CNEP 6370: ADVANCED QUANTITATIVE ANALYSIS
Texas A&M University - Corpus Christi
Department of Counseling and Educational Psychology

COURSE SYLLABUS

PROFESSOR: Dr. Joshua C. Watson
OFFICE: ECDC 151
TELEPHONE: 361-825-2739
EMAIL: joshua.watson@tamucc.edu
OFFICE HOURS (Spring 2016): MWR 2:00-4:00 or by appointment

I. Course Description

This class will focus on expanding each student’s knowledge of research design and statistical analysis beyond CNEP 6360 and EDLD 6392. Specific topics will include general linear model approaches to analysis of variance and regression analyses. Students will utilize SPSS to complete regularly assigned problems in order to demonstrate their competence. In addition, a special emphasis will be placed on the development of advanced quantitative skills needed to evaluate programs and student processes within a counselor educator model.

II. Rationale

This is a research course, emphasizing techniques in 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 for School Counselors

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

IV. TExES School Counselor Competencies

*Competency 004 (Program Management):* The school counselor understands how to plan, implement, and evaluate a developmental guidance program, including counseling services, which promotes all students’ success (Standard I).

*Competency 006 (Counseling):* The school counselor understands how to provide effective counseling services to individuals and small groups (Standard F)

*Competency 010 (Professionalism):* The school counselor understands and complies with ethical, legal and professional standards relevant to the profession Standard E).
V. Course Objectives and Learning Outcomes

A) Objectives Related to CACREP Standards

This course is designed to meet 2016 CACREP standards included in Section 6 (doctoral professional identity). The following standards are covered in this course. Standards shown in **bold type** represent the targeted course objectives that will be assessed in this course throughout the semester.

**Doctoral Standards**

- CACREP Standard 6-B-1-e: Methods for evaluating counseling effectiveness.
- CACREP Standard 6-B-4-a: Research designs appropriate to quantitative and qualitative research questions.
- CACREP Standard 6-B-4-b: Univariate and multivariate research designs and data analysis methods.
- CACREP Standard 6-B-4-g: Research questions appropriate for professional research and publication.
- CACREP Standard 6-B-4-h: Professional writing for journal and newsletter publication.
- CACREP Standard 6-B-4-l: Ethically and culturally relevant strategies for conducting research.

B) Objectives Related to Program Standards

Upon successful completion of this course, students will have developed a knowledge and understanding of the following:

- Research ethics
- Models and methods of assessment and the appropriate use of collected data
- Univariate and multivariate research designs and related data analysis methods
- Process for developing questions appropriate for professional research and either presentation at conferences or publication in journals related to the field of counseling
- Process for creating research designs appropriate for professional research and either presentation at conferences or publication in journals related to the field of counseling
In addition, each student will develop and be able to demonstrate an understanding of the following statistical practices and/or concepts:

- How data is collected and how said observations are quantified during the scientific and research process
- How observations are represented and stored in a data file
- The structure of a data file
- The scaling and coding of data
- The appropriate application and interpretation of the following commonly used inferential statistical procedures: ANOVA, multiple comparison designs, repeated-measures ANOVA, factorial ANOVA, ANCOVA, and discriminant analysis.

C) Learning Outcomes

The ability of students to meet the above referenced competencies and course objectives will be assessed through the use of several learning outcomes. The following is a listing of the learning outcomes established for this course, and metric used to denote successful completion of each.

- Students will be able to correctly differentiate among descriptive, experimental, and correlational designs focused on univariate parametric and nonparametric statistics as evidenced by achieving an average score of 80% or higher on all proficiency demonstration assignments.
- Students will be able to successfully formulate research questions specific to counseling research as evidenced by achieving a score of 80% or higher on the midterm examination and an average score of 80% or higher on all proficiency demonstration assignments.
- Students will be able to successfully design and evaluate univariate parametric and nonparametric research designs appropriate for addressing established research questions as evidenced by achieving an average score of 80% or higher on all proficiency demonstration assignments.
- Students will successfully conduct a research project consistent with guidelines for publication relevant to the counseling profession as evidenced by achieving a score of 80% or higher on the research presentation assignment.
- Students will apply to effectively conduct quantitative evaluations specific to the assessment of counseling effectiveness as evidenced by achieving a score of 80% or higher on the midterm and final examinations and an average score of 80% or higher on all proficiency demonstration assignments.
• Students will successfully demonstrate the ability to conduct a literature review on a counseling-related topic as evidenced by achieving a score of 80% or higher on the research presentation assignment.

• Students will correctly identify salient differences in various quantitative sampling procedures as evidenced by achieving a score of 80% or higher on the midterm examination.

• Students will demonstrate the ability to correctly utilize statistical concepts appropriate for descriptive, experimental, and correlational designs focused on univariate and parametric and nonparametric statistics as evidenced by achieving a score of 80% or higher on the midterm and final examinations and an average score of 80% or higher on all proficiency demonstration assignments.

VI. Course Topics

• One-Way Analysis of Variance (ANOVA)
• Model Assumptions
• Statistical Power
• Effect Size and Confidence Intervals for Effect Sizes
• Fixed, Mixed, and Random-Effect Models
• Multiple Comparisons
• Factorial Design ANOVA
• Repeated Measures ANOVA
• Analysis of Covariance (ANCOVA)
• Nonparametric Designs
• Linear Discriminant Analysis (LDA)

VII. Instructional Methods and Activities

This course will be presented using a variety of teaching modalities. Course content will be presented in a traditional lecture format followed by class discussion and experiential learning activities. Hands on activities using statistical software packages and calculators will be used to supplement student learning.

In addition to meeting all course objectives laid out in this syllabus, students are required to become familiar with Blackboard as it will serve as the primary repository for the information and files to be used throughout this course. Students can access the Blackboard homepage for this course at: https://bb9.tamucc.edu/ using their TAMUCC login.

VIII. Evaluation and Grade Assignment

A) Major Course Assignments
**Proficiency Demonstrations (200 points)**

A series of proficiency demonstrations will be assigned throughout the semester to assess your understanding of the material being presented. These assignments are designed to provide you with experience conducting various statistical analyses using current statistical software packages (SPSS, G*Power, Excel, etc.) and interpreting your results. Each assignment will be graded on a 25-point scale with points being allocated using the scoring rubric provided in the appendices included at the end of this document. Students are to submit their assignments electronically through Blackboard. Once graded, students will receive their assignments with the track changes feature enabled so they can review any comments and/or edits made by the instructor and submit a revised version of the assignment should they choose to do so (this option is not available to students who earn an unacceptable score – see Appendix A). Submitting a revised homework provides students with the opportunity to potentially earn back half of the points originally lost. At the end of the semester, all proficiency demonstration scores will be summed and a total score will be computed for this particular class assignment. The maximum number of points that can be earned on the proficiency demonstrations is 200.

**NOTE 1:** Students are permitted, and even encouraged, to work together in groups to complete their proficiency demonstration assignments. My experiences teaching this course have shown that students tend to perform better when small study groups are used to complete proficiency demonstrations and prepare for examinations. Although you may be working in groups, each student still is required to turn in his/her own assignment.

**Examinations (200 points)**

There will be two (2) examinations administered, a midterm and a final. The examinations will emphasize lecture material, assigned readings, problems worked in class, and proficiency demonstration assignments. Examinations will not be cumulative. The midterm will cover material discussed in the first half of the course and the final will cover all new material presented after the midterm examination. Examinations will be constructed using a variety of question types including multiple choice, short answer, computational, and SPSS output interpretive questions. The maximum number of points to be earned on each examination is 100.

**Research Presentation Project (100 points)**

During the course of the semester, each student will select a research or data analysis project requiring some design(s) covered in the course, obtain a dataset, analyze the data, and present the findings (written up in APA 6th edition style) as a poster presentation suitable for use at a professional conference. Students must have their topic and the scope of their presentation approved in advance by the instructor. A more detailed description of this assignment will be distributed at the beginning of the semester. Posters will be presented on the date specified in the course syllabus, and will be evaluated by a panel of reviewers using the rubric included in this syllabus (see Appendix B). Scores will be averaged and the mean score will be used as the student’s grade for this assignment. The maximum number of points that can be earned on this presentation is 100.
NOTE 2: Students are expected to adhere to the APA style guidelines (6th ed.) for all written assignments submitted. Papers are expected to be of professional quality including clear and concise language, free of any grammar and punctuation errors, and organized to flow. In addition, all work submitted should be the result of the student’s own original efforts. Submitted assignments that do not meet these standards will be graded accordingly.

B) Point Allocation

Proficiency Demonstrations (8 @ 25pts each) 200 points  
Midterm Examination 100 points  
Final Examination 100 points  
Research Presentation Project 100 points

TOTAL 500 points

C) Grade Distribution

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<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
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<td>450-500</td>
<td>400-449</td>
<td>350-399</td>
<td>300-349</td>
<td>Below 300</td>
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IX. Course Schedule and Policies

A) Course Schedule

See schedule for the current academic semester included at the end of this syllabus.

B) Course Policies

Attendance

Students are expected to attend each scheduled class session. While I believe class attendance to be important, I also realize that as adult learners, students have lives and responsibilities outside the classroom. When unexpected events or emergencies such as personal illnesses, family crises, or a death in the family arise, I ask that you communicate with me as soon as possible so that I am aware of the situation and we can work together to devise a mutually agreeable course of action. Under these circumstances, absences will be considered “excused” upon receipt of appropriate documentation (doctor’s note, court paperwork, obituary, etc.) and written approval from your instructor. Additional excused absences will be granted for participation in a religious holy day as outlined in the University catalog.

For absences that are not excused, the follow attendance policies are in place:

- Students are permitted only one unexcused absence without penalty during the semester. Upon a second unexcused absence, students will incur a 10% reduction in their final grade.
- Following a third unexcused absence, students will either receive a failing grade for the
course or be administratively dropped from the course.

- Arriving late or leaving early to class is discouraged. Two such instances will count as an unexcused absence.
- Students sleeping or acting unprofessionally in class will be asked to leave. Should a dismissal result in the student missing more than 50% of the class period, an unexcused absence will be issued.

**Professionalism**

By enrolling in a graduate program you have begun your professional career. As such, the expectation is that you will conduct yourself as a professional. A significant part of being a professional is being respectful to your peers and instructor at all times. Examples of disrespectful, and unprofessional, behavior include: talking in class, not paying attention, criticizing others’ thoughts and beliefs, falling asleep, or texting/talking on a phone. While it is understandable that there may be times when you are not in total agreement with your peers or instructor, respect for the academic environment and the professional degree being pursued should **always** be acknowledged.

**Statement of Civility**

Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. The University’s goal is to provide you with a high quality educational experience that is free from repression. To assist in meeting this goal, you are responsible for following the rules of the University, city, state, and federal government. You are expected to behave in a manner that is dignified, respectful, and courteous to all people; regardless of gender, ethnic/racial origin, religious background, age, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

**Late Submissions of Student Work**

All assignments are to be submitted online to the course Blackboard page prior to the beginning of class on the due date specified in the course calendar (see end of syllabus). Assignments not received prior to the beginning of class will be considered late. A letter grade deduction will be applied to all late submissions that were not discussed with your instructor in advance. Assignments not turned in 30 days after the due date will no longer be accepted and students will receive a zero for that particular assignment.

**Missed Examinations**

Examinations missed due to student absence will receive a grade of zero unless prior arrangements have been made with your instructor, or a legitimate medical emergency precludes you from completing the examination at its assigned date and time. Examinations missed as a result of an excused absence will be rescheduled at a date and time determined by your instructor.
Extra Credit

As a general rule, extra credit opportunities will not be extended in this course. Course grades should be reflective of the proficiency level students are able to demonstrate through all course assignments and assessments. Requests to award additional points without just cause or to assign alternative/additional work for credit will be denied.

Academic Integrity and 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 the instructor might possibly apply to individual cases of academic dishonesty include:

- Written reprimand
- Requirement to re-do work in question
- Requirement to submit additional work
- Lowering of grade on work in question
- Assigning grade of "F" to work in question
- Assigning grade of "F" for course
- Recommendation for more severe punishment, such as dismissal from program or 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 on the appropriate steps for initiating the process.

**Dropping a Class**

My hope is that you never find it necessary to drop this or any other class during your program of study. With that being said, I realize events sometimes occur that make dropping a course a necessary and wise decision. If you ever find yourself in a situation like this, I ask that you consult with me before you decide to drop the course to be sure it is your best option. Should dropping the course prove to be the best action for you to take, it is your responsibility to initiate the drop process by going to the Student Services Center and filling out a course drop form. Simply discontinuing your attendance and participation WILL NOT automatically result in your being dropped from the class, and a final grade will be issued.

**Communication**

Each TAMUCC student has access to an individual e-mail account assigned to them by the university. This is the primary method through which your instructor will communicate with you throughout the semester. At the beginning of the course, students should make sure they have activated their account and make plans to check the account regularly. Students can expect to receive a response to their queries form their instructor within 48 hours (excluding weekends and university-recognized holidays).

**X. Textbooks**

**Required:**


**Statistical Software Package:**

SPSS® Graduate Pack V.20.0 or higher (Software is also loaded on several computers on campus for your use)

**Optional (recommended but NOT required):**


XI. Bibliography


**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 website at [http://www.tamucc.edu/provost/university_rules/index.html](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. Disability 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 Disability Services at (361) 825-5816 or visit their office in Corpus Christi Hall, Room #116. 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 at (361) 825-5816.
XIV. Academic Continuity

In the event of an unforeseen adverse event such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi, this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

XV. Course Assignment Evaluation Rubrics

See Appendices at the end of this syllabus document.
### Tentative Course Schedule (Spring 2016)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic and Assigned Readings</th>
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<tbody>
<tr>
<td><strong>Unit 1</strong></td>
<td>One-Way Analysis of Variance (ANOVA)</td>
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<td></td>
<td>- Model rationale</td>
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<td>- Model assumptions</td>
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<td></td>
<td>- Computation and interpretation</td>
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<td>- Multiple comparisons</td>
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<td>- Fixed, mixed, and random-effect models</td>
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<td>- Post-hoc analyses</td>
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<td><strong>Unit 2</strong></td>
<td>Statistical Power and Effect Size</td>
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<td>- Significance in counseling research</td>
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<td>- Estimates of power and effect</td>
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<td>- A priori and post-hoc analyses using G*Power</td>
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<td><strong>Unit 3</strong></td>
<td>Factorial Analysis of Variance</td>
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<td>- Model rationale</td>
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<td>- Model assumptions</td>
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<td></td>
<td>- Computation and interpretation</td>
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<td>- Multifactor designs</td>
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<td>- Split-plot analyses (SPANOVA)</td>
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<td><strong>Midterm Examination</strong> – exam will cover units 1 – 3</td>
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<td><strong>Unit 4</strong></td>
<td>Repeated-Measures Analysis of Variance</td>
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<td>- Model rationale</td>
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<td>- Model assumptions</td>
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<td>- Computation and interpretation</td>
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<tr>
<td><strong>Unit 5</strong></td>
<td>Analysis of Covariance (ANCOVA)</td>
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<td>- Model rationale and selection of covariates</td>
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<td>- Model assumptions</td>
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<td></td>
<td>- Computation and interpretation</td>
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<tr>
<td><strong>Unit 6</strong></td>
<td>Nonparametric Designs</td>
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<td>- Introduction to the Mann Whitney U-test</td>
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<td>- Introduction to the Sign Rank test</td>
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<td>- Introduction to the Kruskal-Wallis test</td>
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<td>- Introduction to the Friedman test</td>
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<td></td>
<td>- Computation and interpretation</td>
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<td></td>
<td><strong>Final Examination</strong> – exam will cover units 4 – 6</td>
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**APPENDIX A**  
*Proficiency Demonstration Evaluation Rubric*

<table>
<thead>
<tr>
<th>Rating</th>
<th>Qualitative Interpretation</th>
<th>Score</th>
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</table>
| **Excellent** | Student has correctly answered all of the questions included in the assignment. Steps are clearly labeled and the student has shown all of his/her work.  
Data interpretation is accurate and results are reported in the style and format (i.e., APA) appropriate for counseling research.                                                                                                                    | 23-25   |
| **Good** | Student has either responded to one or two questions incorrectly or has made minor computation errors in several problems. Steps are clearly labeled and the student has shown all of his/her work.  
Data interpretation is accurate and results are reported in the style and format (i.e., APA) appropriate for counseling research with only minor errors.                                                                                   | 20-22   |
| **Marginal** | Student has either responded to one or two questions incorrectly and has made significant computation errors in several problems. Steps are vaguely labeled and the student has shown all of his/her work.  
Data interpretation is slightly inaccurate and results are reported in the style and format (i.e., APA) appropriate for counseling research with several errors being noted.                                                               | 17-19   |
| **Unacceptable** | Student has either failed to address every question or provided incorrect responses to the majority of problems presented. There is no work shown for any of the problems and the entire assignment is of poor quality.  
Data interpretation is wholly inaccurate and the reporting style used is not consistent with generally accepted practice in counseling research.                                                                                     | 16 or below |

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**student score**
<table>
<thead>
<tr>
<th>APPENDIX B</th>
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<tr>
<td>Research Poster Presentation Evaluation Rubric</td>
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<tr>
<th>Quality of Poster Content</th>
<th>Unacceptable (0-9 pts)</th>
<th>Marginal (10-11 pts)</th>
<th>Good (12-13 pts)</th>
<th>Excellent (14-15 pts)</th>
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<tr>
<td>Main points of the introduction, statement of the problem, purpose of the study, and research questions are not addressed or poorly organized.</td>
<td>Main points of the introduction, statement of the problem, purpose of the study, and research questions are adequately addressed though not as well-organized.</td>
<td>Main points of the introduction, statement of the problem, purpose of the study, and research questions are sufficiently addressed in a fairly well-organized manner.</td>
<td>Main points of introduction, statement of the problem, purpose of the study, and research questions are addressed in thorough, concise, and organized manner.</td>
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| Discussion of Methods and Analyses Used | Analyses selected are inappropriate for the research questions asked. No explanation for the selection of these analyses is presented. | Analyses selected are appropriate though not the best choice for the research questions asked. Little to no explanation for the selection of these analyses is presented. | Analyses selected are appropriate for the research questions asked. A brief explanation for the selection of these analyses is presented. | Analyses selected are appropriate for the research questions asked. A thorough explanation for the selection of these analyses is presented. |

| Presentation of Results | Results are poorly communicated. No apparent organization was used in the design. Results are not tied to the research questions asked. | Communicates the most important results in a manner that is unclear and disorganized. Results are minimally tied to the research questions. | Communicates the most important results in a manner that is mostly organized, specific, and concise. Results ties to research questions. | Communicates the most important results obtained in an organized, specific, and concise manner. Results are tied to research questions. |

| Discussion Section and Conclusions | Connection between results and how they can be utilized was not made. Limitations of the study were not addressed, and not suggestions for future research were offered. | Partially mentions how results can be utilized and by whom. Major limitations of the study are overlooked and the next steps to be taken are not well thought out. | Mentions how results can be utilized and by whom. Briefly addresses limitations and the next steps to be taken. | Mentions how results can be utilized and by whom. Clearly addresses limitations to the study and describes the next steps to be taken. |

| Visual Aesthetics | Graphics used do not enhance the presentation in any way. Use of font sizes/variations and headings is mostly distracting to the viewer. | Graphics used adequately enhance the presentation. Use of font sizes/variations and headings is inconsistent and distracting. | Graphics used enhance the presentation. Use of font sizes/variations and headings make the overall flow of the poster more clear. | Graphics used are engaging and enhance the presentation. Use of font sizes/variations and headings help the overall clarity of the poster. |

| Oral Presentation | Narration and/or the answering of questions is wholly lacking. | Narration and/or the answering of questions is somewhat lacking. | Narration and/or the answering of questions is adequate, and adds to the presentation. | Narration and/or the answering of questions is engaging, thorough, and adds greatly to the presentation. |

| Adherence to APA Format | Data obtained from other sources is not cited at all. APA style is incorrectly used throughout. | Some data obtained from other sources is appropriately cited. APA style is either inconsistent or incorrect. | Most data obtained from other sources is appropriately cited. APA style is accurate. | All data obtained from other sources is appropriately cited. APA style is accurate. |

| Grammar and Spelling | Poor presentation with excessive spelling and/or grammar mistakes evident. | Adequate presentation although several noticeable spelling and/or grammar mistakes evident. | Good presentation with minimal spelling and/or grammar mistakes evident. | Clean presentation, with no spelling and/or grammar mistakes evident. |