BIO 6061: Ecology of Plants and Animals (3 units)

January 14- May 9, 2021
Point Loma Nazarene University, Biology Department

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
This course is focused on complex ecological systems with special emphasis on the interactions between plants and animals. Central concepts are addressed from the perspective of teaching for conceptual understanding. The class includes a combination of lecture, discussion, and field-oriented labs.

Course learning outcomes
1. You will able to explain the central concepts relating to population ecology, community ecology and ecosystem ecology.
2. You will be able to articulate the persistent challenges faced by scientists in ecology, including using appropriate sampling techniques, dealing with lengthy time scales of ecological changes, and collecting data in the field.
3. You will demonstrate both an ability to perform, and an understanding of, typical experimental methods and data analysis used in the study of ecology.
4. You will analyze and present representative research papers in ecology.
5. You will access and use databases and journals used in ecology.

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 class delivered over 16 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Instructor: Dr. Eun Sun Kim
Adjunct Professor, Biology Department
ekim1@pointloma.edu
In-person labs will be held at Sator 120
Zoom office hour: By appointment only

Class sessions and attendance
Synchronous zoom sessions Thursday evenings 5:30 pm -7:00 pm or in-person labs Thursday evenings (5:30 pm - 8:00 pm) with occasional field trips on Saturdays

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of W or WF consistent with university policy in the grading section of the catalog. See Academic Policies in the graduate academic catalog.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

All readings will be posted in Modules and accessible online. There are no texts to purchase for this course.

A recommended online textbook is The Princeton Guide to Ecology which you can access through the PLNU library. You will need your login and password every time you open it.

The Princeton Guide to Ecology, edited by Simon A. Levin, et al., Princeton University Press, 2009. *ProQuest Ebook Central*.
https://ebookcentral-proquest-com.pointloma.idm.oclc.org/lib/pointloma-ebooks/detail.action?docID=557123
Not all chapters and topics from this book will be covered. Specific chapters of this book may be assigned for required reading assignments. You may read and refer to other chapters if you would like to learn more about certain topics.

One of the following is suggested as a reference for background reading:
Reece, J. et al. *Campbell Biology*, San Francisco: Pearson Benjamin Cummings
Brooker, R., Widmaier, E., Graham, L., & Stiling, P. *Biology*, San Francisco: McGraw-Hill

Miscellaneous class information
On field observation/lab days, a clipboard may be useful, as well as either good walking shoes or water shoes depending on the location.

Assessment

Labs, Assignments, and Discussions:	
Syllabus agreement	3 points
A Little About You	2 points
14 labs/assignments @ 10 pts each	140 pts
Human survivorship data collection	3 pts
Winogradsky lab	25 pts
Food web assignment	5 pts
Pollination and seed dispersal lab	20 pts
Fire questions	15 pts
Journal Article Analysis Assignments:	
1 larger article poster presentation (pairs)	30 points
Introduction and discussion of journal article (pairs)	20 points
14 smaller article analyses @ 10 pts. each	140 points
Exams:	
3 @ 100 points each (individuals)	300 points
Total points	**703 points**

Grading scale based on percentages (rounding up at 0.5)

A	B	C	D	F
A 93-100	B+ 87-89	C+ 77-79	D+ 67-69	F Less than 59
A- 90-92	B 83-86	C 73-76	D 63-66	
	B- 80-82	C- 70-72	D- 60-62	

Grades will be rounded up at 0.5. For example, 89.5 will receive an A- and 89.3 will receive a B+.

Laboratory, Fieldwork assignments, and In-class activity

Laboratory and fieldwork assignments will focus on analyzing and drawing conclusions from the relevant data. It will be made clear which assignments are to be completed in pairs and which are not. Late assignments will be penalized 10% per day. No late submissions will be accepted 10 days past the due date.

Journal article analyses
The journal articles and other readings that will be made available in on Canvas will make up the required reading for the course. In order to prepare for the class discussion on each article, students will read each article, with the emphasis on understanding the problem that motivated the research and the main points that the article makes. While some effort should be made to understand the research methods, as well as the data analysis, the focus should be on the evidence to support or reject the major ideas, concepts, theories, and hypotheses in the paper. Late article analysis assignments will be penalized 10% per day. No late submissions will be accepted 10 days past the due date.

Introduction and discussion of journal article (pairs)
Pairs of students will choose one of the research articles to introduce to the class and to lead the class discussion. The introduction (approximately 5 min.) should make the article "come alive" for the class and may include some background on the lead authors, info on the location of the study, info on the organisms in the study, etc. Helpful/appropriate images should be used. The leaders should also prepare a list of approximately 5 discussion questions to guide the class conversation (approximately 20 minutes).

Exams
Take-home exams will be posted on Canvas by 12 am on Friday and will be due (via Canvas) by 11:59 pm on Sunday. Exams are open book/open internet and will require integration of course content to demonstrate understanding. While working and studying in groups is encouraged during the week, each take-home exam must represent ***each person's own work***. All questions regarding the test questions themselves MUST be directed to the instructor, not to other students.

Late exams will be penalized 20% for being up to 24 hours late. No exams will be accepted after that time, unless arrangements have been made prior to the exam date. The final exam must be taken on the last day of the course.

General PLNU policies

SPIRITUAL CARE

PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our graduate students to encounter God and grow in their Christian faith. If you have questions, a desire to meet with the chaplain, or prayer requests you can send an email to: gradchaplainmissionvalley@pointloma.edu

In addition there are resources for your Christian faith journey available at the Graduate & Professional Student Spiritual Life web page.

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 the Academic Honesty Policy in the Graduate and Professional Studies Catalog 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 (a) 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 Graduate and Professional Studies 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.

Date	Topics & Schedule (Please see Canvas Modules for weekly assignments and due dates)
Due 1/13/21	For the first day of class, 1/14/2021, read Kim et al. Introduction discussion Syllabus agreement
Week 1 1/14/21	Population Ecology Introductions Population growth
Week 2 1/21/21	Population Ecology No class on 1/21. In-class lab for Winogradsky set-up and field trip to Mt. Hope Cemetery on 1/23 Meet in Sator 120
Week 3 1/28/21	Population Ecology Life tables Survivorship curves Human population growth
Week 4 2/4/21	Population Ecology R vs. K species LTER sites Exam 1 (Due 2/7/21)
Week 5 2/11/21	Community Ecology Biodiversity
Week 6 2/18/21	Community Ecology Competition Predator/prey
Week 7 2/25/21	Community Ecology No class on Thursday, 2/25; field trip to tide pools, estuary, and chaparral on 2/27/21
Week 8 3/4/21	Community Ecology Exotics/invasive species Guest speaker: David Zaya

Week 9 3/11/21	Spring Break (3/8-3/12)—No class
Week 10 3/18/21	Community Ecology In-person lab on 3/18. Meet in Sator 120 (5:30 pm – 8:00 pm) Parasitism Mutualism Pollination/seed dispersal Exam 2 (Due 3/21/21)
Week 11 3/25/21	Ecosystem Ecology Foundations of Ecosystem Ecology Fire ecology Guest speaker: Greg Lloyd
Week 12 4/1/21	Easter Recess (4/1- 4/4)—No class
Week 13 4/8/21	Restoration Ecology Guest speaker: Marines de la Pena-Domene
Week 14 4/15/21	In-class meeting: Sator 120 Fire poster presentation
Week 15 4/22/21	No class on 4/22; field trip to CRSP on 4/24
Week 16 4/29/21	Conservation Ecology Conservation genetics
Week 17 5/6/21	Ecosystem Ecology In-person lab on 5/6. Meet in the classroom (5:30 pm – 8:00 pm) Nutrient Cycling Soil Ecology Decomposition Exam 3 (Due 5/9/21)