

Syllabus for: BIO 4063 – Methods of Teaching Secondary Science

Spring 2021

Meeting days: <i>Tuesday</i>	Instructor: <i>Dr. Jen Lineback</i>
Meeting times: <i>1-4pm</i>	Phone: <i>619-849-2974</i>
Meeting location: <i>105 Sator Hall</i>	Email: <i>jenlineback@pointloma.edu</i>
Final Exam: <i>Tuesday, 1:30pm</i>	Office location and hours: <i>By appointment only, please email me to set one up!</i>

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 is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

COURSE DESCRIPTION

This methodology course is designed to prepare students to teach secondary-level (Grades 7-12) and college-level science. This course includes lesson planning, intentional practice of classroom management, micro-teaching, classroom observation, group and self-evaluation, active and equitable participation for culturally, ethnically, linguistically, and academically diverse learners, and formative assessment to differentiate instruction for all learners. Topics include the following: pedagogical content knowledge, curriculum selection and design, methods and modalities of science teaching, assessment, classroom application of various forms of technology, safe laboratory management and operation, integration of language arts and mathematics in the science curriculum, and professional organizations. Instruction is aligned to the NGSS (7-12) and the English Language Development Standards, and relevance to college course teaching is incorporated. Modifications for diverse learners and learners with exceptionalities are researched. Equivalent to EDU434 (undergraduate level) or EDU624 (graduate level). PLNU students who complete this course are exempt from taking EDU 434 or EDU 624 for their preliminary single subject credential. [NOTE: Future Course Number: **BIO 463**]

COURSE LEARNING OUTCOMES

	Candidate Learning Outcomes	TPE	Activities/Assignments
1	Designs instruction using state-adopted content standards and applicable ELD Standards for maximum student achievement.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Lesson Plan Assignment <ul style="list-style-type: none"> ○ Plan, Presentation, Reflection • Written Assignment #13
2	Analyzes instruction to promote a balance among science information, concepts, and engineering principles as outlined in the NGSS.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • [Observed] Lesson ASET and Analysis • Lesson Comparison Assignment • In-class Analysis of LPs
3	Designs instruction that serves to illustrate science concepts, principles, scientific investigation, and experimentation.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Lesson Plan Assignment <ul style="list-style-type: none"> ○ Plan, Presentation, Reflection
4	Understands the nature of science, the integration of engineering design, and the connections between society, technology and the environment.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • NGSS Scavenger Hunt • Lesson Plan Assignment <ul style="list-style-type: none"> ○ Plan, Presentation, Reflection
5	Designs instruction that focuses on mathematical concepts, including the importance of accuracy, precision, and estimation, and the uses and limitations of media and technology as tools.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Paper Towel In-Class Activity • Written Assignment #2 • Lesson Plan Assignment <ul style="list-style-type: none"> ○ Plan, Presentation, Reflection
6	Examines methods that encourage students to pursue science interests, especially students from groups underrepresented in science careers.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • [Observed] Lesson ASET and Analysis • In-class activity: Design a lesson to foster scientific identity
7	Understands the practices that provide ethical care when live animals are present in the classroom.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Safety Handbook In-class Discussion • Science Safety Plan
8	Designs instruction that engages students in discourse that fosters evidence-based explanations and arguments in speaking and writing.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Written Assignment #2 • Written Assignment #3 • Lesson Plan Assignment <ul style="list-style-type: none"> ○ Plan, Presentation, Reflection
9	Designs science instruction that supports students in reading increasingly complex texts.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Written Assignment #12 • Lesson Plan Assignment <ul style="list-style-type: none"> ○ Plan, Presentation, Reflection

10	Understands how to lead students during investigations and experiments, teaching them multiple ways to record, scientific data, including the use of mathematical symbols. Establishes safe practices and procedures for safe use and care of equipment and materials.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Paper Towel In-Class Activity • “Talking Science” In-Class Activity • Safety Handbook In-class Discussion • Science Safety Plan
11	Develops a plan to promotes safe practices and procedures for safe use and care of equipment and materials in the science classroom.	Subject Specific Pedagogical Skills for Science	<ul style="list-style-type: none"> • Safety Handbook In-class Discussion • Science Safety Plan

REQUIRED TEXT

- [Windschitl, Thompson, Braaten. \(2018\) Ambitious Science Teaching. Cambridge, MA: Harvard Education Press. \(Links to an external site.\)](#)

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. (Based on 37.5 hours of student engagement per credit hour, the total # of student engagement for this course is approximately, 112.5 hours.)

ASSESSMENT AND GRADING

Note: Clearly define a grading policy to avoid any confusion concerning expectations. It is most helpful if at least two things are present: 1) a point distribution and 2) a grading scale.

Student grades will be posted in the Canvas grade book no later than midnight on Tuesday of each week beginning in Week Two of this course. It is important to read the comments posted in the grade book as these comments are intended to help students improve their work. Final grades will be posted within one week of the end of the class. Grades will be based on the following:

Standard Grade Scale Based on Percentages

A	B	C	D	F
A 93-100	B+ 87-89	C+ 77-79	D+ 67-69	F Less than 59

Standard Grade Scale Based on Percentages

A	B	C	D	F
A- 90-92	B 83-86	C 73-76	D 63-66	
	B- 80-82	C- 70-72	D- 60-62	

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 on [State Authorization](#) to view which states allow online (distance education) outside of California.

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

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 PoliciesLinks to an external site.](#) 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 synchronous class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions (virtual or face-to-face), the faculty member will issue a written warning of 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. In some courses, a portion of the credit hour content will be delivered asynchronously and attendance will be determined by submitting the assignments by the posted due dates. See [Academic Policies Links to an external site.](#) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

Asynchronous Attendance/Participation Definition

A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date. Failure to meet these standards will result in an absence for that day. Instructors will determine how many asynchronous attendance days are required each week.

SPIRITUAL CARE

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development Links to an external site.](#)

USE OF TECHNOLOGY

In order to be successful in the online environment, you'll need to meet the minimum technology and system requirements; please refer to the *Technology and System Requirements* [Links to an external site.](#) information.

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your classwork.