

BIO 6043 – Research Design, 3 units
Point Loma Nazarene University
Biology Department, Fall 2019

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Course Info: Predominantly on-line course delivery
Meet on five selected Wednesdays: 5:30pm-8:00pm (see schedule)
Mission Valley campus, 4007 Camino del Rio S, San Diego, 92108, Room 204
Final Exam assigned Dec 10 and due Dec 17, 2019

PLNU Mission: To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Course Description

This course promotes understanding of both qualitative and quantitative research design in science education with a focus on current trends in the field. The course will promote understanding of both traditional science research as well as science education research, and will also prepare students to design and conduct a pilot study.

Course Learning Outcomes

By the end of the course, students will be able to...

- Identify the components of quantitative and qualitative methods, similarities and differences, and some of the arguments for the use of each form of research
- Describe mixed methods approaches to research
- Interpret various statistical techniques, including descriptive (mean, median, mode) and inferential (e.g. t-test, correlation) statistics
- Carry out and communicate various types of data analysis (quantitative and qualitative)
- Develop research questions that are based on and build upon a critical appraisal of existing research
- Design a study to address a research problem

Course Credit Hour Information

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request.

Schedule

The course will include five on-campus meetings during the semester; students are expected to attend all five sessions. During other weeks, students will have assigned readings and will be expected to participate in threaded discussions online. Substantial writing assignments will be due throughout the semester, and a take home final will be due near the last day of the semester. Since this is a 3-unit course, it is expected that students will spend approximately 9 hours each week doing the reading, participating in discussions, and completing assignments.

Assignments and discussion board prompts will be posted each Wednesday before 5:00PM.

Week	Date	Topic
1	Sept 4	Introduction to mixed methods research (Meet in person, Mission Valley campus)
2	Sept 11	Quantitative methods – Descriptive Statistics
3	Sept 18	Quantitative methods – <i>t</i> -tests
4	Sept 25	Quantitative methods – ANOVA & Chi sq (Meet in person, Mission Valley campus)
5	Oct 2	Quantitative methods – Correlation and Linear Regression
6	Oct 9	Mixed Methods revisited (Meet in person, Mission Valley campus)
7	Oct 16	Qualitative methods – Intro to interviews
8	Oct 23	Qualitative methods – Prep for interview: Analysis of research papers
9	Oct 30	Qualitative methods – Creating an interview protocol (Meet in person, Mission Valley campus- Intro to pilot study)
10	Nov 6	Qualitative methods – Conduct interviews
11	Nov 13	Qualitative methods – Analyzing interview data
12	Nov 20	Action research & Analysis of research papers
13	Nov 27	Preparation for Pilot study – Problem & Purpose
14	Dec 4	Analysis of research papers & Research question (Meet in person, Mission Valley campus)
15	Dec 11	Assignment of Final exam (due Dec 17 by midnight)

*This schedule is subject to change, and it's VERY likely it will change.

Course Materials

One book and a reader are required purchases for this course:

Book: Salkind, N.J. (2012). *Statistics for People Who Think They Hate Statistics: Excel 2010 Edition* [Paperback]. Los Angeles: Sage Publications.

Paste this [ISBN # 978-1452225234](#) into Google and you can purchase a used copy pretty cheap. There are at least a 10 of editions of this book and **I will use the Excel 2010 version** (around \$20 used on Amazon). This means that my homework assignments will come from this version, but if you get an edition that aligns with your version of Excel, I can send you the homework questions.

Reader: Available at <https://store.cognella.com/>

Type in Point Loma Nazarene University, and my last name is Cordero.

Excel: If you don't have Excel, you can download a free version from here (one of the benefits of being a student): <https://products.office.com/en-us/student/office-in-education>

Supplemental articles from other sources will be used as well.

Course grade

Grades will be determined as follows:

Discussion Board - meaningful and relevant comments in online discussions.....	30%			
Writing assignments.....	40%			
Final Exam.....	30%			
	Total 100%			
A = 90%	B = 80%	C = 70%	D = 60%	F = below 60%

Assignment Details

Reading materials. Some of the readings chosen for this course are either articles that are too old to be available electronically, or they come from journals to which the library does not have free access, or they are single chapters from books. For these reasons, a packet containing some of the readings for the course is available for purchase at www.universityreaders.com. To save you money, any articles that are available through our library website are not included in the reader, and therefore, you will need to access these on your own through the PLNU library and print them out. In addition, some readings may be posted on Canvas or you will need to access via the PLNU library website.

Writing assignments. Since this is a graduate class, it is essential that you take responsibility for your own learning. Keep in mind that some of the readings are long, but you are not expected to understand every detail, but rather to identify and understand the main ideas that the author is trying to communicate. You will be writing responses to questions that we hope will stimulate thought about ideas in the articles, or thoughts on how to use the methodologies that you will be learning. It will be helpful to read the questions before you do the reading. The answers will not be found in the paper, but rather will be constructed by you in response to what you read.

I will read your written responses, but will make minimal comments, because the learning occurs in the process of your production of the document. I expect that all written assignments be of graduate-level quality (no typos, no grammatical errors, no sentence fragments, thoughtful development of ideas, etc.). To earn full credit on written assignments, you must answer every part of each question in a well-written answer that demonstrates thought and integration of ideas.

Late assignments. Assignments must be submitted to Canvas by the due date indicated on the assignment. Assignments more than 48 hours late will automatically be scored as a C or lower. If any assignments are missing on the “last date to drop the course”, you will be automatically dropped from the course, and you will have to retake it next fall. For this semester, the drop date is Nov 8, 2019.

Final Exam Policy

Successful completion of this class requires taking the final examination **on its scheduled day**. No requests for early examinations or alternative days will be approved.

Discussion Board (asynchronous)

Each Wednesday, discussion questions on the assigned reading will be posted online. You are expected to post and respond to each prompt according to the following deadlines:

First deadline: Sundays by midnight

Second deadline: Wednesdays by midnight

For example: Go on the discussion board before Sunday at midnight, post a response to each prompt. Before Wednesday at midnight, respond to at least two of your peers. This should help to ensure that there is healthy, active discussion going on each week. Feel free to respond as frequently as you like, these guidelines are minimum requirements.

The discussions, both online and in person, will focus on the main ideas we are learning each week. I am looking for thoughtful, reflective responses that demonstrate evaluation of ideas. It is essential to the success of the class that each class member contributes valuable content and responds to others students' valuable content frequently. It is important that all participants stay on-topic. This means bringing up personal experience that helps to provide examples, comparisons, etc., but the discussions should not become a forum for “venting” about school districts, state standards, etc.

D. Board Scoring: Since I will have limited opportunities to interact in person, the quality of the online discussion is very important. Responses should reflect an understanding of the material, as well as thoughtful consideration of the importance, validity, and value of the content being discussed. Various viewpoints are valued and encouraged. Discussion question responses that you would like me to count toward your grade should be at least 100 words. This policy applies to all three of your required responses per week in the discussion forum (Sunday night response, and two replies to other students). Other shorter comments to students are welcome for the benefit of your learning and theirs. A rubric for scoring your discussion board participation is below. Each discussion board week is worth 10 points.

Weekly Online Discussion Rubric

	Initial (1 pt)	Emerging (2 pt)	Developed (3 pt)
Promptness and initiative	Posts 1 st response late AND responds late to others' posts. Responses are extremely short.	Posts 1 st response to prompt(s) on time, OR posts 2 nd response to at least two students on time. Minimum of 100 words each time.	Posts 1 st response on time AND responds to at least 2 others' posts on time. Exceeds 100 words most of the time.
Relevance of post	Posts responses that slightly relate to the discussion topic; makes short or irrelevant remarks that do not prompt further discussion.	Posts responses that are related to discussion content and connects to reading material; often prompts further discussion.	Posts relevant responses that show <i>integration</i> and <i>application</i> of course material. May pose additional relevant questions.
Mechanics	Posts/responses contain several errors in grammar, spelling, and/or sentence structure that make the posts/responses difficult to read and understand.	Posts/responses contain some errors in grammar, spelling, and sentence structure, but responses are still easy to read and understand.	Posts/responses contain very few, if any, minor errors in grammar, spelling, and sentence structure. Posts/responses are easy to read and understand.
Observation of “netiquette”: not using ALL CAPS, slang or potentially inflammatory or overly emotional language		Does not observe ‘Netiquette’ guidelines 0 pts	Observes ‘Netiquette’ guidelines 1 pt

PLNU CANVAS & TECH SUPPORT

If you have questions about the content you find in my Canvas course or need clarification on assignment instructions please let me know. If you are unsure how to use any given feature in Canvas you will find the [Canvas Guides](#) to be a very helpful resource. If you cannot access something in my Canvas course or it appears that some part of the course is not working properly, please contact the Office of Instructional Technology for support at oit@pointloma.edu. Include specific information in the request (course ID, section, assignment or module name, etc.) to expedite the troubleshooting process. Screenshots are super helpful!

PLNU Technical Support: Contact the Help Desk by emailing helpdesk@pointloma.edu, calling (619) 849-2222, or dialing extension 2222.

SPIRITUAL CARE

PLNU strives to be a place where you grow as whole persons. To this end we provide resources for our graduate students to encounter God and grow in their Christian faith. At the Mission Valley campus we have an onsite chaplain who is available during class break times across the week. If students have questions, a desire to meet with the chaplain or have prayer requests you can send an email to gradchaplainmissionvalley@pointloma.edu. In addition there are resources for your Christian faith journey available at <http://www.pointloma.edu/experience/faith/graduate-student-spiritual-life>.

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies in the Graduate and Professional Studies Catalog for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Graduate and Professional Studies Catalog for additional detail.

STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map using the below link to view which states allow online (distance education) outside of California.

<https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures>