

Applied Ecology – AEC 400 **Fall 2018 Syllabus**

Climate change, overfishing, habitat loss, altered nutrient cycles, and the spread of invasive species are among the world's pressing global environmental issues. Solutions to these problems are complex, but firmly rooted in the fundamental tenets of ecological theory. The field of applied ecology is premised on using these fundamental ecological principles to help solve real-world environmental challenges. This course will provide an overview of the field of applied ecology, working from through a topical hierarchy from the individual organism to global-scale issues.

Learning Outcomes

By the end of this course, students will be able to: (1) identify and discuss fundamental principles in the ecological sciences, (2) frame some of the most pressing environmental challenges facing the planet, (3) provide specific examples linking ecological fundamentals to real-world environmental challenges, (4) demonstrate an understanding of basic ecological literature, (5) assess popular media accounts of environmental problems, and (6) convey to a non-scientist basic ecological principles and explain how they relate to real-world environmental problems.

Instructor

Craig Layman
calayman@ncsu.edu

Teaching Assistant
To be announced

<http://www4.ncsu.edu/~calayman/>

919 515 6704

Office 248 David Clark Labs

Meeting Times and Office Hours

Lecture Tuesday and Thursday 1:30-2:45 - 220 Dabney Hall

Office Hours Wednesday 11:00-3:00 or any other time by appointment

Course Structure

Twelve modules, spanning ~two class periods each, will provide the structure for the course. The topics will start at the individual organism level and work through a hierarchy to eventually cover global environmental themes. Each module typically will consist of three components. First, I will review, largely by lecture format, a particular fundamental theme/principle/concept in ecology. The intent is to build on information covered in Ecology (BIO/PB 360), working toward an understanding of more advanced ecological principles. We will then introduce particular environmental challenges using (1) your own perspectives on the issues, (2) popular media accounts, and (3) the basic scientific literature. This component will be more discussion based. Third, we will delve into the primary ecological literature to see how scientists are applying basic ecological theory to address the environmental challenge. This scientific literature component will require extensive reading outside of class, so we can focus in class on discussing details of those particular papers. The test essays and video assignments will rely heavily on a detailed understanding of the required readings, and an ability to convey complex ecological principles to non-scientists.

The entire course will be coordinated through Moodle. Students are responsible for all readings, lecture slides, announcements, and discussions will be posted on Moodle. Please contact me if you have questions about using the Moodle site. Readings will be extensive, so make sure and keep up with these; they will form a large proportion of the test grades.

Prerequisites

Ecology (BIO/PB 360) or by permission of the instructor.

Required and Suggested Readings

There are no required books for this course – all readings will be posted to Moodle. Be sure to check frequently for updates, as they are likely to change throughout the semester. You are responsible for all material posted there. A suggested textbook is *Elements of Ecology* (2015 - 9th edition) by Thomas Smith and Robert Leo Smith. I will draw most of the lecture material from this text. For those of you needing a more thorough review of basic ecological principles, this will be a valuable resource.

Course Outline

Introduction (August 23)

Core Course Themes (August 28)

Module 1: Adaptation and Evolution (August 30, September 4 and 6) – *Article 1 due Sept 4*

Module 2: Life History Strategies (September 11 and 13)

Test September 18

Module 3: Properties of Populations (September 20 and 25) - *Article 2 due Sept 25*

Module 4: Metapopulation and Landscape Ecology (September 27)

Module 5: Patterns of Biodiversity (October 2 and 9) – *Video 1 due Oct 2*

No Class October 4

Test October 11

Module 6: Competition (October 16 and 18) - *Video 2 due Oct 18*

Module 7: Predation (October 23 and 25) - *Article 3 due Oct 25*

Module 8: Positive Interactions (October 30 and November 1)

Module 9: Food Webs (November 6 and 8)

Test November 13

Module 10: Ecosystem Ecology (November 15 and 27) - *Video 3 due Nov 27*

No Class: November 20 and 22

Module 11: Global Ecology (November 29) - *Article 4 due Nov 29*

Module 12: Beyond the Science: Why is Applied Ecology so Difficult in Practice? (December 4 and 6)

Fourth Test in University Scheduled Final Exam Slot

Grading

Exams – 75%

All exams will cover the information in that particular quarter of the course. For instance, the final exam will not be cumulative, but will pertain only to material covered in Modules 10, 11, and 12 per the course outline above. Your lowest exam grade of the four will be dropped; each of the other three will count as 25% of the final grade. Exams will contain three sections: Short answer, lists, and essays.

(a) Short answer (25% of exam grade) – These are intended to test a basic understanding of the material. They will be primarily based on ecological fundamentals from the lectures, which often can be gleaned from the lecture slides.

(b) Lists (25% of exam grade) – Frequently in class discussions we will generate lists of alternative answers/solutions to a particular question. For example, we may discuss “Why are food webs so difficult to compile?” or “What makes restoration projects do difficult in practice”. Class attendance and participation in discussions will be critical to do well on this exam section.

(c) Essays (50% of exam grade) – Each test will have 2 essays worth 25% of your exam grade. The essays will be technical in nature and should be structured as analytical paragraphs, in scientific-style writing. Tips of writing structure will be discussed in class and posted to Moodle.

Video Assignments – 15%

A secondary objective in this course is honing an ability to convey scientific principles to non-scientists, and we will do this through short You Tube video assignments. For some of the scientific papers we will study during the course of the semester, the teaching assistant and I will provide a specific question (questions will be presented in class and all posted to Moodle). You are to provide a short video answer to the question (~1-3 minutes). In doing so, a premium is taking the complex science behind the focal study, and conveying information to the viewer in terms a non-scientist could understand. This exercise will also ensure you have read the focal papers before we cover them in class, which will facilitate discussion on the papers with classmates.

You will be provided a grading rubric, example videos and tip sheet to help you on these assignments. All of these will be available through Moodle. Due dates are:

August 31 - September 28 - October 19 - November 14

Popular Press Articles – 10%

Four times during the semester, I will ask you to bring in a popular article concerning the topic we will discuss in the next class. It can be from any media source, i.e., newspaper, internet, podcast, etc. Please print out the document, write your name on it, and hand it in at the end of class. If it is a digital format that cannot be printed (e.g., podcast), write a 1-2 sentence summary, the access point for the media source, and your name, then hand that in. Each of the 4 will be worth 2% of your grade. The other 2% will be the requirement that you briefly summarize one of your contributions at the start of class. There will be 4 presentation days that will assigned early in the semester; each student will just present this one day for the 2% of the final grade. Mention what you found, how it relates to the class material, and why

you found it was interesting. This assignment is intended to further promote in class participation and discussion among students.

Letter Grades

This Course uses Standard NCSU Letter Grading:

$97 \leq \mathbf{A+} \leq 100 \%$

$93 \leq \mathbf{A} < 97$

$90 \leq \mathbf{A-} < 93$

$87 \leq \mathbf{B+} < 90$

$83 \leq \mathbf{B} < 87$

$80 \leq \mathbf{B-} < 83$

$77 \leq \mathbf{C+} < 80$

$73 \leq \mathbf{C} < 77$

$70 \leq \mathbf{C-} < 73$

$67 \leq \mathbf{D+} < 70$

$63 \leq \mathbf{D} < 67$

$60 \leq \mathbf{D-} < 63$

$0 \leq \mathbf{F} < 60$

Additional Grading Information

I will not give make-up exams. If you choose to miss an exam for any reason (religious, work, health, family, etc.), that will count as your dropped exam. Do not ignore the first exam; if you do, you will receive no reprieve later in the semester (even if you have another conflict affecting your performance on that exam). If you miss a test, I will not be able to help you in any other way. Students who have conflicts with any of the exam dates should contact me *before the end of the second week of class*.

Dropping a test is the built in “curve”. There are no other opportunities for extra credit.

Plan to come earlier than usual for the day of the exam - it is your responsibility to be sure that the day of the exam you will not face any conflict with other activities. If you arrive to an exam more than 30 minutes late, or after the first person finishes the test (whichever comes first), you will not be allowed to take the exam and will receive a score of zero. I will not approve excuses that are within a student's control (e.g., not enough time to study, headache, car wouldn't start, I had to go for a job interview, I did not wake up early, traffic was terrible, etc.). It is your responsibility to arrive early enough to avoid these potential issues.

Incomplete grades will be allowed only under exceptional circumstances that are not under your control; detailed arrangements for completion of the required work must be made prior to the end of finals for this semester. If an extended deadline is not authorized by myself or the department, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including summer sessions), or (b) the end of 12 months if the student is not enrolled, whichever is shorter. Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at <http://policies.ncsu.edu/regulation/reg-02-50-3>.

I will make an extraordinary effort and time commitment to help you succeed in this class. But when you do not meet the class requirements, I have no additional responsibilities to help you with your course grade.

The syllabus, as you can well see, is very extensive. Everything regarding the structure of the course is contained herein. Read it carefully and contact me with any questions. This document serves as our binding agreement on the overall structure of the course.

Requirements for Credit-Only (S/U) Grading

In order to receive a grade of S, students are required to take all exams and earn a grade of C- or better. Conversion from letter grading to credit only (S/U) grading is subject to university deadlines. Refer to the Registration and Records calendar for deadlines related to grading. For more details refer to <http://policies.ncsu.edu/regulation/reg-02-20-15>.

Requirements for Auditors (AU)

Information about and requirements for auditing a course can be found at <http://policies.ncsu.edu/regulation/reg-02-15-4>.

If you wish to audit this course, please speak with me during the first week of class to discuss the requirements. At a minimum, regular attendance and completion of assignments are required. No grade will be received.

Attendance Policy

Although roll will not be taken, regular attendance is essential to good performance in this course. Students who do not attend and participate in class on a consistent basis typically do not do well on the exams. Attendance on exam days is required. For complete attendance policies, please see <http://policies.ncsu.edu/regulation/reg-02-20-3>

Academic Integrity and Academic Honesty

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at <http://policies.ncsu.edu/policy/pol-11-35-01>. I take seriously my responsibility to provide a fair environment for all students in this course, so all violations and suspected violations of this policy will be reported to the Office of Student Conduct.

See <http://policies.ncsu.edu/policy/pol-11-35-01> for a detailed explanation of academic honesty.

Honor Pledge

Your signature on any test or assignment indicates "I have neither given nor received unauthorized aid on this test or assignment."

Class Evaluations

Online class evaluations will be available for students to complete during the last two weeks of the term. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will not know how any one student responded to any question, and students will not know the ratings for any instructors.

Evaluation website: <https://classeval.ncsu.edu/>

Student help desk: classeval@ncsu.edu

More information about ClassEval: <http://www.ncsu.edu/UPA/classeval/>

I also encourage you to post thoughts on on-line resources such as Rate My Professor. These sites are widely used by students, faculty and administrators.

Electronically Hosted Component

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (<http://www.ncsu.edu/dso>), 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at <http://policies.ncsu.edu/regulation/reg-02-20-01>.

Non-Discrimination Policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.