POINT 1902 LOMA
NAZARENE UNIVERSITY

BIO 1001 - Human Biology and Bioethics

Fall 2021

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.

PLNU Foundational Education mission statement

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 culture.

Course description

PLNU catalog description: *An exploration of assorted topics in human biology as they intersect with bioethical and sustainability issues of current interest in society. Topics include human physiology, health, reproduction, genetics, and ecology. Course examines the underlying scientific basis of specific examples and how they relate to everyday life. Course approach emphasizes the process of science, critical thinking, active learning, social relevancy, and building connections between case studies and general concepts of biology. Offered every year. Lecture 3 units, Lab 1 unit*

Note: BIO 1001L Human Biology & Bioethics Lab is a co-requisite for BIO 1001. Students enrolled in BIO 1001 must be enrolled in BIO 1001L, and vice versa. If BIO 1001 is dropped, BIO 1001L must also be dropped. Your grade for BIO 1001 and BIO 1001L will be calculated together, and the same final grade will be entered for both courses.

Lecture sessions will consist of brief 15-20 minute lectures interspersed with in-class activities to give you a chance to think about, and to apply what you are learning. This course is one of the components of the Foundational Education program at Point Loma Nazarene University, and is required for Social Work majors.

Lecture and Lab Schedule

Lecture sessions will be on Mondays, Wednesdays, & Fridays from 12:15-1:10 in Latter Hall 1
Lab Section 1 will be on Thursdays from 8:00AM – 10:30 AM in Rohr Science room 40.
Lab Section 2 will be on Thursdays 1:30PM – 4:00 PM in Rohr Science room 40.

Instructor information:

Dr. Dianne Anderson PLNU Rohr Science Bldg. Room 146 619-849-2705 DianneAnderson@pointloma.edu

Office Hours: Monday, Tuesday, and Wednesdays from 1:30-2:30 PM or by appointment

Come in person or join office hours by using this link: https://pointloma.zoom.us/j/95248189087

Required books for the course

The Story of Life: Great Discoveries in Biology (2019) by Sean B. Carroll (ISBN-13: 978-0393631562)
Origins: Christian perspectives on Creation, Evol., & Intelligent Design (2011) by D. Haarsma (ISBN -978-1-59255-573-4)
Online resource (available at no charge): https://open.umn.edu/opentextbooks/textbooks/concepts-of-biology

Important dates Last day to add: Sept. 10, 2021 Last day to drop: November 5, 2021

Course Learning Outcomes

After successful completion of this course, you will be able to:

1. Apply the following core concepts in biology to explain a variety of biological examples:
   a. Cells, organs/tissues, and ecosystems are interconnected, interacting, and regulated.
   b. Basic units of structure define the function of cells, organs/tissues, organisms and ecosystems.
   c. Energy and matter are transformed within cells, organisms and ecosystems.
   d. Information is stored, transferred, and expressed in cells, organs/tissues and organisms.
   e. The diversity of life has changed, and continues to change, as both natural selection and other types of genetic modification cause populations to evolve.
2. Use the processes and tools of scientific inquiry (both hypothesis testing and discovery science) to test biological hypotheses and to skeptically evaluate scientific information.
3. Identify major stakeholders, then determine their motivation, as well as the likely position each stakeholder would hold on a given bioethical issue.
4. Prepare and/or analyze graphs to interpret data and to draw valid conclusions to demonstrate critical thinking.*
5. Design and conduct at least one independent investigation as a demonstration of critical thinking.*
6. Recognize biology as a problem-solving science based on past and continuing experimentation, and evaluate biology's role and impact on society in terms of meeting major societal challenges.

**Selected questions from the Test of Scientific Literacy Skills (TOSLS) will be included on the final exam to assess Foundational Education Learning Outcome 1d. Critical Thinking: Students will be able to examine, critique, and synthesize information in order to arrive at reasoned conclusions.*

Grading

Assignment or assessment	Description	Points possible
4 lecture exams (100 pts. each)	Combination of multiple choice and short essay	400
Final exam (includes assessment of FELO)	Multiple choice (partly comprehensive)	125
13 Lab activities	Pre-lab questions, in-lab graphs, drawings, answers to questions, etc.	130 (10 pts each week)
Various small activities	A variety of small activities will be done alone or with a partner or a team	approx. 140 (10 pts each week)
1 lab report	Materials/methods, results, and conclusions	25
"Biology in my life" assignments	Ask and answer your own questions to see how biology is relevant to your own life	30
6 Spiritual practices/ Biology reflections	Thoughts on Shared meals, Sabbath, Silence, Solitude, Simplicity	30
	Total points	**Approx. 980**

Grades will be given on the basis of earned points as a percentage of total points possible. ALL points earned in the lecture and lab will be combined as basis for the final course grade, and this same grade will be entered for both.

A	90%	
B	80%	A "+" will be assigned to the upper 2% in each range (except
C	70%	for A+ which can't be used), and a "-" will be assigned to
D	60%	the lowest 2% in each range.
F	50%	Examples: 91% = A- 69% = D+

Students are expected to take the exams on the days scheduled unless they have an excuse cleared by me no later than the Friday preceding the exam. If there is an approved conflict you will be expected to take the exam **prior to** the

scheduled time. If something unexpected happens, we will make appropriate arrangements at that time. Makeup exams may not be the same as the original and will generally be more difficult in nature. Un-excused misses will result in a zero grade. You will have two weeks from the time exams are handed back to discuss possible corrections, after which the grade becomes permanent. Regular assignments turned in late will be graded as follows: up to 1 day late = 50% reduction, more than 1 day late = no credit. **The final exam will be taken according to the official PLNU final exam schedule and will not be changed (see Canvas for date and time).**

Tutorial Center
The PLNU Tutorial Center is available free of charge for all current, undergraduate PLNU students. It offers tutoring for most subjects, as well as for general help with paper editing, study skills, etc. The Tutorial Services is located on the south end of Bond Academic Center, next to the Academic Support Center, or available online. Tutoring is available by appointment only, and appointments must be made at least one day in advance. Appointments may be arranged in person at the Tutorial Center, over the phone at (619) 849-2593, or via email at TutorialServices@pointloma.edu.

Participation and cooperation
In an effort to create the best learning environment possible, all students should work in groups when asked to do so – whether in the lab or lecture. I may assign groups, and I will shuffle the groups several times during the semester. You may be surprised how much you can learn from one another, especially from people who you may not have chosen to work with in lab.

Phones must be muted or on vibrate during class. Only in cases of emergency should you leave class to take a phone call, unless the lab is on a break. **Texting should be extremely limited or non-existent – it really CAN wait until a break.** NO food or drinks are allowed in the lab rooms.

Attending lab is mandatory. In most cases, you will not be able to receive points for turning in assignments from a lab that you missed unless you have an excused absence, or unless you can attend the other lab section on the same day. Please make all attempts to attend the other lab section if you can't attend your own section. If you complete all 14 labs, the points for the 14th lab will count as extra credit.

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 lecture class and 1-unit lab class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework for BIO 1001. For this course, students will spend an estimated 112.5 total hours meeting the course learning outcomes for the lecture course, and 37.5 hours for the lab course. This means that course assignments and studying should take approximately 10 hours per week as detailed in the Canvas modules.

Emphasis on spiritual disciplines
In this course, you will learn about the disciplines of silence, solitude, simplicity, sharing meals and observing the Sabbath. At least once during the semester, you will share a meal with at least 2 other students in the class, and then write a reflection about it. This meal may take place on or off campus.

Use of laptops in class (if meeting in person)
I discourage use of laptops/tablets/iPads in the lecture sessions **UNLESS** you feel strongly that you take your best notes via computer or want to access the Powerpoint slides during class, and feel that it will not be distracting to yourself or others around you. I may ask you to sit in the first two rows of class, and I may call on you more often than other students during class, just to make sure that you are on task ☺. If computer use becomes a problem for some students, everyone will lose the privilege. In contrast, I will sometimes ask you to bring your laptop to lecture or lab, generally one per pair of students, so that you can look up information, work on lab reports, etc.

GENERAL PLNU POLICIES

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 for definitions of kinds of academic dishonesty and for 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 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.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, 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.

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.

BIO1001 Core Concepts

Core concepts in biology (Vision & Change, 2011) **"STEMS"**	**Sample of questions/tasks used for formative assessment (in-class activities) and summative assessment (quizzes and exams)**	**Main topics in BIO 1001**				
		Ecology	**Molecules and Cells**	**Genetics**	**Change in populations**	**Human Physiology**
S - Living **systems** at all levels are interconnected, interacting, and regulated.	Analyze a system (cell, organism, or ecosystem) to predict a possible response to a particular change. Analyze a system (cell, organism, or ecosystem) to determine how it functions in terms of its interacting components, both abiotic and biotic.	x	x		x	x
T - Information is stored, **transferred,** and expressed at the cell, organ and system level.	Explain how information is transferred from DNA to RNA to proteins. Explain how information is transferred from either cell to cell, or from one generation to the next. Trace the pathway of information flow from a stimulus to a response.		x	x	x	x
E - The diversity of life has changed and continues to change over time **(evolved and is evolving)**.	Use the theory of natural selection to explain how certain characteristics of species likely changed over time. Describe the evidence for populations changing over time.	x	x	x	x	x
M - Matter and energy are transformed within cells, organisms and ecosystems.	Trace energy in various forms as it flows through a system. Trace matter (C, N, or O) in various forms as it cycles through a system.	x	x			x
S - The **structure** of a molecule, organelle, cell, organ, or body part, etc. often relates to the function of that particular structure	Analyze a structure (molecule, organelle, cell, organ, organ system, or organism) to predict or to describe its function. Analyze the relationship of the surface area-to-volume ratio of a structure (organelle, cell, organ, or organism) to its function.		x	x	x	x

BIO1001 Core Competencies

Core competencies in science (as identified by Vision & Change, 2011 and informed by NGSS)	Sample of questions/tasks used for formative assessment (in-class activities) and summative assessment (quizzes and exams) Science Skills **(SS)** indicated below	Lab report	Lab activities & In-class activities
Ability to understand the relationship between science and society	• Analyze bioethical case studies to identify stakeholders and their motivation. • Identify ways that biological information and techniques can address major societal challenges. • Given a source of information/conclusions, determine if the source is credible. **(SS #1)**		x
Ability to use quantitative reasoning	• Given a graph or table, state a valid conclusion. **(SS #2)** • Given a set of data, create an appropriate **graph, table**, or model to summarize the data. **(SS #3)**	x	x
Ability to develop and/or use modeling and simulation	• Given a set of data, create an appropriate graph, table, or **model** to summarize the data. **(SS #3)** • Given a hypothesis, use a simulation to test it. **(SS #5)**		x
Ability to apply the processes of science	• Given an experimental design, carry out the experiment to collect the data. **(SS #4)** • Given a hypothesis, design an experiment to test it. **(SS #5)** • Make observations, then generate a testable hypothesis. **(SS #6)**	x	x
Ability to tap into the interdisciplinary nature of science	• Use information and processes from chemistry, statistics, and various sub-disciplines to solve problems in biology.		x

BIO 1001 Fall 2021 Schedule Overview (Subject to change)

The detailed content of the course schedule and assignments will be posted in Canvas.

Week	Date	Topic(s)
Week 1	Aug. 31 (Tues.)	Intro to course (main concepts, bioethics, & spiritual practices) Nature of Science & Process of Science Skills intro
2	Sept. 13	No class on Monday (Labor Day) Ecology (populations, communities)
3	Sept. 20	Ecology (ecosystems, biomes, extinction)
4	Sept. 27	**Ecology exam** Cells & Molecules (biochemistry, cell structures, cellular transport)
5	Oct. 4	Cells & Molecules (enzymes, cellular respiration, photosynthesis)
6	Oct. 11	**Cells & Molecules exam** Genetics (DNA synthesis, genetic variation, mitosis, meiosis)
7	Oct. 18	Genetics (classical genetics, molecular genetics) No class on Friday (Fall Break)
8	Oct. 25	Genetics (molecular genetics, biotechnology, genetic analysis)
9	Nov. 1	**Genetics exam** Populations change
10	Nov. 8	Populations change
11	Nov. 15	Populations change **Populations change exam** Human physiology
12	Nov. 22	Human physiology
13	Nov. 29	Human Physiology No class Wednesday-Friday (Thanksgiving Break)
14	Dec. 6	Human Physiology
15	Dec. 13	**Final exam (10:30-1:00 PM Wednesday, Dec. 15, 2021)** **Make all travel plans with this in mind!**