GSR 517 Statistical Methods II-DEAdd-2018-03-21

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Course Level*	graduate-level

Distance Education Section

- Complete this section only if adding Distance Education to a New or Existing Course

Course Prefix /Number*	GSR 517
Course Title*	Statistical Methods II
Type of Proposal*	*See CBA, Art. 42.D.1 for Definition* online
Brief Course Outline*	*Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar or assignments* *As outlined by the federal definition of a "credit hour", the following should be a consideration regarding student work - For every one hour of classroom or* *direct faculty instruction, there should be a minimum of two hours of out of class student work.* Using computer programs, a wide array of statistical procedures for research workers are explored. Basic concepts of statistical inference and prediction are reviewed, including regression analysis and prediction, hypothesis testing, analysis of variance and covariance, and partial and multiple correlation. Emphasis is placed on use of computers and interpretation of computer printouts along with understanding techniques employed. No computer knowledge is necessary. Prerequisite: GSR 5l6 or equivalent. This course is being prepared as a distance education course for the Nursing Department to be used in their Nursing PhD program. In its current format, the course is taught as a hybrid course with face-to-face meetings on two sets of two back-to-back days. Each day includes about 7 hours of instruction for a total of 28 face-to-face hours of instruction. The remaining hours are handled on-line. Students have a difficult time learning Statistics when material is packed into fourteen hours of instruction on consecutive days.

Rationale for Proposal (Required Questions from CBA)	
How is/are the instructor (s) qualified **in the Distance Education delivery** **method as well as the discipline?***	I am a statistician with nine years of experience working in a Pharmaceutical company. I was the Coordinator of the IUP Applied Research Lab for six years, where I helped graduate students with theses and dissertations. I have also taught every single cohort in the Nursing PhD program using the hybrid course format discussed in the background section above. I have already assembled for these hybrid classes a collection of YouTube videos covering relevant topics and I have recorded additional videos using Camtasia software to cover topics for which I could not find high-quality videos online. I have been using D2L extensively for organizing material for the course, for collecting assignments and for providing feedback to students.
For each outcome in the course, describe **how the outcome will be achieved using** **Distance Education technologies. ***	I have developed main objectives from teaching this course many times to students in the Nursing PhD program. Here are four major objectives. **Course Objective 1: Understand concepts of statistical testing and apply the process for testing research questions to different situations.** **Students will be asked to read assignments from the textbook and to study posted handouts in D2L covering the concepts relevant to testing research questions. Students will then take online quizzes to test them on the concepts. Different hypothetical and real abstracts will be posted to a discussion forum. Students will then engage each other in a thoughtful analysis of the abstracts. Finally, each student will discuss the concepts in an abstract from a relevant interesting article that they find in the literature.** **Course Objective 2: Understand concepts such as power and effect sizes and use power analysis software (G*Power) to determine appropriate sample size for a study.** **Students will be asked to read assignments from the textbook and to study posted handouts in D2L covering the concepts relevant to sample size and power. Students will watch videos showing how the G*Power software is used to determine appropriate samples sizes for studies. Students will then take online quizzes to test them on the concepts. Different hypothetical and real abstracts will be posted to a discussion forum. Students will then individually use the software to estimate appropriate sample sizes for these abstracts.** **Course Objective 3: Select the most appropriate statistical tool for answering the most common research questions** **Students will be asked to read assignments from the textbook and to study posted handouts in D2L covering the concepts relevant to choosing statistical tools. Students will then take online quizzes to test their ability to select the best statistical tools. Finally, a tool will be presented in the online forum and each student will propose a study that they feel would be best analyzed with the given tool. It will be the responsibility of the student proposing the study to respond to the subsequent feedback that is posted by other students.** **Course Objective 4: Generate the required analysis in SPSS, interpret the SPSS output, generate tables and graphical representations, and write conclusions in the APA style.** **Reading assignments from the textbook and prepared handouts covering the major analyses (multiple linear regression, multiple logistic regression, single- and multi-factor ANOVA, non-parametric methods) commonly used in dissertations will be posted in D2L. Students will then take online quizzes to test them on the concepts. Students will watch videos showing how the SPSS software is used for each analysis and how the output is interpreted. For each of the analysis types, students will be presented with data and corresponding research questions. Students will analyze, interpret, and write up their analyses, including appropriate APA tables and figures. In addition, there will also be a final project where each student formulates their own research questions, collects relevant data using Qualtrics from a survey of randomly selected undergraduate IUP students, analyzes the data, and summarizes the findings of their analysis. See representative course module at the end of the document.**

How will the instructor-student and **student-student interaction take place?*** **(if applicable)**	Instructor-student interaction will take place by several methods. The instructor will interact with students via the threaded discussion message board. The instructor will post discussion questions on the message board relating to the assigned readings and will invite students to respond. I am currently also exploring how I can use "Nearpod," an interactive presentation and assessment tool, to facilitate instructor/student and student/student interaction. With Nearpod, I can compile online presentations--with slides, videos, URL's to critical websites, and pdf documents-- and then insert preplanned assessment activities using formats such as multiple choice, open-ended responses, and interactive whiteboards. Instructor-student interaction will also take place via regular email messages to all students regarding general course issues and individual email messages to students who required more help. Interaction will also occur during assignment grading when feedback is provided to students. Finally, the instructor will be available as needed by email, skype, telephone, or face-to-face conversations with individual students during office hours or by appointment. When the instructor notices a more wide-spread difficulty with concepts or software, the instructor will post comments to the discussion board record and post videos with help on the topic. I also use the desk-top-sharing software "TeamViewer" with students who are struggling with the SPSS software. Student-student interaction will take place in several threaded discussion forums. In addition to responding to the instructor's posts, students will be encouraged to engage each other in thoughtful analysis of issues raised in these threads. It should be noted that students in the PhD nursing program are in cohorts that meet regularly over time and have developed healthy relationships of support with each other.
How will student achievement be evaluated?	Student achievement will be evaluated as follows. **a)** Class Participation on threaded forums and Nearpod 10% **b)** Online Quizzes in D2L and Nearpod covering relevant concepts 20% **c)** Four Analysis papers 40% **d)** Final Project 30%
How will academic honesty for tests **and assignments be addressed?***	In addition to clearly communicating the expectations of academic honesty in the Graduate Handbook to my students, I will also design the course evaluative assignments discussed in this document to minimize the potential for violations of academic integrity. Here are my strategies, broken down by the evaluation categories in section A4). Note that I don't mind that students talk to each other about the assignments and help each other out. In fact, that is a healthy way for students to deepen their understanding of the material, but the actual analysis and interpretation should be their unique effort. **Participation in threaded forums and Nearpod(a)** These activities require students to present original ideas and thoughts in their own words, making it difficult to engage in academic dishonesty. **Online quizzes(b)** Quizzes will have randomized ordering of questions and responses, which makes it more difficult for students to collaborate with each other. In addition some questions on each quiz will change from student to student. Nearpod allows me to ask open-ended questions and use interactive whiteboards which minimize the potential for violations of academic integrity. **Analysis Papers(c)** Although all the students get the same analysis assignments, each assignment involves extensive written sections with interpretations. Since students express ideas in their own words, it is easy to tell when students are engaging in academic dishonesty. Students are also required to submit their SPSS syntax. I am considering making the names of some of the variables in the SPSS data set unique for each student. Although the students will have the same data, they would be forced to submit their own SPSS syntax, since their variable names are different. **Final Project (d)** Each person will have their own research questions, surveys, and data, so substantial collaboration is impossible.

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