Course Syllabus

Jump to Today Sciences Edit



Department of Biology

BIO1004/ Biotechnology and Society



F	all 2023	(Quad 2)	

10/17 - 12/08

Phone and Office Hours: Zoom, by appointment

Meeting Days: Asynchronous Instructor title and name: Dr. Paul Silva

Final Exam: Friday, Week 8

Meeting Location: Fully Online E-mail: psilva@pointloma.edu

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.

FOUNDATIONAL EXPLORATIONS MISSION

PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and cultures.

COURSE DESCRIPTION

This course is an introduction to foundational concepts in biology with an examination of current topics in biotechnology as they impact society, bioethics, and sustainable living. The course addresses the questions "What is biotechnology?", "How does it work?", and "How does it affect our lives?" Topics include genetic engineering, gene therapy, DNA fingerprinting, cloning, genetically modified organisms, antibiotic resistance, and biotechnologies related to SARS-CoV2/COVID-19 (e.g. mRNA vaccine technology and monoclonal antibody therapy). This course approach emphasizes the process of science, critical thinking, active learning, social relevancy, and building connections between case studies and general concepts of biology.

COURSE LEARNING OUTCOMES

Upon completing the course, you should be able to:

- 1. Articulate and synthesize ideas and information to others through written communication (FELO 1a)
- 2. Access and cite scientific information as well as evaluate the logic, validity, and relevance of information from a variety of sources (FELO 1c)
- 3. Examine and critique scientific information in order to arrive at reasonable conclusions (FELO 1d)
- 4. Solve problems that are quantitative in nature (FELO 1e)
- Describe the function of DNA in the cell and how it is regulated, processed and synthesized (FELO 1a)
- 6. Explain various methods utilized in biotechnology and understand how scientific methods can be applied to improve the health of individuals and sustain our environment (FELO 1a, c, d, e)

FOUNDATIONAL EXPLORATIONS LEARNING OUTCOMES (FELO)

- FELO 1a. Written: Students will be able to effectively express ideas and information to others through written communication.
- FELO 1c. Information Literacy: Students will be able to access and cite information as well as evaluate the logic, validity, and relevance of information from a variety of sources.
- FELO 1d. Critical Thinking: Students will be able to examine, critique, and synthesize information in order to arrive at reasoned conclusions.
- FELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

- 1. Text: *Biology: Science for Life with Physiology along with MasteringBiology Access Card.* Sixth Edition. Colleen Belk and Virginia Borden Maier, Pearson, 2019.
- 2. Plus Modified MasteringBiology with eText -- Access Card Package, Sixth Edition

NOTE: This text is available as print or e-text. Be sure to acquire the ACCESS code through the Pearson website:



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 4 unit class delivered over 8 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated 150 total hours meeting the course learning outcomes. Weekly time estimations are provided in the Canvas modules.

Assignment Type	Estimated Hours
Readings	49
Homework	25
Assignments	20
Quizzes	8
Discussions	16
Project	15
Exams	5

ASSESSMENT AND GRADING

Assessment Type	Total Points	% of Final Grade
Homework (x10)	100	10%
Life Application Assignments (x7)	70	7%

Other Assignments	20	2%
Current Events (x2)	80	8%
Quizzes (x10)	100	10%
Discussion Activities (x6)	120	12%
COVID-19 Peer Teaching Assignment	140	14%
Exam 1	100	10%
Exam 2	120	12%
Final Exam	150	15%



Readings and Lecture Videos - Selected readings from the textbook will be supplemented by video lectures and other instructional course materials to be posted on Canvas. All course materials are delivered asynchronously. Students are expected to review reading and lecture materials for that week on the days indicated on the course schedule (typically Monday/Tuesday). Each week, a detailed overview of selected readings, lectures and all assignments for the week will be posted on Canvas.

Homework (100 points) – All homework assignments are due by 11:59 PM PST on the scheduled due date. All homework prompts will be posted on Canvas, including links to the Pearson MasteringBiology assignment.

Life Application Assignments (70 points) – These weekly assignments (10 points each) involve a brief reading (scripture, poem, etc) and an introspective reflection by the student. They are designed to encourage thoughtful exploration of one's own faith and lived experiences within the context of the course. All life application discussions are conducted on Canvas and are due by 11:59 PM PST each week on Wednesdays.

Current Events (100 points) - These one-page write-ups are worth 50 points each. You can find any recent article from a reputable newspaper or media publication (NY Times, LA Times, Scientific American, JAMA, STATnews, etc.) that addresses an issue in biotechnology. The questions you should address in your write-up are posted on Canvas. These submissions are to be done on Canvas and are due by 11:59 PM PST on the corresponding due dates (Wednesday of Week 2, Wednesday of Week 4)

Quizzes (100 points) - You will have an opportunity to answer a few multiple-choice questions related to the course material (n=10, 10 points each), an initial state authorization verification survey, and a final quiz on the peer-teaching projects. The quizzes are open notes and are to be conducted on Canvas with a time limitation and completed by 11:59 PM PST on the due date (typically Fridays).

Syllabus for BIO1004-1 FA23 - Biotechnology And Society

Discussion Activities (120 points) - These weekly small group discussion activities involve group work related to the course material and problem-solving to be conducted on Canvas discussion boards. Discussion activities (n=6, 20 points each) typically involve an original post due on Wednesday (10 points each) and engagement/responses to other student posts by Friday of that week (10 points).

COVID-19 Peer Teaching Assignment (140 points) - You will work in groups to examine a specialized topic related to COVID-19 and relevant biotechnologies and present to the rest of the class teaching them this specialized topic. You will prepare instructional materials (brief lecture with visual aids) to be presented by your discussion group on Canvas (100 points). Your own learning and their learning will be assessed in a quiz taken at the conclusion of your discussion (20 points). Additionally, your peer teaching participation will be evaluated by your group members via a peer teaching assessment points). Thorough instructions can be found on Canvas. Topics are all related to COVID-19 and include mRNA vaccines, tests for identifying SARS-CoV2, monoclonal antibody therapies, etc. Brief (~15 min) one-on-one meetings (via zoom) between each student group and the instructor will be held between Wednesday and Friday of Week 6 to provide instructor support and feedback for students as they develop their peer teaching materials.

Exams (370 points) – All exams will be conducted on Canvas, are open notes, and cumulative. You can expect 100 points to be based upon the new material, and the remainder of the points to be based upon previous material. Exam 1 (Monday of Week 3) is worth 100 pts, Exam 2 (Monday of Week 6) is worth 120 pts and the Final Exam (Monday of Week 8) is worth 150 pts.

Extra Credit – Extra Credit assignments will be made available throughout the course. Completion of relevant chapter study modules from the textbook will earn extra credit points toward the exam. Additional extra credit opportunities covering topics in biotechnology and society will be made available throughout the course to earn extra credit points towards the final grade. All extra credit opportunities will be completed on Canvas by 11:59 PM PST on the assigned due date

Grades will be based on the following:

Grade Distribution

A=93-100	C=73-76
A-=90-92	C-=70-72
B+=87-89	D+=67-69
B=83-86	D=63-66
B-=80-82	D-=60-62
C+=77-79	F=0-59

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 distance education courses in that state. It is the student's responsibility to notify the institution of change in his or her physical location. Refer to the map on <u>State Authorization</u> (<u>https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures)</u> to view which states allow online (distance education) outside of California.

INCOMPLETE AND LATE ASSIGNMENTS

All assignments are to be submitted by the due dates posted. There may be a reduction of possible points for each day an assignment is late. If missing assignments result in your failure to meet learning outcomes, this instructor may give up to a letter grade reduction on the final grade in addition to the loss of points for missing work. No assignments will be accepted after midnight on Sunday night, 12/10/2023, the last week of class. There are no extensions beyond this final day and receiving an incomplete is not an option in a fully online course.

While there are due dates for weekly assignments, you are welcome to post your work earlier in the week. In our discussions, late work means that others may not have the opportunity to respond to your comments. It also means that you will not have the benefit of as much interaction with other students as you will have if your assignment is posted on time. If you know you will be away on the day your assignment is due, please post your work before you leave.

Assignments will be considered late if posted after midnight Pacific Standard Time on the day they are due.

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 <u>Academic Policies (https://catalog.pointloma.edu/content.php?</u> catoid=52&navoid=2919#Academic_Honesty) for definitions of kinds of academic dishonesty and further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu (mailto:EAC@pointloma.edu) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

COURSE MODALITY DEFINITIONS

- 1. In-Person: Course meetings are face-to-face with no more than 25% online delivery.
- 2. Online: Coursework is completed 100% online and asynchronously.
- 3. **Online Synchronous:** Coursework is completed 100% online with required weekly online class meetings.
- 4. Hybrid: Courses that meet face-to-face with required online components.

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

ONLINE SYNCHRONOUS CLASS ATTENDANCE

Students taking online courses with no specific scheduled meeting times are expected to actively engage throughout each week of the course. Attendance is defined as participating in an academic activity within the online classroom which includes, but is not limited to:

- Engaging in an online discussion
- Submitting an assignment
- Taking an exam
- · Participating in online labs
- Initiating contact with faculty member within the learning management system to discuss cour content.

Note: Logging into the course does not qualify as participation and will not be counted as meeting the attendance requirement.

Students who anticipate being absent for an entire week of a course should contact the instructor in advance for approval and make arrangements to complete the required coursework and/or alternative assignments assigned at the discretion of the instructor. Acceptance of late work is at the discretion of the instructor and does not waive attendance requirements.

Students may be warned if they demonstrate a lack of academic activity. After a warning, students who miss more than one week of academic activity without prior approval and arrangements with the instructor may be de-enrolled or withdrawn from a course. If the date of de-enrollment is past the last date to withdraw from a course, the student will be assigned a letter grade of "F" or "NC." There are no refunds for courses where a de-enrollment was processed after the last date to withdraw from a course.

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.**

USE OF TECHNOLOGY

In order to be successful in the online or hybrid environment, you'll need to meet the minimum technology and system requirements; please refer to the <u>Technology and System Requirements</u> (<u>https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349</u>) information. Additionally, students are required to have headphone speakers, microphone, or webcams compatible with their

computer available to use. Please note that any course with online proctored exams require a computer with a camera (tablets are not compatible) to complete exams online.

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

ARTIFICIAL INTELLIGENCE (AI) POLICY

Use of Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) is not permitted use of these tools will be treated as plagiarism.

LANGUAGE AND BELONGING

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

You may report an incident(s) using the **<u>Bias Incident Reporting Form</u>** (<u>https://cm.maxient.com/reportingform.php?PointLoma&layout_id=5</u>).

SEXUAL MISCONDUCT AND DISCRIMINATION

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at <u>pointloma.edu/Title-IX (http://pointloma.edu/Title-IX)</u>. Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at <u>counselingservices@pointloma.edu</u> (<u>mailto:counselingservices@pointloma.edu</u>) or find a list of campus pastors at <u>pointloma.edu/title-ix</u> (<u>http://pointloma.edu/title-ix</u>).

ASSIGNMENTS AT-A-GLANCE

Course Summary:

Date	Details
	Academic Honesty Verification <u>Statement</u> (https://canvas.pointloma.edu/courses/68448/assignments/928034) by 11:59pm
Tue Oct 17, 2023	Introduction to MasteringBiology for Non-Majors (https://canvas.pointloma.edu/courses/68448/assignments/928077) by 11:59pm
	WK 1 Discussion: The Art of Observation (https://canvas.pointloma.edu/courses/68448/assignments/928048) ■ ■ ■ ■
	Week 1 Readings and Lectures(History of Biotechnology and Process of Science)to do: 11:59pm
Wed Oct 18, 2023	<u>WK 1 Quiz: The Process of</u> <u>Science (Ch 1)</u> <u>(https://canvas.pointloma.edu/courses/68448/assignments/928039</u>) by 11:59pm
	序 <u>WK 1: Introduce Yourself</u> <u>(https://canvas.pointloma.edu/courses/68448/assignments/9280</u> 他by 11:59pm
	WK 1: Life Application - Listen due by 11:59pm to Your Life (Frederick Buechner)

Date	Details Due
	(https://canvas.pointloma.edu/courses/68448/assignments/928080)
	WK 1: Quiz: History of <u>Biotechnology</u> (https://canvas.pointloma.edu/courses/68448/assignments/928032) Description
	WK 1: COVID-19 Peer Teaching Groups Sign-up to do:
	WK 1 : History of Biotechnology Articles & Homework due by 11:59pm (https://canvas.pointloma.edu/courses/68448/assignments/928079)
Fri Oct 20, 2023	Ch 01 HW (https://canvas.pointloma.edu/courses/68448/assignments/9280au) by 11:59pm
	Ch 02 HW (https://canvas.pointloma.edu/courses/68448/assignments/9280@e by 11:59pm
Tue Oct 24, 2023	Ch. 01 Can Science Cure the Common Cold? Dynamic Study Module due by 11:59pm (https://canvas.pointloma.edu/courses/68448/assignments/928061)
	Ch. 02 Science Fiction_Bad Science and Pseudoscience Dynamic Study Module due by 11:59pm (https://canvas.pointloma.edu/courses/68448/assignments/928062)
	Week 2 Readings and Lecture to do: 11:59pm
Wed Oct 25, 2023	WK 2 Discussion: Designing a due by 11:59pm

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Concept Map
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Date	Details Due
	WK 5: Life Application - Mary Oliver (The Summer Day) (https://canvas.pointloma.edu/courses/68448/assignments/928088)
	WK 5: Peer Teaching Quiz Questions Due (https://canvas.pointloma.edu/courses/68448/assignments/928089)
Thu Nov 16, 2023	E <u>CH. 10 HW</u> (https://canvas.pointloma.edu/courses/68448/assignments/9280@Be by 10:59pm
Fri Nov 17, 2023	Ch. 09 Biology of Wrongful Convictions Dynamic Study Module (https://canvas.pointloma.edu/courses/68448/assignments/928066)
	Ch. 10 Genetically Modified Organisms Dynamic Study Module (https://canvas.pointloma.edu/courses/68448/assignments/928067)
	Extra Credit - Epigenetics (https://canvas.pointloma.edu/courses/68448/assignments/928022)e by 11:59pm
	WK 5 Quiz: Gene Expression, Mutation, and Cloning (https://canvas.pointloma.edu/courses/68448/assignments/928030)
Mon Nov 20, 2023	
Tue Nov 21, 2023	Ch 12 HW (<u>https://canvas.pointloma.edu/courses/68448/assignments/9283</u>) by 11:59pm

Date	Details	Due
	WK 6 Quiz: Natural Selection & <u>Antibiotic Resistance</u> <u>(https://canvas.pointloma.edu/courses/68448/assignments/928033)</u> □ □	:59pm
	Wk 6: Discussion - COVID-19 Group Meetings w/ Professor (https://canvas.pointloma.edu/courses/68448/assignments/928043)	:59pm
		K)
	Week 6 Readings and Lectures (Natural Selection & Antibiotic to do: 11: Resistance)	:59pm
	WK 6: Peer Teaching Group Meetings w/ Dr. Baker to do: 11:	:59pm
	WK 6: Life Application - Wendell Berry's Manifesto (The Mad Farmer Liberation Front) due by 11: (https://canvas.pointloma.edu/courses/68448/assignments/928091)	:59pm
Thu Nov 23, 2023	Extra Credit! Ted Talk: Tissue Engineering (https://canvas.pointloma.edu/courses/68448/assignments/928076)	:59pm
Mon Nov 27, 2023	Extra Credit - Infections, Stigma & Society (https://canvas.pointloma.edu/courses/68448/assignments/928074)	:59pm
	Peer Teaching: Delivery of your Topic to do: 11:	:59pm
	<u>Week 7 Readings and Lectures</u> to do: 11: <u>(COVID-19 Peer Teaching Projects)</u>	:59pm
	WK 6: Submit Final COVID-19 due by 11: Peer Teaching Presentations	:59pm



Date	Details	Due
	Module	
	(https://canvas.pointloma.edu/courses/68448/assignments/928318)	



https://canvas.pointloma.edu/courses/68448/assignments/syllabus