CNEP 6372
SEMINAR IN APPLICATIONS OF ADVANCED STATISTICAL TECHNIQUES AND EVALUATION METHODOLOGY
TEXAS A&M UNIVERSITY-CORPUS CHRISTI
3 semester hours
Spring Semester 2016
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Office Hours: Mondays and Tuesdays 12-3 and by appointment

I. CATALOG DESCRIPTION OF THE COURSE:
CNEP 6372. Seminar in Applications of Advanced Statistical Techniques and Evaluation Methodology. Three semester hours.
This research methodology course is designed to provide doctoral students with application experience in quantitative, qualitative, and mixed-method data analytic procedures. Students will address promises and pitfalls using advanced univariate, multivariate, and non-parametric techniques introduced in CNEP 6360 and CNEP 6370. Students will act as consultants and evaluators on projects developed by student research teams in the department. This course is designed to help students address data analytic applications relevant to professional consulting and clinical and counseling practice as well as contexts involving program evaluation in a wide range of professional settings. Prerequisites: CNEP 6320; CNEP 6360; CNEP 6370.

II. Rationale
This is an interdisciplinary research course, emphasizing designing quantitative and qualitative research, coding and analyzing data, computing statistical results, and using statistical software. Outcomes include the ability to develop hypotheses, execute statistical tests, analyze the results, and communicate the results.

III. State Adopted Proficiencies
Coursework may be applied toward LPC licensure in the State of Texas.

IV. CACREP Standards and Additional Competencies
1. Understands univariate and multivariate research designs and data analysis methods. (E1)
2. Understands qualitative designs and approaches to qualitative data analysis. (E2)
3. Demonstrate the ability to formulate research questions appropriate for professional research and publication in counseling (F1)
4. Demonstrate the ability to create research designs appropriate to quantitative and qualitative research questions (F2)
5. Demonstrates professional writing skills necessary for journal and newsletter publication (F3).
6. Understand various quantitative methods for evaluating counseling effectiveness (G2)
7. Understand the procedures for reviewing research literature
8. Understanding statistical concepts appropriate for analyzing data from different research designs

9. The student will understand and apply:
   a. design and implementation of quantitative research and methodology
   b. uses and limitations of statistical software (SPSS®).

V. Course Objectives/Learning Outcomes

Course Objectives:

Each student will develop and be able to demonstrate an understanding of the following:

1. Student will understand, apply and interpret correlational and experimental designs using multivariate procedures advanced correlational analyses nonparametric tests ...as they are appropriate to the research questions and hypotheses.

2. Student will conceptualize and analyze qualitative data.

3. Students will have the knowledge and understanding of the following:
   - models and methods of assessment and use of data
   - univariate and multivariate research designs and data analysis methods
   - formulate research questions appropriate for professional research and publication in counseling
   - create research designs appropriate for professional research and publication in counseling
   - qualitative designs and approaches to qualitative data analysis

Student Learning Outcomes

1. Students will design, identify, and evaluate research designs through examination, projects, and homework assignments focused on nonparametric statistics, univariate and multivariate parametric statistics, and covariates in univariate and multivariate parametric statistics.

2. Students will formulate research questions specific to counseling research as evidenced by performance on exams and project with a focus on nonparametric statistics, univariate and multivariate parametric statistics, and covariates in univariate and multivariate parametric statistics.

3. Students will differentiate between descriptive, experimental, and correlational designs focused on nonparametric statistics, univariate and multivariate parametric statistics, and covariates in univariate and multivariate parametric statistics and will demonstrate appropriate application through examination, homework assignments, and project.

4. Students will conduct a research project consistent with guidelines for publication relevant to the counseling profession in the project component of the class.

5. Students will apply quantitative evaluations specific to counseling effectiveness through completion of a research project and examination.

6. Students will complete a literature review on a counseling-related topic as evidenced by completion of a research project.
7. Students will identify differences in quantitative sampling procedures through examination, homework, and project with a focus on nonparametric statistics, univariate and multivariate parametric statistics, and covariates in univariate and multivariate parametric statistics and qualitative research design.

8. Students will utilize statistical concepts appropriate for descriptive, experimental, and correlational designs focused on nonparametric statistics, univariate and multivariate parametric statistics, and covariates in univariate and multivariate parametric statistics in examination, project, and homework assignments.

9. Students will evaluate various coding methods for qualitative research through assignments and research project.

VI. Course Topics

Each student will develop and be able to demonstrate an understanding of:
- Model assumptions involved in univariate and multivariate techniques
- Advanced skills in univariate statistics
- Overview of multivariate techniques
- Designing and analyzing qualitative data

VII. Instructional Methods and Activities

Lectures, Homework, SPSS Exercises, Computations, Exams, and a Research Project

VIII. Evaluation and Grade Assignment

Midterm Exam (30 points)

Research Paper (30 points)

Homework assignments (60 points)

Research Presentation (30 points)

Class Participation (10 points)

GRADING POLICIES: Finally, your grade will be assigned based on the following schemata:

A = 135-150
B = 120-134
C = 105-119
D = 90-104
F = 89 & BELOW

You are encouraged to work in groups to complete your homework. Students tend to perform better in this class when small study groups are used for homework and exam preparation. While each student is required to turn in homework, working together is permissible and encouraged. However, all other projects are to be done individually. Students who work together on other work will have committed a serious infraction and will be referred to the graduate school, consistent with university policy, if cheating is suspected.
For all homework, a point value is given for each graded section. Partial credit is possible for all computations and written responses (e.g., short essay, open-ended questions). Partial credit will be awarded when minor errors due to computation or a qualified understanding of a concept is noted. No credit is given when several minor errors or major errors/omissions are apparent.

Writing Assignments:

To get full credit on written assignments, use American Psychological Association Publication Manual (6th Ed.) guidelines. All written assignments should use 12 point font, Times New Roman, 1” margins on top and bottom; 1” to 1.25” (default on MS Word) for left and right margins.

Written assignments are weighted equally across three categories: mechanics, structure, and content. Review the rubric in the appendix of this syllabus.

Participation in Class:

To receive all of the participation points, students are expected to attend class on time, complete all assigned readings beforehand, refrain from any cell phone/superfluous technology use in class, act respectfully towards the instructor, actively participate in class activities and discussion, and respond professionally and appropriately to feedback.

IX. Course Schedule and Policies

Attendance

Much of the learning in the course occurs in the context of discussion, demonstration, and class activities. Students are expected to be on time and actively participate in class. Students with more than 5 hours of absences (for any reason) will have their final grade dropped one letter for the semester.

Late Work

All late assignments receive a letter grade deduction. No late assignment will be accepted one week after due date. Any assignments not turned in by the last day of class will not be graded.

Academic Integrity/Plagiarism


University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, forgery, or plagiarism. (Plagiarism is the presentation of the work of another as one's own work.)

Disciplinary action for academic misconduct is the responsibility of the faculty member assigned to the course. The faculty member is charged with assessing the gravity of any case of academic dishonesty, and with giving sanction to any student involved.

Penalties that may be applied by the faculty member to individual cases of academic dishonesty include one or more of the following:
I. Written reprimand;
2. Requirement to re-do work in question;
3. Requirement to submit additional work;
4. Lowering of grade on work in question;
5. Assigning grade of "F" to work in question;
6. Assigning grade of "F" for course;
7. Recommendation for more severe punishment, such as dismissal from the program or from the University.

If the faculty member determines that assigning a grade of "F" to the course is the appropriate penalty and this disciplinary action occurs prior to the deadline for dropping courses, the student forfeits his/her right to drop the course in question.

If the faculty member recommends more severe punishment, such as dismissal from the program or from the University, the faculty member will notify the appropriate chair/college dean, who in turn will notify the Office of Student Affairs. If dismissal from the University is recommended, the Office of Student Affairs will follow its procedure for such cases.

The faculty member must file a record for each case of academic dishonesty, including a description of the disciplinary action taken, along with any materials involved, with his or her college dean, who will forward a copy to the Office of Student Affairs. The office of the academic dean of the college in which the offense took place will maintain records of all cases of academic dishonesty reported for a period of five years. The Office of Student Affairs will also maintain records of such cases for a period of five years. The Office of Student Affairs will inform the Graduate Dean as appropriate.

Any student who has been penalized for academic dishonesty has the right to appeal the judgment or the penalty assessed. Students who wish to appeal an academic dishonesty decision should contact the Office of Student Affairs for guidance.

Dropping a class
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class.
**This schedule is tentative and may change at the instructor’s discretion**

<table>
<thead>
<tr>
<th>Date</th>
<th>Reading</th>
<th>Assignment/Presentation</th>
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<tbody>
<tr>
<td>1/21</td>
<td>CH. 6 &amp; 7</td>
<td>Review</td>
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</tbody>
</table>
| 1/28   | CH. 5      | Data cleaning
Assign HW 1                                      |
| 2/4    | CH. 8      | Multiple Regression                             |
| 2/11   | CH. 10     | Multiple Regression Continued/ Mediator and Moderator Variables
HW 1 due
Assign HW 2                                      |
| 2/18   | CH. 19     | Logistic Regression                             |
| 2/25   | CH. 16     | MANOVA                                          |
| 3/3    |            | MANCOVA
HW 3 due
Assign HW 4                                      |
| 3/10   |            | Review for Midterm                             |
| 3/17   | NO CLASS   | Spring Break                                    |
| 3/24   |            | MIDTERM                                         |
| 3/31   | NO CLASS   | ACA Conference                                  |
| 4/7    | O'Neill, et al. | SCRD
Assign HW 5                                      |
| 4/14   |            | Other Advanced Statistical Techniques
Presentations
HW 5 due                                      |
| 4/21   |            | Presentations                                   |
| 4/28   |            | Presentations                                   |
| 5/5    |            | Presentations
Research Paper Due                             |

**X. Textbook(s)**

**Required:**


**Recommended:**

In addition, a number of supplementary articles may be discussed during the course. These will be used to supplement the texts and to exemplify how certain examined statistical methods are used in psychological research. Each of these supplementary readings will be made available by the instructor.

SOFTWARE:

SPSS® Graduate Pack 20 or higher

Software is also loaded on several computers on campus and Metroplex.

There is a Student Pack that is also sold. Do not purchase this as it will not run all of the analyses we will be doing in this class.

XI. References/Resources


INTERNET RESOURCES:


http://www.anselm.edu/homepage/jpitoch/biostatstime.html -- History timeline for statistics

http://www.psychstat.smu.edu/introbook/sbk00.htm A very good on-line text for introductory statistics.

http://research.ed.asu.edu/siip/ -- Many resources for statistics, including databases.


http://www.statistics.com/ -- Information about statistics software (major packages like SAS, SPSS and S-PLUS, shareware and smaller packages too), as well as about statistics analysis, data analysis and short courses in statistics.

http://www.dartmouth.edu/~chance/ -- The Chance Database; includes videos and audio on topics related to chance, statistics, probability, randomness, etc. An excellent site.

http://nilesonline.com/data/ -- Where to find data on the Internet; many sources, from agriculture to education to economics and more.

to provide easy access to the full range of statistics and information produced by these agencies for public use.

http://lib.stat.cmu.edu/

http://lib.stat.cmu.edu/datasets/

http://lib.stat.cmu.edu/DASL/DataArchive.html

XII. Grade Appeals

As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

XIII. Disabilities Accommodations

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101. If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-581
Research Paper

Identify a topic of research and describe the methodology you would use. Your answer should be a minimum of 14 pages, and not exceed 25 pages, excluding bibliography, and must be written in APA style. Use the following outline for your answer:

**QUANTITATIVE**
1. **Justification of study (2-3 pages)** – Provide a brief discussion of relevant literature that states the problem, the importance of the problem, and your approach to the problem.
2. **Research Design and Procedure (5-10 pages)** – Include in this section the following:
   a) Overview: A general description of the type of research to be conducted (e.g., experimental, correlational, explanatory non-experimental) Identify the design using sources such as Campbell and Stanley (1963);
   b) Validity (1 page): Threats to internal and external validity;
   c) Participants: The population studied, sampling method, and presumed description of the study participants;
   d) Variables: Operationalize the independent (or explanatory) and dependent (or criterion) variables including their measurement and scaling (e.g., sex is categorical and nominal with two levels, male and female); and
   e) Procedure: Describe the actual steps you will undertake to obtain your data. Identify pros and cons of your methods.
3. **Recommended Data Analysis (5-10 pages)** – Based upon the anticipated research design, identify the method of data analysis you would use and provide specific steps in the process (e.g., if regression, how will the variables be entered and why). Be sure to justify why you chose this method, and highlight its pros and cons. Be as specific as possible, although you do not need to provide numerical examples. Include: Model assumptions, control for error, test results, and effect size
4. **Results and Discussion (2-3 pages)** – Discuss your expected findings and their potential ramifications, based upon the literature review completed above. Identify potential limitations of your study and how these might be addressed by future researchers.

**QUALITATIVE**
1. **Justification of study (2-3 pages)** – Provide a brief discussion of relevant literature that states the problem, the importance of the problem, and your approach to the problem.
   a) Why should it be done? Who will benefit and how many will benefit? How will the field or subject benefit from your research? Frame it as a larger theoretical policy problem and thereby develop its significance
Pose initial research question and sub-questions:

a) Theoretical Sensitivity, personal experience, professional experience, personal knowledge of the literature analytic rigor

b) Discuss the parameters of the study.

2. Research Design and procedure (5-10 pages)

a) Statement of the Problem or Focus of the Study.
b) Research Question and sub-questions- Depth vs Breadth
c) Site and Sample Selection
d) Describe the overall research strategy and give a rationale for it. This is an overview. Extended discussion of research tactics should be covered under the appropriate headings (observations, interview, document collection). Create a conceptual diagram- In what sequence will you execute your study and why?
e) Researcher’s role management
f) Theoretical position as it influences your research design, appropriateness of the methodology for answering your research question includes adequate description of your particular theoretical approach
g) Data Collection: How will you collect data that will answer your question? What will be the relationship between various data collection types?
h) How will you ensure trustworthiness? prolonged engagement, persistent engagement, triangulation, peer debriefing, member checks, audit trail
i) How will you deal with potential evidentiary inadequacies of research design?
j) How will you managing and record data?

3. Recommended Data Analysis (5-10 pages)

a) How will you analyze the data? State specifically how you will proceed to analyze each type of data (observation, interview, documents) during each stage of analysis. For example, open coding, axial coding, selective coding
b) Grounding the theory- How did you validate your theory against the data? Explain domain and dimensional analysis if you intend to use them.
c) Management plan, time line, and feasibility analysis.

4. Results and Discussion (2-3 pages) – Discuss your expected findings and their potential ramifications, based upon the literature review completed above. Identify potential limitations of your study and how these might be addressed by future researchers

Note: Qualitative research terms are not common knowledge and do differ in meaning depending upon which author you are citing; therefore, it is not sufficient to merely refer to a term. Always explain exactly what you mean by each qualitative term the first time you use it in a qualitative research proposal. In addition, you should state how that term is relevant to your study.
<table>
<thead>
<tr>
<th>Research Paper (30 points)</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Justification of Study</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Research Design &amp; Procedure</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
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<tr>
<td>Recommended Data Analysis</td>
<td>10</td>
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<td>7</td>
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<tr>
<td>Results &amp; Discussion</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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Research Presentation

You will select an advanced methods topic and complete a 50-minute presentation to the class. **I must approve your topic, and another student in class may not cover the topic.** Some examples include the following:

1. Confirmatory factor analysis
2. Structural equation modeling
3. Survey design
4. Advanced qualitative theory and coding strategy (e.g., consensual qualitative research)

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<thead>
<tr>
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<tbody>
<tr>
<td>Ability to use method to formulate research questions appropriate for professional research and publication in counseling</td>
<td>10</td>
<td>9-8</td>
<td>7-5</td>
<td>4-1</td>
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<tr>
<td>Provides information related to method including procedures (i.e., how to do it), theory, and limitations</td>
<td>10</td>
<td>9-8</td>
<td>7-5</td>
<td>4-1</td>
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<tr>
<td>Explains design and approach to quantitative/qualitative data analysis. What do you get? What does it tell you?</td>
<td>5</td>
<td>4</td>
<td>3-2</td>
<td>1</td>
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<td>Presentation is clear, free from grammatical/spelling errors. Handouts and resources are helpful and clear. Presentation is at least 50 minutes long</td>
<td>5</td>
<td>4</td>
<td>3-2</td>
<td>1</td>
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