**WAYNE STATE UNIVERSITY**

**SCHOOL OF SOCIAL WORK**

**SW 9100      Social Statistics and Data Analysis      3 credits**

**Master Syllabus**

### I.      COURSE DOMAIN AND BOUNDARIES

This is a required course in the research methods sequence for WSU doctoral students. At the end of this course, students will be able to apply univariate and bivariate statistics and analysis of variance to analyze data obtained from social work practice settings. Students will learn to formulate research questions and hypotheses, choose the appropriate statistical analyses, conduct these analyses, using SPSS, interpret their findings, and communicate their results clearly and effectively to both scholarly and social work practice audiences. Perquisite: Master's-level statistics in social, behavioral or health sciences.

### II.      KNOWLEDGE AND SKILL OBJECTIVES

By the end of this course, the student should be able to identify and apply:

1.     choose and apply appropriate descriptive and bivariate statistical techniques to address research questions and hypotheses:
2.     Use SPSS for univariate and bivariate data analyses:
3.     interpret findings;
4.     communicate results clearly and effectively, using APA format;
5.     understand statistical assumptions and how to detect and address violations;
6.     recognize strengths and weaknesses in analyses and formulate constructive critiques;
7.     appreciate current controversies related to topics addressed in this course.

### III.      PERFORMANCE CRITERIA

Four papers are required. The papers are "take-home" assignments. These papers require students either to perform data analyses using SPSS, present the using APA format, interpret the results, or to critique a published research article. Secondary data sets will be provided for the assignments by the instructor. However, students may obtain permission from the instructor to analyze their own data. Papers are expected to be written independently, although students are encouraged to work together prior to writing.

Each paper counts as 25% of the final grade.  The paper topics are as follows:

Paper #1        Descriptive statistics
Paper #2        T-test and ANOVA
Paper #3        Article critique
Paper #4        Contingency table analysis ($x^2$) and correlation

Papers will be graded according to the following scale:

A.      Excellent, exceeds expectations; superior performance

B.      Good, meets all normal expectations; consistent grasp of content and competency
        in meeting course objectives

C.      Fair, meets some expectations but misses others; acceptable but barely adequate;
        uneven grasp of course content

## IV.     REQUIRED TEXTS/REQUIRED MATERIALS

Jaccard, J. & Becker, M. (2002).  *Statistics for the behavioral sciences* (4th ed.).
        Belmont, CA: Wadworth/Thompson Learning.

American Psychological Association (2001). *Publications manual of the
        American Psychological Association* (5th ed.). Washington, DC: Author.

### RECOMMENDED TEXTS

Cronk, B. (1999).  How to use SPSS: *A step-by-step guide to analysis and
        Interpretation.*  Los Angeles, CA: Pyrczak Publishing.

Morgan, S., Reichet, T., & Harrison, T. (2002).  *From numbers to words:
        Reporting statistical results for the social sciences.*  Boston, MA: Allyn
        and Bacon.

Nicol, A., & Pexman, P. (1999).  *Presenting your findings: A practical guide
        for creating tables.*  Washington, DC: American Psychological  Association.

## V.      COURSE OUTLINE

**Date**          **Topic**

**Session 1      Introduction and Overview**
                Course overview
                Key concepts and terminology
                Measurement
                Notation

**Readings:** Jaccard and Becker, Ch. 1; Wilkinson, L. and the Task Force on Statistical Inference (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist*, 54, 594-604.

**SPSS Lab 1:** Using SPSS in the Applied Research Training Facility

**Session 2** **Descriptive Statistics: Univariate Distributions**
  Frequency and probability distributions
  Data screening
  Modes of presentation
**Readings:** Jaccard and Becker, Ch. 2; Cohen, J. (1990). Things I have learned (so far). *American Psychologist*, 45, 1304-1312.

**SPSS Lab II:** FREQUENCIES, EXPLORE, DESCRIPTIVES, GRAPHS

**Session 3** **Descriptive Statistics: Central Tendency and Dispersion**
  Mean, median, mode
  Range
  Sum of squares
  Variance and standard deviation
  Skewness and kurtosis

**Reading:** Jaccard and Becker, Ch. 3

**SPSS Lab III:** Using Syntax window, SELECT CASES, transforming and creating variables (RECODE, COUNT, COMPUTE), SORT CASES

**Session 4** **Descriptive Statistics: Relative Standing**
  Percentiles
  Standard scores
  Normal distributions
**Reading:** Jaccard and Becker, Ch. 4

**Session 5** **Descriptive Statistics: Estimation and Sampling Distributions**
  Samples and populations
  Sampling distributions
  Standard errors

**Readings:** Jaccard and Becker, Ch. 7; Shlonsky, A., D'Andrade, A., & Brookhart, M.A. (2002). JSWE submission suggestions for statistical methods. *Journal of Social Work Education* 38, 5-13.

**Session 6** **Inferential Statistics: Hypothesis Testing**
  Null versus alternative hypotheses
  Type I and Type II errors
  Significance
  Effect size
  Confounding variables

**Readings:** Jaccard and Becker, Ch. 8 & 9; Prentice, D. & Miller, D. (1992). When small effects are impressive. *Psychological Bulletin,* 112, 160-164.

**Session 7**     **Inferential Statistics:t-tests**
　　　　　　　　Independent groups
　　　　　　　　One sample
　　　　　　　　Correlated groups

　　　　　　**Reading:** Jaccard and Becker, Ch. 10

　　　　　　**SPSS Lab IV**: Compare MEANS, independent samples t-test, one-sample t-test, group bar chart.

**Session 8**     **Inferential Statistics: One-way between-subjects ANOVA**
　　　　　　　　Factors
　　　　　　　　Between-subjects and within-subjects designs
　　　　　　　　Variance decomposition
　　　　　　　　F test
　　　　　　　　Multiple comparison procedures

　　　　　　**Reading:** Jaccard and Becker, Ch. 12

　　　　　　**SPSS Lab V:** ONEWAY ANOVA, General linear model (GLML Univariate, repeated measures)

**Session 9**     **Inferential Statistics:  Advanced ANOVA**
　　　　　　　　Main effects and interactions (Factorial designs)
　　　　　　　　Analysis of covariance (ANCOVA)
　　　　　　　　Multivariate analysis of variance (MANOVA)
　　　　　　　　Repeated-measures analysis of variance (RM-ANOVA)

　　　　　　**Reading:** Jaccard and Becker, Ch. 17

**Session 10**    **Critiques of Empirical Articles**

　　　　　　**Readings:** Kazdin, A. (1995).  Preparing and evaluating research reports. *Psychological Assessment*, 7, 228-237.

　　　　Black, B., Weisz, A., Coats, S., & Patterson, D. (2000).  Evaluating a psychoeducational sexual assault prevention program incorporating theatrical presentation, peer education, and social work. *Research on Social Work Practice, 10,* 589-606.

　　　　White, T., Townsend, A., & Stephens, M.A. (2000).  Comparisons of African American and White women in the parent care role. *The Gerontologist, 40,* 718-728.

**Session 11     Inferential Statistics:  Correlation**
> Linear model
> Correlation and causation
> Descriptive and inferential uses

> **Readings:**  Jaccard and Becker, Chs. 5 (pp. 125-139) & 14 (pp. 392-400)

**Session 12     Inferential Statistics: Bivariate Regression**
> Regression and prediction
> Linear versus curvilinear models
> Standardized and unstandardized coefficients

> **Readings:**  Jaccard and Becker, Chs. 5 (140-153) & 14 (401-411)

> **SPSS Lab VI:** CORRELATE, REGRESSION (linear, curve estimation)

**Session 13     Inferential Statistics:  Contingency Table Analysis**
> Chi-square
> Other measures of association

> **Readings:**  Howell, D. (1999).  Power.  *Fundamental statistics for the behavioral sciences* (4th ed., pp. 279-296).  Pacific Grove, CA; Duxbury Press; Cohen, J. (1992).  A power primer.  P*sychological Bulletin*, *112*,155-159.

## VII.    SELECTED BIBILOGRAPHY

The following sources are resources that you may find helpful as you prepare your assignments.

Chavkin, N. F. (1993).  *The use of research in social work practice.*  Westport, CT: Praeger.

Fuller, R. & Petch.  A. (1995).  *Practitioner research.*  Buckingham: Open University Press.

Gillespie, D. F. & Gilisson, C. Eds. (1992).  *Quantitative methods in social work.*  Binghamton, NY: Haworth

Grinnell, R. M. (1999).  *Social work research and evaluation*.  Itasca: F.E. Peacock.

Kimmel, A. J. (1988).  *Ethics and values in applied social research.*  Newbury Park, CA: Sage.

Schalock, R. L. (1995).  *Outcome-based evaluation.*  New York: Plenum.

Weinbach, R. W. & Grinnell, R.M. (1997).  *Statistics for social work.*   New York, NY: Longman.