BIOL 824: Principles of Ecology

Department of Biology, University of Nebraska at Kearney

Term: Spring 2023

Course Credits: 3

Course Delivery: Online - Asynchronous

Instructor

Dr. Gregory J. Pec, UNK Department of Biology, pecg@unk.edu, office: 308.865.8410

Zoom office hours: By appointment Links to an external site..

Email should be used judiciously to address questions pertaining to course administration/scheduling or urgent matters. I respond to messages as quickly as I can, generally within 24-48 hours. Direct issues related to the course content should be posted to the Canvas forum described below.

Course Description

Ecology is the study of how species interact with each other and with their abiotic environment. There are many disciplines within ecology that we will touch on, including marine ecology, ecological physiology, population biology, and community ecology. This class will summarize current ecological knowledge, and students will read a number of classic papers in the field. Offered online, Spring of odd-numbered years. Per the UNK Graduate Course Catalog.

Course Learning Objectives

This course will emphasize the importance of hypothesis-driven research and will illustrate how the mechanisms underlying ecological patterns and processes are determined using examples from classic and contemporary literature. It is my hope that students of BIOL 824 will gain an understanding of the breadth of ecology and its importance for other fields, including evolutionary biology, conservation biology, agriculture and policy. Finally, the course will train students to critically read scientific literature, assess experimental design and interpret findings from a wide range of ecological studies.

Important University Dates

- First day of the session: January 23, 2023
- University Breaks/Holidays: March 12-19, 2023
- Last day to withdraw: April 21, 2023
- Last day of the session: May 18, 2023

- See the UNK Academic Calendar for other important University dates

Required Texts and Materials

Required Text: Molles, Manuel C., and Sher, Anna A. Ecology: Concepts and Applications. Eighth Edition. 2019. ISBN: 9781259880056.

Readings are assigned from the textbook to complement the lectures and discussions.

Required Technology

- As an online course, access to an up-to-date computer and Canvas several times a week is required (checking in daily is encouraged).
- An updated PDF reader will also be needed to read course materials.
- You may need to use software, such as Microsoft Word, Excel, or PowerPoint or another equivalent.
- Microsoft365 software is available to UNK students for free download.
- Ability to use search engines (for example, Google Scholar Links to an external site.or the Calvin Library search engine) to locate scholarly works is expected of graduate students. If you are not already comfortable with this, I encourage you to reach out to me or the Natural Sciences Librarian at Calvin Library for assistance.
- For issues with Canvas or other technologies associated with your university account, please contact the University technology help desk.

Course Organization

Canvas

For this class we will use an online course management system called Canvas. Course information, updates, and related information, etc. will be posted here. I have also created a forum in Canvas for asking/answering questions about course information.

Participation

The more students are engaged in a course, the more they tend to get out of it. I encourage you to spend at least a little time each day with course material or activities though I recognize this is not always possible.

Communication

Please check course announcements in Canvas frequently. This the primary way I will communicate. Please feel free to reach out to me at any time via Canvas messages, email, or office phone. I will respond as quickly as possible, usually within 24-48 hours. Emails sent after 3 pm (CST) on Fridays will be answered by the following Monday. If sending an email or leaving

a voicemail, please be sure to include BIOL 824 in the subject (email) or message (voicemail) so I can prioritize responding to it.

Course Structure and Assessment

All work is due by 11:59 PM Central Time on the date listed in Canvas and on the course schedule, unless otherwise indicated. This is not a self-paced course. You will be expected to keep up with the pace of the course, and the course structure is designed to help with this. If this is your first distance class, you will find that these classes can be fast paced. Understandably, everyone in this class has several commitments other than this class. Nonetheless, as a student who has registered for this class, it is your full responsibility to ensure that you can meet the requirements and commit the needed time for this course. If you start to fall behind, it may be difficult to catch up. Please do not hesitate to contact me.

Discussion: Weekly discussions provide students an opportunity to critically examine peer-reviewed scientific studies and discuss concepts that focus on the philosophy of science, experimental design, and ways of doing and applying ecological research. Importantly, they also allow students to support one another in learning. Students are expected to uphold UNK Values and any other principles of community identified by your group to establish the discussion board as a supportive and inclusive learning space.

Discussion participation: You are expected to compose at least **three posts** for each discussion (more are encouraged!): one in direct response to a discussion prompt on or before **Friday** and a response to two other students on or before **Monday** of the assigned week. The grading rubric and information regarding expectations for discussion participation are available in Canvas. Participation in each discussion is worth 10 points. There will be 8 graded discussions.

I will follow discussions throughout each module. However, being cognizant that students will be posting at different times during the week and to avoid steering discussion too much, I will generally limit my contributions unless there are areas in need of immediate attention. Following each module, a summary of group discussions will be posted by the discussion leaders (see below) to the corresponding Discussion Recap page for review by all students in the course.

Discussion leading: Each student will be assigned **one module to lead discussion** (40 points). Student leaders are also expected to participate in and will receive a separate participation grade for the discussion they are assigned to lead. See the Discussion Leading Assignment in Canvas for complete instructions, schedule, and grading rubric.

In brief, discussion leaders are expected to present material from the required readings for the module's topic (video presentation). Discussion leaders are also expected to expand the discussion beyond the required readings and will pose two to three thought-provoking questions about the module's topic. Materials are due to be posted to the discussion board by the discussion leaders no later than 11:59 PM Central Time on **Tuesday of the assigned**

module. At the conclusion of the module, the discussion leaders will write a *brief* summary highlighting the main points discussed for each question and post it to the Discussion Recap page of the corresponding module by 11:59PM on **the Monday of the next module**.

Written assignment: There will be two options for the written assignment. Specific subjects for either option 1 and 2 **must** be approved by the instructor.

1. Write a critical assessment of a published paper in a format similar to a "comment" paper found in many scientific journals (these are sometimes found under "notes", "forum", or "short communications"). The paper targeted must have been published recently (within the last 3 years) in a top-ranked ecological journal (e.g., Ecology Letters). The paper and its topic should also be of broad ecological interest. Your task is to synthesize and critique the ideas in the paper in a way that fosters scientific discussion within a diverse audience. Appropriate papers usually involve a controversial or innovative approach or opinion related to some long-standing problem or mindset in ecology. Commentaries on such papers challenge those ideas, and in turn offer new ideas of their own. This is a big-picture assignment that is useful for building critical thinking and synthetic writing skills.
2. Investigate a researcher who has been influential in a broad field of ecology and write an essay that synthesizes and critically evaluates the nature of their contributions. This person should have made several seminal contributions over their career and changed the trajectory of relevant sub-disciplines. Your task is to identify the components or questions, approaches, methods, and philosophy that have made your subject's work exceptional. Your paper should not be a simple biography or chronology. This option could help you identify the approaches and direction you may want to adopt if choosing a path down a more ecological route.

Further details will be provided for this assignment. This assignment must be submitted as a .docx or pdf file format through the Canvas Turnitin function.

Exams: There will be a comprehensive final exam (75 points). The exam will consist of a diversity of types of questions. These may include multiple choice, graphing, matching, fill-in-the-blank, true/false, short or long answer, etc. Example questions will be posted on Canvas prior to the exam.

Basis for final grade

Assessments	**Points**
Paper discussion (participation - 8 wks @ 10 points; leading - 1 wk @ 40 points)	120
Written assignment	50
Final comprehensive exam	75
Total	245

Grades will be assigned using the standard grading scale for the Department of Biology, as follows:

A (93-100%), A- (90-92%), B+ (88-89%), B (83-87%), B- (80-82%), C+ (78-79%), C (73-77%), C- (70-72%), D+ (68-69%), D (63-67%), D- (60-62%), and F (below 60%).

Course Policies and Resources

I take my role as your instructor very seriously; I care about how well you do in this course and that you have a challenging and rewarding experience. It is my commitment to you to respond individually to the work you submit in this class and to return your work promptly.

Grading Policy

Scores for each assignment will be posted on the course Canvas page. If you think there was a grading error or do not understand the feedback you receive on graded work, please contact me as soon as possible. If you would like me to regrade your work, requests should be made within three days after the graded work has been returned to you. Regrade requests may result in a lower grade.

Late Work Policy

As a student enrolled in this course, one of your responsibilities is to submit course work on time. Course work will not be accepted late unless prior arrangements have been made due to *documented* professional or extenuating personal circumstances (e.g., family emergency, participation in university-sanctioned activities, religious observation, etc.). Please contact me as soon as possible to discuss alternative arrangements. Late submissions will be docked 10% per day up to 3 days late. If more than 3 days late, the submission will not be accepted and a grade of 0 (zero) will be recorded for that assignment.

All students at the University of Nebraska Kearney should be aware of the following university-wide course policies and resources.

Attendance Policy

Your instructor may have indicated on their syllabus an attendance policy specific to their class. If so, that is the policy with which you must comply. If no other policy is stated, the University-wide attendance policy will apply.

Undergraduate Student Attendance Policy

Graduate Student Attendance Policy

Academic Honesty Policy

Academic honesty is essential to the existence and integrity of an institution of higher education. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University of Nebraska at Kearney has a policy relating to academic integrity.

Undergraduate Academic Integrity Policy

Graduate Academic Integrity Policy

Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes they may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

- **Local Domestic Violence, Sexual Assault Advocacy Agency** 308-237-2599
- **Campus Police (or Security)** 308-865-8911
- **Title IX Coordinator** 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

Students with Disabilities

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with the UNK Disabilities Services for Students (DSS) office, 175 Memorial Student Affairs Building, 308-865-8214 or by email unkdso@unk.edu

Students Who are Pregnant

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact the Student Health office at 308.865.8218. The following links provide information for students and faculty regarding pregnancy rights. https://thepregnantscholar.org/title-ix-basics/Links to an external site.

https://nwlc.org/resource/faq-pregnant-and-parenting-college-graduate-students-rights/Links to an external site.

UNK Statement of Diversity & Inclusion

UNK stands in solidarity and unity with our students of color, our Latinx and international students, our LGBTQIA+ students and students from other marginalized groups in opposition to racism and prejudice in any form, wherever it may exist. It is the job of institutions of higher education, indeed their duty, to provide a haven for the safe and meaningful exchange of ideas and to support peaceful disagreement and discussion. In our classes, we strive to maintain a positive learning environment based upon open communication and mutual respect. UNK does not discriminate on the basis of race, color, national origin, age, religion, sex, gender, sexual orientation, disability or political affiliation. Respect for the diversity of our backgrounds and varied life experiences is essential to learning from our similarities as well as our differences. The following link provides resources and other information regarding D&I: https://www.unk.edu/about/equity-access-diversity.php

Distribution of course materials: Audio or video recording, digital or otherwise, of lectures, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructors or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s). Any further use or dissemination of this material may be in violation of Federal copyright law and University sanctions including failure in the course.

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced on the course Canvas page.

Tentative Spring 2023 Course Schedule

All work due by 11:59PM CT unless otherwise indicated. Required content not listed here may be provided in Canvas.

Tentative course schedule

Week	Topic	Required Readings	Assessments
1	Introductions Scheduling of discussions groups Video seminar: Introduction to ecology	Course syllabus Ch. 1-3	
2	Discussion: Ecology as a science (Pec) Video seminar: Evolutionary mechanisms and fitness	See "readings for group discussions" Ch. 4	D1

3	Discussion: Are there general laws in ecology? Video seminar: Ecology of individuals - part 1	See "readings for group discussions " Ch. 5-7	D2
4	Video seminar: Ecology of individuals - part 2	Ch. 8, 12	
5	Discussion: Study design challenges: Pseudo-replication Video seminar: Ecology of populations - part 1	See "readings for group discussions" Ch. 9-10	D3
6	Video seminar: Ecology of populations - part 2	Ch. 10-11	
7	Discussion: Experiments in ecology: from microcosms to ecosystem experiments Video seminar: Ecology of interactions - part 1	See "readings for group discussions" Ch. 13	D4
8	Spring Break		
9	Discussion: Statistical approaches & pitfalls (Pec) Video seminar: Ecology of interactions - part 2	See "readings for group discussions" Ch. 14-15	D5 Written paper assignment option
10	Discussion: Evaluating environmental impacts: The Exxon-Valdez (as a case study) Video seminar: Ecology of communities Written assignment prep	See "readings for group discussions" Ch. 16-17	D6
11	Video seminar: Ecology of ecosystems - part 1 Written assignment prep	Ch. 20-22	
12	Discussion: Models in ecology Video seminar: Ecology of ecosystems - part 2 Written assignment prep	See "readings for group discussions" Ch. 18-19	D7
13	Video seminar: Global ecology Written assignment prep Optional meetings	Ch. 23	
14	Discussion: Policy issues and ecology Written assignment prep	See "readings for group discussions"	D8

	Optional meetings		
15	Written assignment prep Final exam prep Optional meetings		
16	Written papers Final exam prep		Written paper assignment
17	Exam Week		Final exam