts of collecting and analyzing data. (INTASC Principle #9)

2. To introduce the student to the use of a standardized computer programs that is generally accessible (SPSS or SAS).

3. To introduce students to the basic concepts of inferential and descriptive statistics so that they can write computer program set-ups, as well as compute t-tests, F-tests and chi-squares. (INTASC Principle #9)

4. To introduce the student to the basic organization of a research project. They will collect data, run an analysis and interpret results. That is they will produce a project applying concepts learned in goals 1-3 above. (INTASC Principle #9)

5. Sensitivity to multicultural issues is addressed by asking students to consider the implications and effects of gender, ethnic, and socioeconomic variables in both their research project and their readings. (INTASC Principle #9)

IV.   COURSE OUTLINE

Week:
1:      Overview: Structure of the course;
         Assignments and Projects; Grading
         Introduction to Statistics? Why study statistics?
         Introduction to SPSS
         How to: get up on the computer, enter data, name and save a file.

2:      The difference between: Descriptive and Inferential statistics
                                Parametric and Nonparametric Statistics
        Measures of central tendency and variability
        The Normal Curve
        Standard Scores
        Percentile Ranks
        Grade Equivalence
        Entering data. (Workbook pages 11, 12, 14, and 15).
        Run SPSS on descriptive statistics. (means, median, range,
        standard deviation.)
        Compare hand calculations to the computer printout.

3:      Correlation- Calculations of r
        When to use the different measures of relationship
        Reliability and Validity

4:      Class Problems (Workbook page 31) - cooperatively

5:      QUIZ # 1

6 & 7: Enter data (Workbook page 31)
        Run SPSS
        What does statistical significance mean?
        Type I and Type II Errors
        One Tail and Two Tailed Tests
        Degrees of Freedom
        How to use the t, F and r tables

8:      Compare the table results to the computer printout.
        The difference between:
        Random Sampling
        Random Assignment
        How to use a Table of Random Numbers.

9:      Work on project topics

10-11: Determine when to use the various tests of significance.
        (parametric and non-parametric)Introduction to Analysis of Variance (One and
        Two Way)
        Computations and computer set-up.
        Entering data, running analyses and interpretations.

12:     Control for multiple comparisons
        Identify a research question.
        Create data to test the research question.

***   NO CLASS- HAPPY THANKSGIVING

13-15: QUIZ #2
 Project: Working on data analysis
 Class discussions regarding project progress

Final Class: Presentations of projects in class.

V.   REQUIRED/OPTIONAL TEXTS

Fraas, J. & Newman, I. (1990). *Educational statistics: A workbook*. (Available at the
 Gardner Student Center, Communication Center).

Newman, I. & Newman, C. (1994). *Conceptual statistics for beginners*. Lanham, MD:
 University Press of America;.

Newman, I. & McNeil, K. (1998). *Conducting survey research in the social sciences*.
 Lanham, MD: University Press of America.

Newman, I. Benz, C Weis, D & McNeil, K. . (19 97). *Theses and dissertations: A guide
 to writing in the social and physical sciences*. Lanham, MD: University Press of
 America;.

Newman, I., Keogh, N., & Newman. C. (1986). A study guide for Techniques of
 Research, Videotapes (Available at the Communication Center).

Newman, I. (1986) *Video Tapes 1-6, Techniques in Research*.. (Available in the basement
 of Bierce Library).

Newman, I. (web site for course syllabus). Online Project Examples: Factors that
 Contribute to Non-Traditional Careers; The Incidence of Vasovagal Reactions with
 Lidocaine Usage

VI.   INSTRUCTIONAL STRATEGIES/ACTIVITIES/TECHNOLOGY

Lecture/discussion
Application of class materials
Problem solving situations
Example critiques
Example research proposals
Example Objectives
Example Tests
Video taped materials

Internet Assignments
Specific behavioral objectives given to students and tied directly course goals and test items

VII.   EVALUATION/STUDENT ASSESSMENT

20% - Printouts & Homework
30% - Quizzes
50% - Final Project

Points:

150 pts. - Quiz 1
150 pts. - Quiz 2
200 pts. - Homework and Printouts
100 pts.- Project Class Presentation
400 pts. - Final Project Write up

Overall grade for the course:

930 to 1000 = A	770 to 799 = C+
900 to 929 = A-	730 to 769 = C
870 to 899 = B+	700 to 729 = C-
830 to 869 = B	
800 to 829 = B-	

VIII.   STUDENT ETHICS AND OTHER POLICY INFORMATION

For further information about The University of Akron's policies regarding student ethics and conduct, please consult the following sources: http://www3.uakron.edu/gradsch/gradbull.html, then select "General Information" (academic honesty); or www.uakron.edu/studdev/conduct.html (Student Code of Conduct). Any student who feels she/he may need an accommodation based on the impact of a disability please consult www.uakron.edu/access and the Office of Accessibility at (330) 972-7928.

IX.   BIBLIOGRAPHY

Glass, G.V. & Hopkins, K.D. (1996). *Statistical methods in education and psychology.*
     3rd. ed. Boston, MA: Allyn and Bacon.

Hinkle, D, Wiersma, W. & Jurs, S. (1998). *Applied statistics for the behavioral sciences.*
     4th ed. Boston, MA: Houghton Mifflin.

Tukey, J.W. (1977) *Exploratory data analysis.* Boston, MA: Addison-Wesley Publishing
     Company.

Wiersma, W. (2000). *Research methods in education: An introduction.* 7th ed.
    Needham Heights, MA: Allyn and Bacon.

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