BIO 1001 - Human Biology and Bioethics

Spring 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 General Education Program at Point Loma Nazarene University, and is required for Social Work majors.

Lecture and Lab Schedule

Lecture sessions will be held remotely 11:00am-12:00pm on Mondays and Wednesdays; Fridays will be used for activities, projects and other assignments due Saturdays
Lab Section 1 will be held in-person on Mondays from 2:45PM – 5:15PM
Lab Section 2 will be held in-person on Mondays from 5:30PM- 8PM

Instructor information:

Professor Brikia Cephus bcephus@pointloma.edu
Zoom Office Hours: Via appointments using the link: https://pointloma.zoom.us/j/8867440601

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 resources (available at no charge)
Crash course biology video collection: https://www.pbslearningmedia.org/collection/crash-course-biology/
Open Textbook Library Concepts of Biology textbook:
https://open.umn.edu/opentextbooks/textbooks/concepts-of-biology

Important dates Last day to add: March 12, 2021 Last day to drop:

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. Living systems at all levels are interconnected, interacting, and regulated.
   b. Basic units of structure define the function of living organisms and their components at all levels.
   c. Energy and matter are transformed within cells, organisms and ecosystems.
   d. Information is stored, transferred, and expressed at the cell, organ and system level.
   e. The diversity of life has changed and continues to change over time (evolved and is evolving) by processes of the environment acting on variation, as well as other types of genetic change.
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
Innovation in biology project	Independent project showing innovation in biology that addresses a specific problem	25
6 Spiritual practices/ Biology reflections	Thoughts on Shared meals, Sabbath, Silence, Solitude, Simplicity	30
	Total points	**Approx. 975**

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 detailed schedule 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.

If classes are held in person, 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 and you will not be able to make up labs that are missed, unless you can attend the other lab section on the same day. In most cases, you will not be able to receive points for turning in assignments from a lab that you missed. In some cases, I will approve an excuse, and you will be able to earn points for a missed lab if you turn in the lab assignment on time. 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

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.

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

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 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 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

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* information. Additionally, students are required to have headphone speakers compatible with their computer available to use. If a student is in need of technological resources please contact student-tech-request@pointloma.edu.

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

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 - Basic units of **structure** define the function of living organisms and their components at all levels.	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	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**	**Biology innovation project**
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	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	X

BIO 1001 Fall 2020 Schedule Overview

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

Week	Topic(s)
Week 1	Intro to course (main concepts, bioethics, & spiritual practices) Nature of Science & Process of Science Skills intro
2	Ecology (populations, communities)
3	Ecology (ecosystems, biomes, extinction)
4	**Ecology exam** (during lab) & Cells & Molecules (biochemistry, cell structures, cellular transport)
5	Cells & Molecules (enzymes, cellular respiration, photosynthesis)
6	**Cells & Molecules exam** (during lab) & Genetics (DNA synthesis, genetic variation, mitosis, meiosis)
7	Genetics (classical genetics, molecular genetics)
8	Genetics (molecular genetics, biotechnology, genetic analysis)
9	**Genetics exam** (during lab) & Populations change (natural selection, evidence for change)
10	Populations change (other mechanism of change, biodiversity)
11	**Populations change exam** (during lab) & Human physiology (homeostasis, digestive system, respiratory system)
12	Human physiology (cardiovascular system, urinary system, nervous system)
13	Human Physiology (metabolism, immune system)
14	REVIEW Only Monday class
15	**Final exam (10:30-1:00PM Monday)**