

# BIO 1005 SYLLABUS

## Ecology & Conservation Biology

### SPRING 2023



#### **Catalog Course Description: BIO 1005 / 1005L - Ecology and Conservation (4 units)**

This GE course is a wide-ranging exploration of major topics in ecological science relating to current issues in conservation biology. Drawing from academic and applied fields, the course examines major concepts in conservation biology and how they impact society, public policy, wise management of natural resources, and ethical choices encountered in everyday life. Focus topics include biodiversity, habitat destruction, exotic species introductions, human harvesting, protected areas, and future prospects. Course approach emphasizes the process of science, critical thinking, active learning, social relevancy, and building connections between case studies and general concepts. An inquiry-based laboratory is a co-requisite.

**Instructor:** Dr. Mike Mooring  
Rohr Science Room 128  
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E-mail: [mmooring@pointloma.edu](mailto:mmooring@pointloma.edu)

*Office hours:*  
Make an appointment (office or Zoom)

**Teaching Assistants:** *Lab Section 1:* Maiah Rivas – [mrivas0020@pointloma.edu](mailto:mrivas0020@pointloma.edu)  
*Lab Section 2:* Ashley Velázquez – [avelazqu0021@pointloma.edu](mailto:avelazqu0021@pointloma.edu)

**Lecture:** Mon-Wed-Fri from 8:30-9:25 AM in **Latter 02** (lower level)

**Lab:** *Section 1:* Monday 2:45-5:45 PM in **Sator 108**  
*Section 2:* Wednesday 2:45-5:45 PM in **Sator 108**

**Equipment:** [iClicker2 remote](#) for class participation and quizzes

**Required Textbook:** *buy used copies from bookstore or online*

[Environmental Science: toward a sustainable future, 12<sup>th</sup> edition](#), by Richard T. Wright and Dorothy F. Boorse, Pearson, 2013. ISBN-10: 0133102785, ISBN-13: 978-0133102789.

#### **Student Learning Outcomes:**

Upon completion of the course, each student will be able to:

- describe how interactions between organisms and their environment influence populations, communities, and ecosystems
- explain strategies for conserving biodiversity and protecting or restoring ecosystems
- articulate and defend a position on environmental stewardship drawing on both biological principles and a Biblical worldview
- design and conduct investigations applying the processes and tools of scientific inquiry (both hypothesis testing and discovery science) to test biological hypotheses
- prepare and analyze graphs drawing valid scientific conclusions

**Foundational Explorations Learning Outcomes (FELO):** All FE courses are required to assess a FELO. In this course, we will assess FELO 1D: **Critical Thinking** – “Students will be able to examine, critique and synthesize information in order to arrive at reasoned conclusions.” This FELO will be assessed by means of a few questions embedded in the final exam.

**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 15 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.

**Three scriptural anchors:**

*God spoke: "Let us make human beings in our image, make them reflecting our nature so they can be responsible for the fish in the sea, the birds in the air, the cattle, and, yes, Earth itself, and every animal that moves on the face of Earth." God created human beings; he created them godlike, reflecting God's nature. He created them male and female. God blessed them: "Prosper! Reproduce! Fill Earth! Take charge! Be responsible for fish in the sea and birds in the air, for every living thing that moves on the face of Earth." Genesis 1: 26-28 (The Message)*

*The LORD God put the man in the Garden of Eden to take care of it and to look after it. Genesis 2:15 (CEV)*

*Jesus replied, “You must love the LORD your God with all your heart, all your soul, and all your mind.’ This is the first and greatest commandment. A second is equally important: ‘Love your neighbor as yourself.’ The entire law and all the demands of the prophets are based on these two commandments.” Matthew 22: 37-40 (NLT)*

**Central Theme:**

“What will it take to move our civilization in the direction of a long-term sustainable relationship with the natural world?”

**Course Goal:**

Ecology is the study of the interrelationships among living and non-living things in the environment, in other words, how everything is linked to everything else. Conservation biology is the practical science of understanding biodiversity and saving species. One of my primary goals for you is that you will be able to make conceptual linkages among living things and the environment and how these in turn impact biodiversity. My hope is that that this course will help you think critically and work for a better world.

### **Course Design:**

We will meet 3 times a week for a 55-min lecture period in Lattar 2, and once a week for a 3-hour mandatory lab period in Sator 108. Every week in class we will do one or more iClicker quizzes on the reading and guided questions from the textbook, in addition to other clicker activities. The material covered in the labs will typically be linked to the current lecture topic but with a different application. Your understanding of the concepts and connections will be assessed through 3 exams (2 midterms and a final), lab assignments, and clicker quizzes.

### **Readings and Lab Assignments:**

You will be responsible for completing the assigned readings from the textbook in a timely manner. Reading questions must be written up and answered individually, by each student. No collaborations on the readings! About twice a week I will assign specific chapter sections along with guided questions. You will submit your answers to the guided questions through Canvas 'Assignments' and they will be graded online. A clicker quiz will be given in class on the due date to make sure you are keeping up. Lab assignments will be submitted online prior to the next lab. An exam study guide will be available to help you prepare for each exam.

### **Clicker Polling:**

I teach by using a combination of lecture and small group activities. To enable participation by everyone in a large class, I require you to have an [iClicker 2 remote](#). The clicker quizzes are used to encourage class participation (being engaged in the class activities) and performance (getting the right answer). The exams will use your iClicker remote in the 'self-paced mode'. If your clicker is not already registered, please [register your remote](#) at the iClicker website so that your participation is recorded.

### **Late Assignments:**

The following penalties will apply for all assignments submitted after the due date. The intent of late penalties is to (1) encourage you to turn in your work on time, and (2) to be fair to those who submit their work on time. However, if you have a legitimate reason for being unable to complete an assignment on time, please communicate that directly to the grader by including a note in the text box when you submit.

- Readings (worth 5 pts): 1 point deducted for each day late (no points after 5 days)
- Labs (usually 20 pts): 2 points deducted for each day late (no points after 10 days)

### **Attendance and Punctuality:**

Regular and punctual attendance is important for optimal achievement and is a requirement for this course. Attendance will be taken with a sign-in list, so it is important for you to be sure to sign in for every class meeting you attend. You are permitted **five (5)** absences (10% of class time) without penalty. Every unexcused absence in excess of 5 will incur a deduction from your attendance participation points. Late arrivals in class are disruptive, therefore please arrive punctually.

### **Technology Etiquette:**

It is obligatory to use your electronic devices responsibly and with respect for others. In this class, it is simply bad manners to be wired to your smartphone or other device instead of being engaged with class activities. Texting and similar activities are a distraction to your fellow students and to me. To ensure the best learning environment possible, **classroom policy is that all electronic devices are turned off and put away out of sight when class is in session.** Stay focused and do not get distracted!

## **Academic Honesty:**

Academic dishonesty is any type of cheating, including plagiarism, fabrication, deception, or impersonation. Plagiarism is the act of presenting information, ideas, or concepts as one's own when in reality they are the result of another person's creativity and effort. With the exception of group assignments with your designated partner, all assignments must be based on your own work. Each assignment must be written in your own words, and no electronic files should be exchanged. Another form of plagiarizing is to copy and paste answers from the reading into your answer, which involves using someone else's words as if they were your own. Much of the learning process involves articulating the answer in your own words, thus bypassing this step will result in an inadequate understanding of the material and will decrease your success on exams or quizzes.

## **Laptops:**

Recent studies have shown that we are currently experiencing an epidemic of 'digital distraction' caused by multi-tasking – moving quickly between tasks on electronic devices in which only partial attention is given to each task. In the classroom setting, studies reveal that the use of laptops for non-course related tasks (e.g., checking emails, social media, browsing) distracts attention from learning and results in reduced academic performance and lowered grades. The reality is that you cannot fully learn new information or master new concepts when distracted by multi-tasking. The evidence indicates that even classmates that see your screen are distracted and their performance reduced. Studies have also shown that students learn better when they have to take notes by hand because they must summarize information in their own words. **I recommend that you do not use your laptops at all during lecture**, and please do not use your laptop for anything incompatible with giving the class your undivided attention. Note that you will be using your laptops in lab sections.

## **What your grade will be based on:**

*\*Assignment points are approximate and may be adjusted at instructor's discretion*

Attendance Participation	50 pts
Reading questions (22 @ 5 pts)	125 pts
Clicker quiz questions	150 pts
Lab assignments (15 @ 10-20 pts)	255 pts
Team class activities	75 pts
Midterm exams (2 @ 100 pts)	200 pts
Final exam	<u>100 pts</u>
<b>Total</b>	<b>955 pts</b>

### **Letter Grades:**

A	90%	C	70%
A-	88%	C-	68%
B+	86%	D+	66%
B	80%	D	60%
B-	78%	D-	58%
C+	76%	F	< 58%

## PLNU INSTITUTIONAL POLICIES

### **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.

**Foundational Explorations (formerly GE) 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 culture.

**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 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](mailto: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, which 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 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.

**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](mailto: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.

**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 Final Examination Policy:** Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted in this syllabus on the following pages. No requests for early examinations or alternative days will be approved unless you have 3 final exams scheduled on the same day or another compelling reason.



Unless someone like you  
Cares a whole awful lot,  
Nothing is going to get better.  
It's not.

– Dr. Seuss, The Lorax

## BIO 1005 LECTURE SCHEDULE - SPRING 2023

	DATE	TOPIC	Wright & Boorse 12e Reading
INTRODUCTION	Jan 10-13	A Sustainable Future	(1) 1.3
	<b>Jan 16</b>	<b>MARTIN LUTHER KING DAY</b>	
ECOSYSTEMS	Jan 18	Trophic Relationships in Ecosystems	(2) 3.1, 5.1
	Jan 20-23	Energy & Matter in Ecosystems	(3) 3.4-3.5, 5.2
POPULATIONS	Jan 25-27	Population Dynamics in the Wild	(4) 4.1-4.2
COMMUNITIES	Jan 30	Community Interactions	(5) 4.3
	Feb 1-3	Biomes, Disturbance, Succession	(6) 5.3-5.4
HUMANS	Feb 6	Human Population Growth	(7) 8.1-8.4
	Feb 8	Demographic Transition	(8) 9.1
WATER	Feb 10	Hydrologic Cycle	(9) 10.1-10.2
	Feb 13-15	Water Shortages	(10) 10.3-10.4
<b>► EXAM 1 →</b>	<b>Feb 13   15</b>	<i>During lab sections in Sator 108</i>	
	<b>Feb 17-24</b>	<b>Dr. M in Costa Rica   Lab meets in person, lecture on Canvas</b>	
CLIMATE	Feb 17-24	Climate Change   <i>Canvas lectures</i>	(11) 18.2-18.3
SOIL	Mar 27-Mar 3	Soil Formation and Soil Loss	(12) 11.1-11.3
	<b>Mar 6-10</b>	<b>SPRING BREAK</b>	
AGRICULTURE	Mar 13-15	Production and Distribution of Food	(13) 12.1-12.5
	Mar 17-20	Pests and Pest Control	(14) 13.1-13.4
BIODIVERSITY	Mar 22-24	Biodiversity	(15) 6.1-6.4
	Mar 27	Tragedy of the Commons	(16) 7.2-7.3
POLLUTION	Mar 29-31	Water Pollution and Dead Zones	(17) 20.1-20.3
<b>► EXAM 2 →</b>	<b>Mar 27   29</b>	<i>During lab sections in Sator 108</i>	
ENERGY	Apr 3-5	Fossil Fuels and Nuclear Energy	(18) 14.2-14.5
	<b>Apr 7-10</b>	<b>EASTER RECESS</b>	
	Apr 12-14	Renewable Energy	(19) 16.1-16.6
POLLUTION	Apr 17	Solid Waste: Landfills and Recycling	(20) 21.1-21.3
	Apr 19	Hazardous Chemicals	(21) 22.1-22.5
	Apr 21	Sustainable Business & Natural Capital	(22) 2.1-2.2
ECONOMICS	Apr 24-28	Sustainable Communities & Lifestyles	(22) 23.1-23.3
<b>► FINAL EXAM</b>	<b>May 1</b>	<b>MONDAY 7:30-10:00 AM</b>	

## LAB SCHEDULE – SPRING 2023

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Section 1: Monday 2:45-5:45 PM – *Teaching Assistant* – Maiah Rivas

Section 2: Wednesday 2:45-5:45 PM – *Teaching Assistant* – Ashley Velazquez

**Bring your laptop computer to all indoor labs | ▲ indicates a field lab**

DATE (MON   WED)	TOPIC	LAB ACTIVITY
Jan 10   11	Primary Producers	(1) <b>Classic Plant Experiments</b>
<b>Jan 16   18</b>	<b>NO LABS – MLK Day</b>	
Jan 23   25	Food Webs	(2) <b>Ecosphere Project; Trophic Relations</b>
Jan 30   Feb 1	Ecosystem Services	(3) <b>Millennium Ecosystem Assessment</b>
Feb 6   8	Biodiversity	(4) <b>▲ Sunset Cliffs Tidepools</b> <ul style="list-style-type: none"> <li>○ Mon 2/6 – Low tide @ 3:58 PM -0.6 ft.</li> <li>○ Tues 2/7 – Low tide @ 4:22 PM -0.4 ft. <i>BACKUP DAY</i></li> <li>○ Wed 2/8 – Low tide @ 4:45 PM -0.1 ft.</li> </ul>
<b>Feb 13   15</b>	<b>▶ Exam 1</b>	<b>Section 2 will take the exam on Canvas with Honorlock</b>
<b>Feb 20   22</b>	<b>Climate Change</b>	<b>(5) Meadow Warming Experiment; Marmots and Robins DR. MOORING IN COSTA RICA</b>
Feb 27   Mar 1	Protected Areas	(6) <b>Designing Biodiversity Reserves</b>
<b>Mar 6   8</b>	<b>NO LABS – Spring Break</b>	
Mar 13   15	Plant Biodiversity	(7) <b>▲ Flex Canyon Native Plants</b>
Mar 20   22	Ecosystem Invaders	(8) <b>Zebra Mussel Invasion</b>
<b>Mar 27   29</b>	<b>▶ Exam 2</b>	<b>Extra Credit Film @ 2:45   Exam @ 3:45</b>
Apr 3   5	Eutrophication	(9) <b>Dead Zone and Kugaruk River</b>
<b>Apr 10   12</b>	<b>NO LABS – Easter Recess</b>	
Apr 17   19	Avian Biodiversity	(10) <b>▲ Famosa Slough Birds</b>
Apr 24   26	Protected Areas	(11) <b>Wildlife Crossings in Costa Rica</b>
<b>▶ FINAL EXAM</b>	<b>May 1 MONDAY 7:30-10:00 AM</b>	