

# NR306 Natural Resource Ecology Syllabus

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**Instructor**

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**Office Location**

180-517

**Office Hours**

T/TH 9:30 – 11:00 am  
Or by Appointment

**Course Overview**

Ecologists study the distribution and abundance of organisms and how organisms interact with each other and with their environment. In this course, students will have the opportunity to learn about ecological patterns and the processes generating these patterns. Course material will demonstrate how basic ecological principles may be applied to the study of practical ecological problems. The lab section will familiarize students with hypothesis testing and instruct them in methods used to address ecological questions.

**Learning Objectives**

This course:

- Introduces the fundamental principles of ecology and ecological research.
- Provides opportunities for application of ecological concepts to natural systems.
- Exposes students to the application of ecological knowledge.
- Trains students to use ecological tools and methods.
- Prepares students to develop, write, and present scientific research projects.

**Prerequisites**

Requires completion of General Education Life Sciences Lecture (B2) and Lab (B4).

**Required Text**

Smith, T.M. and R.L. Smith. *Elements of Ecology*. Eighth Edition.

**Study Suggestions**

- Attend class. Research shows that students with regular attendance receive (on average) one full letter grade higher than those who do not attend regularly.
- Take notes! You are responsible for the material presented and discussed in class, regardless of whether or not it is on the PowerPoint.
- We all learn differently. Find study methods that work best for you, and practice them.
- Meet with me if you are struggling. I'm here to help, and I love to talk about ecology.

**Class Etiquette**

- Cell phone use is not permitted in class. Keep the texting, emailing, and social media for your own personal time. If you are caught using your phone, you will be warned once and then asked to leave the class. Do not attend class if you feel you have better things to do.
- Refrain from socializing during class. It is distracting to both your peers and your professor. Catch up with your friends before or after class.

## Readings and Assignments

*Assigned Reading:* You are expected to assume responsibility of some learning of new material on your own. The vast body of ecological knowledge cannot be covered during class time. Class time is meant to reinforce concepts and provide examples from real-world scenarios. Preparing for class includes completing the assigned readings. During each lecture, you will be asked to answer one question that applies knowledge from the assigned reading. These assessments will apply toward your participation grade. Readings will include textbook chapters and scientific articles posted to PolyLearn.

*Scientific Journal Readings, Critiques, & Discussion:* You will be responsible for reading one selected peer-reviewed journal article per week (7 total articles). Weekly critiques of the article will be due at the end of class on Thursdays (10 points each, 60 total points). Only 6 of 7 critiques will count toward your final grade, so there is room for you to miss one assignment. One group will lead discussion each week, coming prepared with a summary of the paper and specific questions to drive discussion of the selected article (20 points). The format of the discussion is up to the group leaders and may vary week to week (i.e. large group discussion, small group discussion, activities, etc.). Come prepared to participate.

## Lab Activities and Assignments

**Attendance is mandatory.** We will work in the field for the majority of our labs and will do so regardless of weather conditions. Wear appropriate field clothing, including pants, closed-toe shoes, and long-sleeved shirts. Hazards in the field may include falling rocks, ticks, and poison oak. *Each lab will have an associated lab assignment due the following week.*

## Group Research Projects

Group Research Projects are designed to expose you to all of the steps involved in completing scientific research, from generating a research question to completing a scientific manuscript and giving an oral presentation. You are encouraged to begin thinking purposefully about the project from the beginning of the quarter. Although the quarter does not allow time for data collection, your group will develop a hypothesis based on an ecological topic of interest and follow through with design of scientific research. Discuss ideas and use labs to familiarize yourself with research methods. Projects will conclude with an oral presentation and submission of a scientific manuscript. We will host a research symposium at the end of the quarter, where you will present your proposed research to the class and members of the NRES community.

## Homework Policy

Assignments are to be turned in during class on the due date. Late assignments will be penalized at 20% per day and will not be accepted two days after the due date. This holds true for both lecture and lab assignments

## Academic Dishonesty

Homework must be individual work. It is okay to work with other students to understand the material, but you must write up your own homework assignments. Cheating will not be tolerated. Examples of cheating include, but are not limited to:

- Turning in identical homework assignments.
- Plagiarizing from sources outside of the course. You may use information from books, articles, or websites but must give correct attribution to the source.
- Using one student's homework and changing some words in your version is plagiarism.

## Attendance and Participation

You are encouraged to attend each lecture and expected to attend each lab. Attendance and participation will count toward your final grade. Field labs are meant to support learning and provide you with the opportunity to connect abstract concepts to natural ecosystems. Field labs are also designed to expose you to different topics and sampling techniques, which will provide the foundation for your group research projects. Your presence is essential for your group to function well. *Perfect attendance and active participation will be rewarded with an extra 2% added to your final grade in the class.*

## Grading

Lecture & Lab (500 possible points)

- Scientific Paper Critiques (60 points, 10 points each)
- Scientific Paper Discussion Lead (20 points)
- Population Growth Homework (15 points)
- Bi-weekly quizzes (100 points, 25 points each)
- Quarter Exam (75 points)
- Laboratory Exercises (110 points)
- Group Research Proposal (60 points)
- Research Proposal Presentation (25 points)
- Peer Review (10 points)
- Participation and Attendance (25 points)

Quizzes will be administered at the beginning of class on every other Thursday (beginning January 16<sup>th</sup>). Quizzes will cover the material from lectures (including everything discussed and written on the board), readings, and homework assignments. I assume that each of you is very good at memorizing information, but these quizzes will evaluate your ability to apply knowledge rather than your retention of facts and definitions. The Quarter Exam will ask you to think critically and synthesize material from across the semester. Quizzes will be short answer format (2 – 4 questions), while the Quarter Exam will be one longer question. There is NO FINAL in this class.

Make-up exams will only be offered to students who have extenuating circumstances and with proper documentation.

Grading Scale is as follows: 100 – 93% = A, 92 – 90% = A-, 89 – 87% = B+. 86 – 83% = B, 82 – 80% = B-, 79 – 77% = C+, 76 – 73% = C, 72 – 70% = C-, 69 – 67% = D+, 66 – 63% = D, 62 – 60% = D-, < 60% = F.

*A curve may be generated at any time at the discretion of the instructor.*

## Lab Schedule

Date	Subject	
Jan 7	Naturalist Skills & The Scientific Method (Poly Canyon)	
Jan 14	Traits of Individuals & Populations (Poly Canyon & Computer Lab)	
Jan 21	NO LAB	
Jan 28	Organisms & The Environment (Shell Beach)	
Feb 4	Community Dynamics: Competition & Invasion (Montana de Oro)	
Feb 11	Soils & Ecosystem Ecology (Poly Canyon)	<b>**HYPOTHESES DUE</b>
Feb 18	Community Ecology (Morro Bay State Park)	<b>**MINI PROPOSAL DUE</b>
Feb 25	Biodiversity (Indonesian Reservoir)	
Mar 4	Free Lab Time to Work on Final Projects (Lab & Computer Lab)	
Mar 11	Exam Review Session (Lab)	

## Tentative Lecture Schedule

Date	Subject	Readings** & Assignments
Jan 7	Course Introduction Intro to Ecology & Evolution of Species	Ch 1, Kingsland 2004
Jan 9	Properties of Organisms	Ch 5 – 7
Jan 14	Organisms & The Abiotic Environment	Ch 2 – 4 & 21, Silvertown 2004
Jan 16	<b>Quiz 1 &amp; Paper Discussion</b>	
Jan 21	NO CLASS	Connell 1961
Jan 23	Organisms & The Biotic Environment & Paper Discussion	Ch 8
Jan 28	Competition, Predation, & Trophic Cascades	Ch 13 – 15, Ripple & Beschta 2002
Jan 30	<b>Quiz 2 &amp; Paper Discussion</b>	
Feb 4	Life History Strategies	Ch 10, Gotelli Chapters Population Growth Homework
Feb 6	Population Growth & Regulation	Ch 9 & 11
Feb 11	Nutrient Cycling & Biogeochemistry	Ch 22 -23, Vitousek et al 1997 <b>Population Growth Homework Due</b>
Feb 13	<b>Quiz 3 &amp; Paper Discussion</b>	
Feb 18	Community Assembly & Biodiversity	Ch 17, Gaston 2000
Feb 20	Biogeography & Succession & Paper Discussion	Ch 18 - 19
Feb 25	Landscape Ecology & Island Biogeography	Ch 12 & 20, Laurance 2008
Feb 27	<b>Quiz 4 &amp; Paper Discussion</b>	
Mar 4	Conservation & Global Ecology	Ch 29 – 30, Walther et al 2002 Review Session Questions
Mar 6	<b>Research Symposium: Group Project Presentations &amp; Papers Due</b>	
Mar 11	Wrap-Up & Paper Discussion	<b>Review Session Questions Due</b>
Mar 13	<b>Quarter Exam</b>	

\*\* Chapter readings should be completed prior to each date listed. These readings will be the basis of class discussion.