

Biology Department	Spring 2026
BIO 3070 Sustainable Agriculture	Dr. Dianne Anderson

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.

BIO 3070 Sustainable Agriculture (2 units)

Catalog description: A study of the various systems used to grow plants in soil using conventional, organic, regenerative agriculture, as well as in nutrient solution using hydroponic and aeroponic systems. In addition, methods of creating new plant varieties, sustainable approaches to plant pathology, and methods of plant propagation will be explored.

This course is designed to promote learning about various ways to reduce the environmental impact of farming while maintaining high productivity. The class activities are designed to provide multiple opportunities for you to see how scientific inquiry is applied to this topic. Outside of class, you will have assigned readings to prepare for class each week. You are expected to do all assigned reading before class, and to come prepared to discuss the content for the day. Biology 2012 is a pre- or co-requisite for this course, so you will be expected to know basic concepts related to basic plant structure, function, and reproduction, as well as how natural selection works. The course is an upper division biology elective.

Course learning outcomes:

1. Develop questions related to overall course themes, then access and summarize appropriate resources, including journal articles, to answer those questions and report findings to the class.
2. Design and carry out experiments, then analyze the data to test hypotheses.
3. Relate plant growth and reproduction to water, minerals, and sunlight.
4. Compare productivity and sustainability of various agricultural methods in terms of the approaches to avoiding pests, reducing weeds, treating diseases, and meeting nutritional and water needs of crops.
5. Compare various ways to create new varieties of plants and to propagate plants for use in agriculture.

Instructor office hours and contact information

dianneanderson@pointloma.edu Office: Rohr Science 146 Phone: 619-849-2705

Office hours: Tuesdays 11:00-12:30, Wednesdays 1:00-2:30, Thurs. 3:00-4:30 or by appointment

Class session schedule

Class will be held on Friday afternoons from 2:45-4:45 PM in Rohr Science 40 and in the greenhouse.

Required book for the course:

Little, Amanda (2019). *The Fate of Food: What We'll Eat in a Bigger, Hotter, Smarter World*. Harmony Books. (WINNER OF THE 2019 NAUTILUS BOOK AWARD)

All other readings for the course with either be posted on Canvas or the link to the document will be posted.

Grading

Points are distributed as follows (subject to change):

Assignment	Points
Syllabus verification	5
Lab summaries/in-class activities (10 pts. X 12 weeks)	120
Weekly reading/watching pre-class assignments (5 pts. X 12 weeks)	60
Projects (5 @ 25 points each)	125
Research Presentation	100
Final Exam	150
Total	560

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

Project information:

Project #1 - Complete a class-related **service project** (2-3 hours) to benefit someone else and submit a brief written summary of what you accomplished (1-2 pages). Include before and after pictures

Project #2 – Visit at least one **Farmer's Market** and one **grocery store**, then record your observations and comparisons in terms of the origin and production method of the fruit and vegetables being sold.

Project #3 - Design, carry out, and analyze a **plant nutrition** experiment based on the type of soil or amount of fertilizer used.

Project #4 – Conduct ten 1-on-1 **interviews** to find out about people's views on food produced using organic and conventional methods, as well as the use of genetically-edited foods, then code the responses and compile the data to write a summary.

Project #5 – Plan a sustainably-designed **horticultural therapy** garden for a particular population (prisoners, children in hospital, dementia patients, etc.)

Research Presentation:

Prepare and present a **summary of current research along with an explanation of key data** (at least four research articles) on a topic related to the class, then propose a line of research to extend the work.

Final Exam

You are expected to take the final exam on the day scheduled unless you have an excuse cleared by me no later than the Friday preceding the exam. 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. The exam will may include a combination of multiple choice, short essay, and lab practical stations.

Attendance, participation, & professional conduct (APPC) score

Class attendance is mandatory. Since the class only meets once a week, at 2 absences, I must contact the Vice-Provost for Academic Administration, and you will be dropped from the course after 3 absences unless there is an exception granted by the administration.

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. To create the best learning environment possible, all students should work in groups when asked to do so. I will often assign groups, and I may 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 on your own. Cell phones must be muted/on vibrate during class. Only in cases of emergency should you leave class to take a phone call. Please, NO texting during class as it distracts both you and people around you. It is important that you bring both your required book and computer with you to each class if at all possible, as you will be using both in almost every class session.

Your APPC score will be determined by the following:

- Default Score: 20/20 points.
- Attendance: Two points may be deducted for every class 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.

Last day to add or drop BIO 3070: January 23, 2026

Schedule of topics and major assignments (subject to change)

Week	Date	In-class topics/labs/activities	Project due
1	Jan. 16	What is sustainable agriculture? Review of plant growth, development and reproduction Intro and plant nutrition (root structure and soils)	
2	Jan. 23	Soil biology and root growth	
3	Jan. 30	Water/sun/minerals Role of data analysis for management	
4	Feb. 6	Plant production – Major farming methods (conventional, organic, hybrid/regenerative)	
5	Feb. 13	Plant production systems, (alternative systems) Urban farming, hydroponics, aeroponics, aquaponics, permaculture, use of pollinator hedgerows etc.	
6	Feb. 20	Plant pathology and pests	Farmer's Market & Grocery store project due
7	Feb. 27	Plant propagation Start hydroponics	
8	Mar. 6	Domestication of plants & animals New varieties of plants (cloning, breeding, genetic engineering, gene editing, etc.) Apple tasting lab	Interview project due
		SPRING BREAK - NO CLASS	
9	Mar. 20	Using plants to solve problems: Phytoremediation & Horticultural therapy	Plant Nutrition project due
10	Mar. 27	Extended farm field trip : 2:30-6:30 PM	
		EASTER BREAK - NO CLASS	
11	Apr. 3		
12	Apr. 10	International development, Fair trade	Horticultural Therapy project due
13	Apr. 17	NO CLASS	
14	Apr. 24	Review/summary of course Clean up in greenhouse	Service project due
15	May 1	Final exam – written and practical	
Finals week	May 8	Research presentations	Research project presentation due

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

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro 1.5, GrammarlyGo, Perplexity, etc) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

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.

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