STATISTICS AND RESEARCH DESIGN
COUN 512
Spring 2014
Syllabus

Course and Instructor

Instructor: Mary Campbell, EdS, School Psychologist
Office hours: by appointment
mcampbell@nsd131.org

Course Number: COUN 512

Course Title: Statistics and Research Design

Course Time: Mondays 6:00 – 8:45 p.m.

Course Location: Education Building Room 330

Semester: Spring 2014

Credits: 3 credits

Course Objectives and Accreditation

CACREP Standards Addressed in the Course

II. Professional Identity
   Assessment

G.7.
   c. Statistical concepts, including scales of measurement, measures of central
tendency, indices of variability, shapes and types of distributions, and
correlations
   d. Reliability (i.e., theory of measurement error, models of reliability, and the use
      of reliability information);
   e. Validity (i.e., evidence of validity, types of validity, and the relationship
      between reliability and validity);

G.8. Research and Program Evaluation
   a. The importance of research in advancing the counseling profession
   b. Research methods such as qualitative, quantitative, single-case designs, action
      research, and outcome-based research
   c. Statistical methods used in conducting research and program evaluation
   d. Principles, models, and applications of needs assessment, program evaluation, and
      the use of findings to effect program modifications
   e. The use of research to inform evidence-based practice
   f. Ethical and culturally relevant strategies for interpreting and reporting the results of
      research and/or program evaluation studies
Addiction Standards

Research and Evaluation

I.1 Understands how to critically evaluate research relevant to the practice of addiction counseling.

I.2 Knows models of program evaluation for addiction counseling treatment and prevention programs.

I.3 Knows …basic strategies for evaluating counseling outcomes in addiction counseling.

School Standards

Research and Evaluation

C.2 Knows how to design, implement, manage, and evaluate programs to enhance the academic, career, and personal/social development of students.

I.1 Understands how to critically evaluate research relevant to the practice of school counseling.

I.2 Knows models of program evaluation for school counseling programs.

I.3 Knows …basic strategies for evaluating counseling outcomes in school counseling (e.g. behavioral observation, program evaluation).

I.4 Knows current methods of using data to inform decision making and accountability (e.g. school improvement plan, school report card).

Course Description

The course will provide a basic understanding of research methods and program evaluation. The course covers both research design and statistical procedures. Topics covered include the program evaluation in counseling, the scientific method, experimental and correlational research, sampling methods, hypothesis development, introduction to descriptive and inferential statistics, and the choice of appropriate statistical analyses for testing specific hypotheses. Students will gain the fundamentals of statistics as they analyze counseling and educational data with emphasis on the review and interpretation of research literature (particularly in the areas of school and addiction counseling), experience the role of computers in statistical analysis, and discover the relationships among measurement, design, and statistics. At the conclusion of the course, each student will have selected a research topic and will have begun to develop a research proposal including hypotheses, sampling, and methodology. PREREQ: COUN 501 or permission of instructor.

Course Methods of Instruction

Research methodology and statistical procedures will be taught through the use of lecture and power point presentations. Class exercises, including group work, calculating statistics, and presenting research critiques, will be used to facilitate learning of methodology and statistical concepts. Demonstration of statistical analysis of data using SPSS software will be used to teach analytic procedures and students will use SPSS software to analyze data provided for practice.

Course Objectives

Students will learn the importance of research in advancing the counseling profession (II.G.8.a), a variety of research methods (II.G.8.b), statistical methods used in conducting research and program evaluation (II.G.8.c), principles, models, and applications of needs assessment, program evaluation, and the use of findings to effect program modifications (II.G.8.d), the use of research to inform evidence-based practice (II.G.8.e), and ethical and culturally relevant strategies for interpreting and reporting the results of research and/or program evaluation studies (II.G.8.f). Students will also learn
basic concepts of assessment including scales of measurement, measures of central tendency, indices of variability, shapes and types of distributions, and correlations (II.G.7.c), reliability (II.G.7.d), and validity (II.G.7.e).

Upon completion of this course, the student will:

- Understand the importance of program evaluation and the use of research to inform counseling practice
- Acquire a basic knowledge of the process or research and hypothesis testing, including limitations inherent in specific methodologies
- Be able to choose appropriate methodologies for specific research questions
- Be able to choose and evaluate instruments appropriate for measuring variables in a research project
- Acquire a basic understanding of descriptive and inferential statistics
- Be able to conduct a literature review and develop the ability to critically evaluate research literature
- Acquire a basic ability to use statistical software and interpret results from completed statistical analyses
- Be able to detect misuse of statistical reporting in professional articles
- Demonstrate understanding of SPSS
- Distinguish between good and poor research design
- Evaluate statistical reports and integrate the data with sound educational decision making

Upon completion of the course, addiction students will demonstrate knowledge in the following:

1. How to critically evaluate research relevant to the practice of addiction counseling. (AI.1).
2. Models of program evaluation for addiction counseling treatment and prevention programs. (AI.2).
3. Basic strategies for evaluating counseling outcomes in addiction counseling (AI.3)

Upon completion of the course, school students will demonstrate knowledge in the following:

1. How to design, implement, manage, and evaluate programs to enhance the academic, career, and personal/social development of students. (SC.2).
2. How to critically evaluate research relevant to the practice of school counseling. (SI.1).
3. Models of program evaluation for school counseling programs. (SI.2).
4. Basic strategies for evaluating counseling outcomes in school counseling (e.g. behavioral observation, program evaluation). (SI.3).
5. Current methods of using data to inform decision making and accountability (e.g. school improvement plan, school report card). (SI.4).

<table>
<thead>
<tr>
<th>Technology Skills Addressed in the Course</th>
<th>Instructor Application</th>
<th>Student Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilize Blackboard technology</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Word process, including APA formatting</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Use a spreadsheet and a statistical package</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Acquire graphics from the web, digital camera,</td>
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<td>X</td>
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</table>
scanner, or Microsoft media and insert them into a poster or presentation

<table>
<thead>
<tr>
<th>Task</th>
<th>CACREP</th>
<th>Key Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create and deliver a power point presentation</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Find material on the Web and review Web sites</td>
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<tr>
<td>Be able to use e-mail, including document attachments</td>
<td>X</td>
<td>X</td>
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<td>Be able to sign in and participate in listservs</td>
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<td>Be familiar with computerized testing</td>
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<td>Be able to use digital recording equipment</td>
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</table>

**Student Learning Outcomes (SLOs) for Addiction Standards**

The student will demonstrate knowledge, skills, and practices necessary for success as a counselor educator and supervisor via his or her participation in key assessments in this course. SLOs for this course are as follows:

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>CACREP</th>
<th>Key Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understands how to critically evaluate research relevant to the practice of addiction counseling.</td>
<td>AI.1</td>
<td>Journal Article Critique</td>
</tr>
<tr>
<td>Knows models of program evaluation for addiction counseling treatment and prevention programs.</td>
<td>AI.2</td>
<td>Program Evaluation Paper</td>
</tr>
<tr>
<td>Knows … basic strategies for evaluating counseling outcomes in addiction counseling.</td>
<td>AI.3</td>
<td>Program Evaluation Paper</td>
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</tbody>
</table>

**Student Learning Outcomes (SLOs) for School Standards**

The student will demonstrate knowledge, skills, and practices necessary for success as a counselor educator and supervisor via his or her participation in key assessments in this course. SLOs for this course are as follows:

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>CACREP</th>
<th>Key Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows how to design, implement, manage, and evaluate programs to enhance the academic, career, and personal/social development of students.</td>
<td>SC.2</td>
<td>Program Evaluation Paper</td>
</tr>
<tr>
<td>Understands how to critically evaluate research relevant to the practice of school counseling.</td>
<td>SI.1</td>
<td>Journal Article Critique</td>
</tr>
<tr>
<td>Knows models of program evaluation for school counseling programs.</td>
<td>SI.2</td>
<td>Program Evaluation Paper</td>
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<tr>
<td>Knows … basic strategies for evaluating counseling outcomes in school counseling (e.g. behavioral observation, program evaluation).</td>
<td>SI.3</td>
<td>Program Evaluation Paper</td>
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<tr>
<td>Knows current methods of using data to inform decision making and accountability (e.g. school improvement plan, school report card).</td>
<td>SI.4</td>
<td>Program Evaluation Paper</td>
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**Academic Requirements and Evaluation**

Key assessments and other assignments:

- **Journal Article Critique Paper (10 points) – (AI.1; SI.1)**
  
  Select a journal article that includes statistics (select an article that is related to your Program Eval Paper). Submit a copy of the article with a 2-3 page summary and critique of the article.

- **Assignment #1 (0 Points)**
  
  See handout.

- **Assignments #2-4 (5 Points Each)**
  
  SPSS problem sets to be completed in SPSS lab in groups of 3-4.

- **Exam #1 (15 Points) - (AI.2 – AI.3; SC.2; SI.2 – SI.4) and Exam #2 (15 Points)**
  
  Exam #1 will focus on knowledge of research methods and program evaluation and will be multiple-choice. Exam #2 will focus on knowledge of statistics and will be multiple-choice.
- **Program Evaluation Paper (35 points) - (AI.2 – AI.3; SC.2; SI.2 – SI.4)**

  Design a program evaluation for an addiction or school program. This should include a description of the 4 steps of evaluation, a review of literature relevant to your program, methodology, including a description of intervention/treatment components and a logic model with measurable outcomes for the program (see paper format). This is a group paper and is to be completed in groups of 3-4 students. It should be 8-10 double-spaced pages (not including references) and should be prepared using APA style.

- **Program Evaluation Presentation (10 points)**

  Your program evaluation proposal is to be presented with your group as a power-point presentation following the paper format (15 minutes).

### Total Points and Grading Scale

**Grading Criteria**

A = 100-90, B = 89-80, C = 79-70

Assignments not submitted when due or not in the assigned format will not earn full points. Those submitted more than three days past the due date will not be accepted. Plagiarism is sufficient grounds for failure for the course. See current Boise State Graduate Catalog for academic regulations and appeal procedures.

### Disability and Academic Integrity Statements

**Disability Statement:**
If there is someone in the class who has a special need that may be the result of a disability or alternative learning style, I would appreciate hearing from you. I am reasonably certain that we can make the appropriate arrangements if necessary to assist you. The accommodations can take many forms, whether it is seating, testing, or the like. Please see me after class, or during my office hours.

**Academic Integrity Statement:**
Academic misconduct or dishonesty such as cheating and plagiarism is unacceptable and appropriate penalties will be imposed. This includes referencing material that has not been read by you, such as secondary references.

### COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
<th>Key Assessment Due Date</th>
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<tbody>
<tr>
<td>1/20</td>
<td>Holiday – No Class</td>
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<tr>
<td>1/27</td>
<td>Overview and Syllabus Review</td>
<td>Ch 2 pp 38-54; Ch 13-14; APA</td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Reading Material</td>
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<tr>
<td>2/3</td>
<td>Scientific Method</td>
<td>Ch 1; Ch 2 pp 29-37; Ch 8 (II.G.8.b)</td>
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<td></td>
<td>Developing Research Questions and Hypotheses</td>
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<td>Experimental and Correlational Research Design</td>
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<td>Internal and External Validity</td>
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<td>2/10</td>
<td>Data Collection: Qualitative and Quantitative</td>
<td>Ch 3; Ch 4 (II.G.7.c, d and e; II.G.8.b; SI.3)</td>
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<td></td>
<td>Measurement: Reliability and Validity</td>
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<td>Measurement: Scales of Measurement</td>
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<td></td>
<td>Types of Dependent Variables</td>
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<tr>
<td>2/17</td>
<td>Holiday – No Class</td>
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<tr>
<td>2/24</td>
<td>Observational and Survey Research</td>
<td>Ch 4; Ch 8; Ch 10 pp 256-261; Ch 11 290-298; 12 (II.G.8.b; SI.3)</td>
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<td>Sampling Procedures</td>
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<td>Experimental Research</td>
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<td>Between and Within Subjects Designs</td>
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<td>Single Case Designs</td>
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<tr>
<td>3/3</td>
<td>Counseling Research and Evidence-Based Practice</td>
<td>COURSE READER</td>
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<td></td>
<td>Needs Assessment</td>
<td>Journal Article Critique Due</td>
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<td></td>
<td>Program Evaluation and Logic Models</td>
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<td>Action Research</td>
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<td></td>
<td>Cultural Considerations in Counseling Research</td>
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Manual; ACA Code of Ethics, Section G

COURSE READER
Elmore (2010) - All students
Lambert (2011) - Addiction students

(II.G.8.a,d,and e; Al.1-3; SC.2; SI.1-4)
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Chapter(s)</th>
<th>Exam/Assignment Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/10</td>
<td>Exam 1 Introduction to Statistics and SPSS Central Tendency and Variability (SPSS demonstration) Normal distribution and Standardization</td>
<td>Ch 5 (II.G.7.c; II.G.8.c)</td>
<td>Exam 1 Assignment #1 Due</td>
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<tr>
<td>3/17</td>
<td>SPSS Computer Lab</td>
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<td>3/24</td>
<td>Spring Break – No Class</td>
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<tr>
<td>3/31</td>
<td>Correlations Linear Regression Hypothesis Testing Type I and II Errors Significance Testing and Effect Size</td>
<td>Ch 6; Ch 7 (II.G.7.c; II.G.8.c)</td>
<td>Assignment #2 Due</td>
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<tr>
<td>4/7</td>
<td>SPSS Computer Lab</td>
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<tr>
<td>4/14</td>
<td>t-tests Analysis of Variance (Univariate and Multivariate) Non-parametric Statistics (SPSS demonstration)</td>
<td>Ch 9 pp 209-215; Ch 10 pp 261-283; Ch 11 pp 298-310 (II.G.8.c)</td>
<td>Assignment #3 Due</td>
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<tr>
<td>4/21</td>
<td>SPSS Computer Lab</td>
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<tr>
<td>4/28</td>
<td>Exam 2 Group Work – Program Evaluation Paper</td>
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<td>Exam 2 Assignment #4 Due</td>
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<tr>
<td>5/5</td>
<td>Program Evaluation Presentations</td>
<td></td>
<td>Program Evaluation Paper Due</td>
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</table>
Journal Article Critique

Read one empirical article (attach article to paper when turn in assignment) in your area of interest and write a 2-3 page paper evaluating the article. Include the following:

1. Evaluation of the Introduction: definition of the problem, literature review, rationale for conducting the study, the hypothesis, and how well hypothesis generation follows logically from the description of the problem.

2. Evaluation of Methods: adequate sample size, adequate information on procedure (could you replicate?), adequate measures (reliable and valid?)

3. Evaluation of Research Design used: is the design appropriate to research question? if variables were manipulated what were they? What is the IV? The DV?

4. Evaluation of Statistics/Results: are the statistics appropriate to the data and research question?

5. Evaluation of the Discussion: are the results reviewed and incorporated into the current body of literature? discussion of limitations, directions for future research, clinical/practical implications of research.

6. Are there any ethical issues present in this article? If so, were they addressed?
Program Evaluation Paper Format

Abstract

Planning: Define Purpose and Identify the Evaluation Question(s)

Introduction
- Description of Chosen Topic/Problem
- Literature Review (using Psych Info or other data bases) including critique of the literature
- Rational for Conducting the Evaluation (including how you are expanding current knowledge)
- Specific, Detailed Research Evaluation Question(s)

Development: Formulation of the Research Design

Methods
- Evaluation Design (pre-test/post-test; post-test only)
- Logic Model (Appendix)
- Data Collection Plan
  - Participants (age, gender, etc)
  - Procedure (informed consent, sampling, data collection methods)
  - Measures/Instrumentation (description of all variables relevant to your research question/hypothesis(es), the operationalization of your variable(s) including a description of measures including reliability and validity information)
- Intervention(s)

Implementation Plan: Data Analysis and Drawing Conclusions

Data Analysis Strategies
- Descriptive
- Inferential
- Expected Results

Feedback Plan: Discussion of Results and Dissemination of Findings

Discussion
- Summary of purpose of project and expected results
- Limitations including sampling, internal and external validity problems etc.,
- Potential counseling implications – how this research may inform counseling practice
  - School Students: this includes discussion of school improvement plan/report card as part of informing decision making and increasing accountability
- Description of how the information will be disseminated

References (minimum of 10 sources in literature review – peer reviewed journal articles preferred; DO NOT USE ONLINE SOURCES SUCH AS WIKIPEDIA)

**Although this is a group project, each student needs to work on all aspects of the paper –
e.g. the articles in the literature review read by all students; the research designed by all students; and analyses and limitations discussed by all students.