POINT 1902 LOMA
NAZARENE UNIVERSITY

Biology Department	Fall 2026
BIO 2012-1 and BIO 2012L -1 Organismal Biology (4 units)	Dr. Andrew Nosal, Dr. Dianne Anderson & Prof. Jennifer Niethammer

You alone are the LORD. You made the heavens, even the highest heavens, and all their starry host, the earth and all that is on it, the seas and all that is in them. You give life to everything, and the multitudes of heaven worship you.
Nehemiah 9:6

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.

Course description

Principles of animal and plant structure, function, and diversity. Lecture and lab must be taken together. Offered every year. Where does this course fit in? It's one of three required courses (Bio 2010, 2011, and 2012) that form the lower division biology sequence for the Biology, Biology-Chemistry, and Environmental Science majors, and is required for the Organismal Biology minor. It also serves as preparation for upper-division three organismal biology courses: Sustainable Agriculture, Ethnobotany, and Advanced Human Physiology.

Course learning outcomes:

1. Students will explain the structure and function of multicellular organisms in terms of the adaptation of common body plans to diverse environmental challenges.
2. Students will analyze the common and divergent ways that animals, plants, protists, fungi and bacteria solve the physiological problems of maintaining homeostasis, detecting/responding to stimuli, obtaining energy/ nutrients, transporting materials, removing wastes, growing/developing, and reproducing.
3. Students will relate the properties of macromolecules, and the cells containing them, to the function of tissues, organs, and organ systems.
4. Students explain how an understanding of how animals, plants, fungi and protists can inspire sustainable solutions to societal problems including climate change, medical care, clean food/water and energy.

Class meeting places and times

Lecture: MWF 1:30-2:25 PM meets in Latter Hall 1
Labs: Wednesdays 2:45-5:45 PM in Rohr Science 40

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 (3 units lecture and 1 unit lab) delivered over 15 weeks. It is anticipated that you will spend a minimum of 37.5 participation hours per credit hour on your coursework, so for this course, that means approximately 150 total hours during the semester. In addition to lab and lecture time, you are expected to spend approximately 4 hours studying course material, completing assignments, etc. **each week**.

Instructors and instructor availability - This course will be team-taught by Dr. Nosal & Dr. Anderson will teach the lecture course, and Dr. Anderson and Prof. Niethammer will teach the lab.

Dianne L. Anderson, Ph.D. dianneanderson@pointloma.edu
Phone: (619) 849-2705 Office hours in RS146: Mondays 2:30-4:00, Thursdays 1:00-3:00 PM or by appt.

Andrew P. Nosal, Ph.D. anosal@pointloma.edu
Phone: (619) 849-2656 Office hours in RS140: Mondays & Fridays 9:00-10:00 am or by appt.

Prof. Jennifer Niethammer jnietham@pointloma.edu
Office hours by zoom appointment

Required materials

1. Urry, Cain, Wasserman, & Minorsky (2019). ***Campbell Biology in Focus*** (Third Edition. Pearson (ISBN 9780134710679). If you have a different, but similar textbook, you can use it but will need to look up topics in the index.
2. Chamovitz, Daniel (2017). ***What a Plant Knows: A Field Guide to the Senses*****.** Scientific American (Referred to as "WAPK" in the schedule)
3. Catania, Kenneth. (2020). ***Great Adaptations: Star-Nosed Moles, Electric Eels, and Other Tales of Evolution's Mysteries Solved.*** Princeton University Press
4. **iClicker –** Available in the bookstore if you don't already have one. (needed for lecture sessions)

This course is part of our course material delivery program, **LomaBooks**. The bookstore will provide each student with a convenient package containing all required physical materials; all digitally delivered materials will be integrated into Canvas. You should have received an email from the bookstore confirming the list of materials that will be provided for each of your courses and asking you to select how you would like to receive any printed components (in-store pick up or home delivery). If you have not done so already, please confirm your fulfillment preference so the bookstore can prepare your **LomaBooks** materials.

Clicker registration

The iClicker remote is available to buy or rent at the bookstore or online. You need to register your clicker online by going to this web address: https://www.iclicker.com/remote-registration-form-for-classic

How we've organized this course and how you can succeed…

Lecture class is designed to introduce you to essential concepts illustrated by specific examples, and to equip you to apply your understanding to scientific problems. The associated reading comes from a portion of a chapter or chapters of Brooker, or from other assigned reading. Learning outcomes for each topic are available on Canvas; these learning outcomes are the basis for the lecture exams. Powerpoint slides for each lecture will be posted on Canvas before the start of each lecture. It is strongly recommended that you go through the learning outcomes and slides before lecture so that you can be prepared.

The lab exercises are an essential component of the course. Each lab will have a 5 pt. quiz at the beginning of lab to assess understanding of the previous week's lab. Most of the labs will be completed using lab documents on Canvas, so bring your computer to lab.

Help with studying and keeping up with the course

We recognize that students come from a great variety of academic backgrounds, and that some of you may not have yet developed the appropriate study skills to do as well as you would like in college. Everyone needs help from time to time. There are many places to gain assistance or study skills - your peers, the professors, or PLNU's

Tutorial Services Center. The center is located on the first floor of Ryan Library. A list of the Center's services can be found here: http://www.pointloma.edu/experience/offices/student-services/tutorial-services/services

Attendance
Poor attendance tends to correlate with low exam scores. Please communicate with us regarding any planned absences. At 5 lecture (or 2 lab) absences, we must contact the Vice-Provost for Academic Administration for possible de-enrollment. At 10 lecture (or 3 lab) absences, you will be dropped from the course unless there is an exception granted by the administration.

Important date: Last day to add or drop the course is Sept. 11, 2026

In-class expectations
Computer activity in class must be course related. Misuse in this regard could lead us to ban all personal computers and phones in class. We will endeavor to start lecture and lab classes at the stated times. Please do the same! Extend the same type of courteous, considerate, respectful, and professional behavior towards each other and towards us as we will extend to you. You are expected to arrive in lectures and labs on time and prepared to be engaged with in- class activities (i.e., not distracted by cell phones or asleep), listening respectfully to others, answering questions, and asking questions. All students are expected to contribute their fair share to group work.

Assignments and grading
All lecture and lab assignments in this course are intentionally designed to help you to achieve the learning outcomes and are scheduled to best connect with what we do in the actual lab and lecture. To promote this, all assignments are to be submitted/turned in before the time/day they are due. This means that late submissions (starting immediately after the due time) will lose 25% credit for the first 24 hours, and this pattern of decreasing by 25% each day will continue until it is too late to submit (no credit after 3 days). This structure is intended to help you keep up and to learn as much as possible. Incompletes will only be assigned in extremely unusual circumstances. Your grades for lecture and lab will be combined, and the same grade will be given to both. Only lab assignments and quizzes associated with excused absences (e.g., illness, PLNU athletic event, etc.) can be made up. Otherwise, students missing a lab for an unexcused reason will receive zero points for these. At the end of the semester the one lowest lab assignment score (including a zero for an unexcused absence) will be dropped.

Assignment/Exam	**Points possible**
3 exams @ 100 points each	300 points
Final exam (partly comprehensive)	125 points
11 lab quizzes @ 5 points each	55 points
6 open book reading quizzes @ 10 points each	60 points
15 labs @ 10 points each (your lowest lab score will be dropped)	140 points
Miscellaneous small assignments	Approx. 50 points
Attendance, participation, & professional conduct score	20 points
TOTAL	**Approx. 750 points**

Attendance, participation, & professional conduct (APPC) score

Lecture and laboratory attendance is mandatory. PLNU is a community where students practice becoming responsible, respectful, and engaged adults. Part of this growth involves showing up prepared for class, contributing positively, and working well with others. The APPC score reflects your engagement and professional behavior in this course.

- Default Score: points.
- Attendance: One point may be deducted for every two lecture absences and for every lab absence.
- Participation & Professional Conduct: Points may also be deducted for behaviors that disrupt learning, such as talking while the instructor is speaking, using a laptop or phone for non-class purposes, or not contributing appropriately to group work.

We encourage you to be fully present in class—mind, body, and spirit—and to make your presence a positive contribution to the learning environment.

Grade calculation

A 92-100%	A- 90-91%	B+ 88-89%	B 82-87%	B- 80-81%	C+ 78-79%
C 72-77%	C- 70-71%	D+ 68-69%	D 62-67%	D- 60-61%	F 59% or lower

Exams

The course has three lecture exams as well as the final exam. The first three exams consist of multiple-choice, matching, and short-answer questions. The final exam (all multiple choice) will consist of 60% items related to the last portion of the course, as well as 40% items related to the main ideas/themes of the overall course.

Final Exam policy: No requests for early exams will be granted, so plan accordingly. Successful completion of this class requires taking the final examination on its scheduled day (see course schedule in this document). The PLNU final examination schedule is posted on the Traditional Undergraduate Records: Final Exam Schedules site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are allowed to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

Schedule BIO 2012 overview FALL 2026 schedule (subject to change)

See assignment details and due dates on Canvas

Color Legend: GREEN – Dr. Anderson, BLUE – Dr. Nosal, Prof. Niethammer – Gold, ORANGE – exam day

Week/ Date	Monday lecture	Wednesday lecture	Wednesday lab	Friday lecture
WK #1 Aug. 31	Intro to Org. Biol (challenges & solutions) Prokayotes vs. Eukaryotes	Intro to Plant Diversity	Lab #1 Eukaryotic Cells	Plant Diversity I – Mosses & Ferns
WK #2 Sep. 7	**No Lecture – LABOR DAY**	Plant Diversity II – Non-flowering seed plants	**[lecture during lab]** Plant Diversity III – Flowering seed plants	Intro to Animal Diversity
WK #3 Sep. 14	Animal Diversity Part I	Animal Diversity II	Lab #2 Ferns, Mosses & Gymnosperms	Animal Diversity III – Chordata
WK #4 Sep. 21	Fungal and Protist Diversity	Plant Reproduction I	Lab #3 Animal Diversity	**Exam #1**
WK #5 Sep. 28	Plant Reproduction II	Plant Development I	Lab #4 Flower, Fruit, and Seeds	Plant Development **WAPK Quiz #1**
WK #6 Oct. 5	Animal Reproduction & Development I	Animal Reproduction & Development II	Lab #5 Roots, Stems & Wood	Plant Nutrition – Soil minerals **WAPK Quiz #2** **(Lab #6 Tidepool trip: Saturday, Oct. 10, 3-5PM)**
WK #7 Oct. 12	Plant & Algal Nutrition – Photosynthesis I	Plant & Algal Nutrition – Photosynthesis II	Lab #7 Invertebrate Dissection	Animal Nutrition I **WAPK Quiz #3**
WK #8 Oct. 19	Animal Nutrition II	**Exam #2**	Lab #8 Tonicity & Osmolarity	**No Lecture – FALL BREAK**
WK #9 Oct. 26	Transport in Plants I	Transport in Plants II	Lab #9 Leaves	Transport in Animals I **GA Quiz #1**
WK #10 Nov. 2	Transport in Animals II	Transport in Animals III	Lab #10 San Diego Zoo Field (plants)	Homeostasis in Animals I **GA Quiz #2**
WK #11 Nov. 9	Homeostasis in Animals II	Waste Removal in Animals I	Lab #11 Vert. Dissection I (perch and frog)	Waste Removal in Animals II **GA Quiz #3**
WK #12 Nov. 16	Waste Removal in Plants	**Exam #3**	Lab #12 Vert. Dissection II (fetal pig external)	Stimulus Detection & Response in Plants I
WK #13 Nov. 23	Stimulus Detection & Response in Plants II	**No Lecture – THANKGIVING**	**No Lab – THANKGIVING**	**No Lecture – THANKGIVING**
WK #14 Nov. 30	Stimulus Detection & Response in Animals I	Stimulus Detection & Response in Animals II	Lab #13 Vert. Dissection III (fetal pig internal)	Stimulus Detection & Response in Animals III
WK #15 Dec. 7	Animal Detection & Response to Stimuli IV	How do fungi function?	Lab #14 San Diego Zoo field trip (animals)	How do protists function? Semester Review
Exam Week Dec. 14	**Monday, Dec. 14 Final Exam 1:30 – 4:00 pm**			

GENERAL PLNU POLICIES

Content Warning
We acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive various types of information. In BIO212/BIO2012L, all the class content, including that which may be intellectually or emotionally challenging, has been intentionally curated to achieve the learning goals for this course. The decision to include such material is not taken lightly. These topics include issues related to evolution and phylogenetics. If you encounter a topic that is intellectually challenging for you, it can manifest in feelings of discomfort and upset. In response, I encourage you to come talk to one of us or your friends or family about it. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of biology, and we will support you throughout your learning in this course.

General Course Concerns
If you have a concern related to the content or structure of this course, please bring your concern(s) to me (the instructor) in a timely manner, so that we have the opportunity to discuss your thoughts and work together toward a solution.

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 you have questions, a desire to meet with the chaplain or have prayer requests you can contact your professor or the Office of Spiritual Life and Formation.

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 Recording Notification
In order to enhance the learning experience, please be advised that this course may be recorded by the professor for educational purposes, and access to these recordings will be limited to enrolled students and authorized personnel.
Note that all recordings are subject to copyright protection. Any unauthorized distribution or publication of these recordings without written approval from the University (refer to the Dean) is strictly prohibited.

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. For all student appeals, faculty and students should follow the procedures outlined in the University Catalog. Please consult the Academic Honesty Policy in the University Catalog for definitions of kinds of academic dishonesty and for further policy information.

PLNU Academic Behavior Policy
Both faculty and students at Point Loma Nazarene University have the right to expect a safe and ordered environment for learning. Students are expected to take the initiative to learn and conduct themselves in a mature and civil manner in the classroom environment. Any student behavior that is disruptive or threatening is a serious affront to Point Loma Nazarene University as a learning community. Students who fail to adhere to these

behavioral standards may be subject to disciplinary action, including removal from class or further university sanctions. For a full definition of disruptive behavior, response procedures, and the appeal process, please consult the Academic Behavior Policy in the University Catalog.

PLNU Artificial Intelligence (AI) Policy

The use of Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro, GrammarlyGo, Perplexity, etc.) is prohibited in this course for any aspect of your work, including idea generation, drafting, editing, or final submissions. This course is designed to assess your independent critical thinking, writing, and research skills without the assistance of AI technologies. Any reliance on AI tools in this course is subject to an academic honesty violation. You will be notified if there are any exceptions or policy changes.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center, by email or phone at 619-849-2533. Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines approved accommodations. Professors are able to view a student's approved accommodations through Accommodate.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their approved accommodations in that particular course. Accommodations are not retroactive; as such, clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

Students who need accommodations for a disability-related need should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. In accordance with ADA, accommodations cannot constitute a fundamental alteration to course outcomes; therefore, planning ahead is vital in establishing appropriate accommodations for equal access to this course. It is the student's responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC eligibility process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any accommodations.

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. If you (or someone you know) has experienced other forms of discrimination, you can find more information on reporting and resources via the Nondiscrimination and Anti-harassment Policy.

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. 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 or consult the list of campus pastors. If you (or someone you know) has experienced other forms of discrimination or bias, you can find more information on reporting and resources via the Nondiscrimination and Anti-harassment Policy.

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 withdrawal date or, after that date, receive an "F" grade.

Loma Writing Center
Getting feedback from the Loma Writing Center while you're in the process of working on an assignment is a great way to improve the quality of your writing and develop as a writer. You are encouraged to talk with a trained writing consultant about getting started on an assignment, organizing your ideas, finding and citing sources, revising, editing for grammar, and polishing final drafts, and more.
Walk-ins are welcome, but we recommend making an appointment in advance. For information about how to make in-person or online appointments, see Loma Writing Center webpage or visit the Loma Writer Center on the first floor of the Ryan Library, room 221.

- Appointment Calendar
- Website
- Email