

**BIO 6011 - SCIENCE EDUCATION SEMINAR (3 units)**  
**Syllabus, Spring 2020**

**Instructor:** Dr. Jen Lineback  
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**Course Reader:** Available through Cognella® (<https://store.cognella.com/21960>.)

**Class Sessions:** Select Wednesdays, from 5:30 – 8:00pm (see schedule on Page 5)

**Purpose of course**

The science education seminar is intended to provide opportunities for biology graduate students to examine learning theories from a variety of perspectives and explore current trends in educational research.

Teaching and learning in science is a means of impacting other people by leading them into an opportunity to learn about the natural world. As a Christian university, PLNU approaches this study of God's creation with a sense of reverence and awe that distinguishes this university from others.

**Learning Outcomes**

- Students will compare and contrast the major theories in the field of science education.
- Students will classify both current and seminal papers from top-tier science education journals in terms of their theoretical perspective.
- Students will describe current areas of research in science teaching and learning and identify the theoretical perspectives informing studies in these areas.
- Students will articulate the relevance of learning theory to their own area of study.

**Schedule**

During the 15 weeks, you will be required to read articles, participate in the group-threaded discussions online, and submit individual answers to questions about the articles. Since this is a 3-unit course, it is expected that students will spend approximately 9-10 hours each week reading the articles and answering questions, both in the discussion format (online most weeks) and as answers submitted to the instructor. *I highly recommend you carve out two or three large chunks of time during your week to be able to complete the work in 9 hours.* For example, three 3-hour blocks during the week. I have found that students that try to "squeeze in" an hour here and there during the week tend to spend 12 or more hours each week because they have to spend time repeating/reviewing reading that they had already completed.

**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 many of the readings for the course is available for purchase at: Cognella® (<https://store.cognella.com/21960>.) 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. I will teach you how to do this during our first in-person class meeting.

### Course grade

Grades will be determined by:

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|---|-----|
| 1. article/chapter writing assignments (assigned weekly)                      | 20% |
| 2. consistent and meaningful participation in online discussions (see rubric) | 20% |
| 3. collaborative group project  | 20% |
| 4. written exams (midterm and final)  | 40% |

At the end of the semester, a letter grade for the course will be based on the following scale:

<b>A</b>	<b>A-</b>	<b>B+</b>	<b>B</b>	<b>B-</b>	<b>C+</b>	<b>C</b>	<b>C-</b>	<b>D</b>	<b>F</b>
93- 100%	90- 92%	87- 89%	83- 86%	80- 82%	77- 79%	73- 76%	70- 72%	60- 69%	Below 59%

### Article/chapter 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, and I am not expecting that you necessarily understand every detail in the paper, but rather to determine the main ideas that the author is trying to communicate. You will be writing responses to questions that I hope will stimulate thought about ideas in the articles and will encourage you to reflection upon how this new information relates to your prior knowledge. It will be helpful to read the questions before you read the papers. The answers will not be found in the paper, but rather will be constructed by you in response to what you read.

While either I or my grader (Heather) will make a few comments on your paper, please understand that the majority of your 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 turned in by the due dates listed in the schedule below. 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 next spring. This drop date is: **March 7, 2020.**

### Online discussions

For most weeks, discussion questions on the assigned reading for the week will be posted on Canvas. You are expected to post and respond to each prompt according to the following deadlines:

- First deadline: **Sunday**, by noon
- Second deadline: **Tuesday**, by midnight

For example: Do your reading for the week prior to **Sunday**. Go on the discussion board before **Sunday** at noon and post a response to each prompt. Before **Tuesday** at midnight, respond to at least two of your fellow students’ comments. 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 we 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 but less than 350 words. This policy applies to all three of your required responses per week in the discussion forum. 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 in the papers as they relate to your own teaching practice. 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."

**PLNU Grad Biology Weekly Online Discussion Rubric**

Full credit = 10 points each week

	<b>Initial (1 pt)</b>	<b>Emerging (2 pts)</b>	<b>Developed (3 pts)</b>
Promptness and initiative	Posts 1 <sup>st</sup> response late AND responds late to others' posts. Responses are extremely short.	Posts 1 <sup>st</sup> response to prompt(s) on time, OR posts 2 <sup>nd</sup> response to at least two students on time. Minimum of 50 words each time.	Posts 1 <sup>st</sup> response on time AND responds to at least 2 others' posts on time. Minimum of 100 words each.
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. May pose additional relevant questions.
Mechanics	Posts/responses contain several major errors related grammar, spelling, and sentence structure that make the posts/responses difficult to read and understand.	Posts/responses contain several minor errors related grammar, spelling, and sentence structure, but are easy to read and understand.	Posts/responses contain very few, if any, minor errors related 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  <b>0 points</b>	Observes 'Netiquette' guidelines  <b>1 point</b>	

### BIO 6011 - Tentative Weekly Schedule

Note that this is a tentative schedule of the readings, assignments, and due dates for the course. Further assignment details will be provided each week on the Canvas website under "Assignments".

Date	Topics to be discussed	
<b>1/15/20</b>	<b>In-Person Meeting #1</b>	<b>6:00-8:30pm, Room 207 Topic: Introduction to Learning Theories, Behaviorism</b>
1 - 1/15/20 2 - 1/22/20 3 - 1/29/20	Topics	Traditional Learning Theories: Behaviorism, Classic Constructivism, Constructivism in Practice
	Assignments	Readings, written responses to questions & discussion board
<b>2/5/20</b>	<b>In-Person Meeting #2</b>	<b>5:30-8:00pm, Room 207 Topic: Consideration of Traditional Learning Theories</b>
4 - 2/5/20 5 - 2/12/20	Topics	"Misconceptions," Situated Cognition, Social-Culturalism
6 - 2/19/20 7 - 2/26/20	Assignments	Readings, written responses to questions & discussion board
<b>3/4/20</b>	<b>In-Person Meeting #3</b>	<b>5:30-8:00pm, Room 207 Topic: Cross Theory Analysis; Introduce Midterm &amp; NEXT</b>
8 - 3/4/20	Assignment	<b>Midterm Exam – DUE 3/18/20 by midnight</b>  NOTE: You will <u>not</u> have a reading assignment this week. Instead, you will be asked to synthesize across the information that you have learned so far in this course.
9 - 3/18/20 10 - 3/25/20	Topics	Adult Learning Theories
11 - 4/1/20	Assignment	Readings, written responses to questions, & discussion board.
<b>4/8/20</b>	<b>In-Person Meeting #4</b>	<b>5:30-8:00pm, Room 207 Topic: Discuss Adult v. Traditional LT; Introduce Project</b>
12 - 4/8/20 13 - 4/15/20	Topics	Current Science Education Research Topics
14 - 4/22/20	Assignment	Readings, written responses to questions, & discussion board.
<b>4/29/20</b>	<b>In-Person Meeting #5</b>	<b>5:30-8:00pm, Room 207 Topic: Group Project Presentations; Introduce Final Exam</b>
15 - 4/29/20	Assignment	<b>Final Exam – DUE 5/6/20 by midnight</b>

## Links to Additional PLNU Policies:

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### [Academic Accommodations](#)

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.

### [Academic Honesty](#)

Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the result of another person's creativity and effort.

### [Education Records \(FERPA\) and Directory Information](#)

FERPA is the federal law regarding the privacy of student records.

### [Spiritual Care/Resources](#)

PLNU strives to be a place where you grow as a whole person. This link provides you with resources and email contacts in this regard.

### [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.

### [Cell Phones and Computers](#)

Appropriate use of cell phones and computers is expected during class time. 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.