

Biology Department	Spring 2026
BIO 2012-1 and BIO 2012 L -1,2,3 Organismal Biology (4 units)	Dr. Andrew Nosal, Dr. Dianne Anderson & Professor 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, and fungi 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 12:15 – 1:10 PM meets in Latter Hall 1

Labs: Sec. 1 (Mon. 2:45-5:45 PM), Sec. 2 (Tues. 8:00-11:00 AM), and Sec. 3 (Tues. 1:30-4:30 PM) in Rohr Sci. 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 (lecture & lab), Dr. Anderson (lecture & lab) who will lead lecture and lab on various days depending on the topic, except for Lab Section 3 that will be taught by Prof. Niethammer.

Dianne L. Anderson, Ph.D. dianneanderson@pointloma.edu
Phone: (619) 849-2705 Office hours in RS146: Tuesdays 11:00-12:30, Wednesdays 1:30-2:30, Thursdays 3:00-4:30 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: Tuesdays before lab 1:00-1:30 or 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 materials.*

*For more information about **LomaBooks**, please go: [HERE](#)*

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. It’s often a good idea to bring your textbook (Brooker) to lab. 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 January 23, 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 to 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.

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: 20/20 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.

Assignments and grading

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. 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
Misc. in-class activities and small assignments	Approx. 50 points
Bioinspiration assignment	10 points
Attendance, participation, & professional conduct score	20 points
TOTAL	Approx. 760 points

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 SPRING 2026 schedule (subject to change)

See assignment details and due dates on Canvas

Color Legend: **GREEN** – Dr. Anderson, **BLUE** – Dr. Nosal, **ORANGE** – exam day

Week/ Date	Monday lecture	Monday/Tuesday labs	Wednesday lecture	Friday lecture
WK #1 Jan. 12	Intro to Org. Biol (challenges & solutions)	Lab #1 Eukaryotic Cells	Intro to Plant Diversity	Plant Diversity I – Mosses & Ferns
WK #2 Jan. 19	No class – MLK day	No labs	Plant Diversity II – Non-flowering seed plants	Plant Diversity III – Flowering seed plants
WK #3 Jan. 26	Intro to Animal Diversity	Lab #2 Ferns, Mosses & Gymnosperms	Animal Diversity Part I (recorded lecture)	Animal Diversity II
WK #4 Feb. 2	Animal Diversity III – Chordata	Lab #3 Animal Diversity	Fungal and Protist Diversity	Exam #1
WK #5 Feb. 9	Plant Reproduction I	Lab #4 Flower, Fruit, and Seeds	Plant Reproduction II	Plant Development I (Lab #5 Tidepools: Sat. 2/14/26, 1:00-3:00 pm)

WK #6 Feb. 16	Plant Development II	Lab #6 Roots, Stems & Wood	Animal Reproduction & Development I	Animal Reproduction & Development II WAPK Quiz #1
WK #7 Feb. 23	Plant Nutrition – Soil minerals	Lab #7 Invertebrate Dissection	Plant & Algal Nutrition – Photosynthesis I	Plant & Algal Nutrition – Photosynthesis II WAPK Quiz #2
WK #8 Mar. 2	Animal Nutrition I	Lab #8 Tonicity & Osmolarity	Animal Nutrition II	Exam #2
March 9	NO CLASS – SPRING BREAK March 9-13, 2026			
WK #9 Mar. 16	Transport in Plants I	Lab #9 Leaves	Transport in Plants II	Transport in Animals I WAPK Quiz #3
WK #10 Mar. 23	Transport in Animals II	Lab #10 San Diego Zoo Field or Balboa Park trip (focus on plants)	Transport in Animals III	Homeostasis in Animals I GA Quiz #1
WK #11 Mar. 30	Homeostasis in Animals II	Lab #11 Vertebrate Dissection I (perch and frog)	Waste Removal in Animals I	NO class – Easter Break
WK #12 April 6	No class – Easter break	No lab	Waste Removal in Animals II	Waste Removal in Plants GA Quiz #2
WK #13 April 13	Stimulus Detection & Response in Plants I	Lab #12 Vertebrate Dissection II (fetal pig external)	Exam #3	Stimulus Detection & Response in Plants II (recorded lecture)
WK #14 April 20	Stimulus Detection & Response in Animals I	Lab #13 Vertebrate Dissection III (fetal pig internal)	Stimulus Detection & Response in Animals II	Stimulus Detection & Response in Animals III GA Quiz #3
WK #15 April 27	Animal Detection & Response to Stimuli IV	Lab #14 San Diego Zoo field trip (focus on animals)	How do fungi function?	How do protists function? Semester Review (challenges & solutions)
Exam Week				Friday, May 8 Final Exam 10:30-1:00

GENERAL PLNU POLICIES

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. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

Artificial Intelligence (AI) Policy

The use of Artificial Intelligence (AI) tools (e.g., ChatGPT, iA Writer, Marmot, Botowski, 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. Violations of this policy will be treated as breaches of academic integrity.

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 (EAC@pointloma.edu or 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 allowed 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 AP in that particular course. Accommodations are not retroactive so 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 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. 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 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) have experienced other forms of discrimination, you can find more information on reporting and resources at www.pointloma.edu/nondiscrimination.

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 pointloma.edu/Title-IX. 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 counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/Title-IX.

If you (or someone you know) have experienced other forms of discrimination or bias, you can find more information on reporting and resources at www.pointloma.edu/bias

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.

Note: The information below must be included under the “PLNU Attendance and Participation Policy” Section if you are teaching an Online or Hybrid course.

PLNU Course Modality Definitions

1. Online Courses: These are courses with class meetings where all instruction and interaction is fully online.
 - a. Synchronous Courses: At least one class meeting takes place at a designated time.
 - b. Asynchronous Courses: All class meetings are asynchronous.
2. Hybrid Courses: These are courses with class meetings that take place both in the classroom and online synchronously and/or asynchronously.
3. In-Person Courses: These are courses that meet in person with the instructor and students in a physical classroom setting. With approval by the area dean, this may include up to 25% of qualified class interactions through a Learning Management System (such as Canvas).

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.

Loma Writing Center

The Loma Writing Center exists to help all members of the PLNU community cultivate transferable writing skills to engage their academic, professional, personal, and spiritual communities. We work toward this goal by conducting one-on-one consultation sessions, supporting writing education across the PLNU community, and participating in ongoing writing center research.

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. 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: writingcenter@pointloma.edu