

**BIO 643 – Research Design**  
**Point Loma Nazarene University Biology Department, Fall 2016**

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Course: Predominantly on-line course delivery  
Five Selected Tuesdays: 5:30pm-8:00pm (see schedule)  
Mission Valley campus, 4007 Camino del Rio S, San Diego, 92108  
Room TBA  
Final Exam assigned Dec 6 and due Dec 13, 2016

**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 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 on 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 Tuesday before 5:00PM.

Week	Date	Topic
1	<b>Aug 30</b>	Introduction to mixed methods research ( <b>Meet in person, Mission Valley campus</b> )
2	Sept 6	Quantitative methods – Descriptive Statistics
3	Sept 13	Quantitative methods – <i>t</i> -tests
4	<b>Sept 20</b>	Quantitative methods – ANOVA & Chi sq ( <b>Meet in person, Mission Valley campus</b> )
5	Sept 27	Quantitative methods – Correlation and Linear Regression
6	Oct 4	Mixed Methods revisited
7	<b>Oct 11</b>	Qualitative methods – Intro to interviews ( <b>Meet in person, Mission Valley campus</b> )
8	Oct 18	Qualitative methods – Prep for interview: Analysis of research papers
9	Oct 25	Qualitative methods – Creating an interview protocol
10	<b>Nov 1</b>	Qualitative methods – Conduct interviews
11	Nov 8	Qualitative methods – Analyzing interview data ( <b>Meet in person, Mission Valley campus-</b> Intro to pilot study.)
12	Nov 15	Action research & Analysis of research papers
13	Nov 22	Preparation for Pilot study – Problem & Purpose
14	<b>Nov 29</b>	Analysis of research papers & Research question ( <b>Meet in person, Mission Valley campus</b> )
15	Dec 6	Assignment of Final exam ( <u>due Dec 9</u> 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. (2010). *Statistics for People Who Think They Hate Statistics: Excel 2007 Edition* [Paperback]. Los Angeles: Sage Publications. ISBN # 978-1-4129-7102-7  
[There are dozens of editions of this book and **you must choose** the Excel 2007 version (around \$1 to \$10 used on Amazon).]

Reader: Available at [www.universityreaders.com](http://www.universityreaders.com)

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%

## 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.

## PLNU Technical Support:

Contact the Help Desk by emailing [helpdesk@pointloma.edu](mailto:helpdesk@pointloma.edu), calling (619) 849-2222, or dialing extension 2222.

## 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](http://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 e-class 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 4, 2016.

*Asynchronous discussion board.* Each Tuesday, 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: Saturdays by midnight

Second deadline: Tuesdays by midnight

For example: Go on the discussion board before Saturday at midnight, post a response to each prompt. Before Tuesday 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.

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 the grade for this course should be at least 100 words. This policy applies to all three of your required responses per week in the discussion forum (Saturday night response, and two replies to other students). Other shorter comments to other students are welcome for the benefit of your learning and theirs. A rubric for scoring your discussion board participation is included below.

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.

### Weekly Online Discussion Rubric

	1 point	2 points*	3 points
Promptness and initiative	Posts 1 <sup>st</sup> response late, OR didn't answer all prompts, OR responds late for 2 <sup>nd</sup> posting OR posts are less than 100 words each.	Posts 1 <sup>st</sup> response to all prompts on time, AND posts 2 <sup>nd</sup> response to at least two students on time. Min of 100 words each.	Responds on time to other's posts more frequently than the minimum required.
Relevance of post	Posts responses which slightly relate to the discussion topic; makes short or irrelevant remarks.	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.
Connections to professional practice	Little evidence of reflective thought pertaining to personal perspectives and professional development	Some evidence of reflective thought pertaining to personal perspectives and professional development	Strong evidence of reflective thought pertaining to personal perspectives and professional development

\*An average score of "2" is a satisfactory score and should be your minimum goal each week.

### 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, Rev. Nancy Pitts who is available during class break times across the week. If students have questions, a desire to meet with Rev Pitts or prayer requests you can contact her directly at: 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**

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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**

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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**

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If you have a diagnosed disability, please contact Jean Moncada in the Center for Student Success (CSS) within the first two weeks of class to demonstrate need and to register for accommodation by phone at (619) 563-2849 or by e-mail at [jmoncada@pointloma.edu](mailto:jmoncada@pointloma.edu). Ask your academic advisor or program director for any additional accommodation information.

## **PLNU ATTENDANCE AND PARTICIPATION POLICY**

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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.