

RESTORATION ECOLOGY (ENEC 304-001)

COURSE DESCRIPTION:

The practice of restoring ecological systems has been conducted in some form or another for hundreds of years. In contemporary societies restoration efforts have focused on returning a disturbed ecosystem to some historical condition defined by the stakeholders. Consequently, modern restoration ecology attempts to recover the composition, structure, and function of ecosystems. Ecological restoration projects are interdisciplinary and must consider social, political, economic, engineering, and scientific issues to be successful. In this course we will focus on what ecological science contributes to restoration ecology; more specifically you will develop an understanding of ecological theory as it is applied to restoration projects.

A primary focus of this class is to provide you with practical hands-on research experience working on restoration projects. Therefore, we will spend much of our class time devoted to developing scientific research, field, and quantitative skills (this is a CURE course) that you will apply to a semester-long research project. This is also an APPLIES service-learning class so you will be required to devote 30 hours outside of class to a specific local restoration project that will be the focus of your final research project. See separate syllabus at the end of this document.

COURSE FORMAT:

Time & Place: Mondays and Wednesdays 3:35 – 4:50 am in Greenlaw 318

Instructor: Dr. Geoffrey Bell
Curriculum for the Environment and Ecology
3305 Venable Hall
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gwbell@email.unc.edu

Office hrs: Tuesdays & Fridays 1:30 – 3:00 or by appointment

PREREQUISITES:

This class will build on foundational concepts in ecology, statistics, and experimental design. Therefore, you must either be a science OR environmental studies major that has completed at least one semester of an ecology class (ENEC 202 may substitute for an ecology class) and taken an introductory statistics course or at the very least is familiar with basic statistical concepts.

COURSE OBJECTIVES:

I have four main objectives for students in this course:

1. Understand the ecological concepts relevant for restoring ecosystems and critically think about the scientific/logistic challenges of applying these concepts into a restoration plan.
2. Learn how to critically read articles published in the primary scientific literature.
3. Learn the ecological processes that control the structure and function of a specific ecosystem by participating in an ongoing restoration project and developing a restoration plan.

4. Advance your field observation, data collection, and data analysis skills by developing a scientific research project.

COURSE STRUCTURE:

This course utilizes a variety of teaching approaches, including discussions of readings, instructor lectures, guest speakers, field trips, and hands-on opportunities to participate in restoration projects.

- **Class periods:** Class time will be a combination of discussions, active learning activities, and service project consult sessions. For discussion and learning activities you will be required to complete background readings and/or watch lecture videos before coming to class. For certain topics I will post an online quiz to complete before class to assess your understanding of the material. On days when groups are presenting a component of their service research project you are expected to think critically about their project and provide constructive feedback that will enhance the quality of their project.
- **Practical experience:** You will be provided with several opportunities to participate in new and ongoing restoration projects for various ecosystems throughout North Carolina. These hands-on experiences will be of two types. The first type will be fieldtrips as a class to various local sites during regularly-scheduled class periods and day-long or overnight trips to more remote locations in NC outside of class times. The second type will be as a small group at a local restoration site of your choosing working towards fulfilling your APPLES service learning restoration project research project (see below). Students need to coordinate their own transportation to their field site as there are no funds available to rent vans.

ATTENDANCE:

- **Class periods:** Attendance is mandatory for classroom lectures/discussions as well as fieldtrips during normal class time. I will take attendance, and excessive absences will lower your final grade. You are allowed 3 absences before your grade will be lowered and it does not matter why you were absent (i.e., all 3 count as “excused absences”). Each additional absence after #3 will result in a 2% reduction in your final grade, regardless of the reason.
- **Field trips:** We will meet as a class at both on-campus natural areas (e.g., Battle Park) and nearby off-campus locations two to four times during the semester during normal class periods that may require extended time. These fieldtrips are mandatory and you should make every effort to stay for the entire length of the activity. It is also possible that I may organize a trip or two to more remote locations to meet with professionals at one of their restoration sites that may be day-long. Attendance is not mandatory for these field trips but you are encouraged to make reasonable arrangements to attend. I will post the dates as soon as I make arrangements with the managing agency. Every effort will be made to find dates that accommodate as many students as possible.
- **Service:** Each student **must commit at least 30 hours of service** to a specific restoration project that you will use as a case study for your final group project. Your restoration group is solely responsible for coordinating your visits to the site with the person that is managing the

restoration project. Your supervisor will record the number of hours that you work and will evaluate you on your level of engagement. A description of the service projects will be provided within the first two weeks of the semester.

ASSESSMENTS:

- **Pre-class homework:** On most days when we will be discussing readings or doing active learning exercises there will be a short homework assignment that tests your understanding of the concepts in the required readings or lecture videos. These will be given online through Sakai's Tests & Quizzes option and due before the start of class.
- **Class participation:** For each class period, your student participation grade will be evaluated based on your level of engagement in the activity or discussion. More specifically I expect that you contribute frequently, show a genuine interest in learning, and pose critical questions/comments. Your service project supervisor(s) will also evaluate you on your work ethic, reliability, and engagement in the project. It is not sufficient to simply show up and do the work. You must engage your supervisor and others in trying to understand how the specific task you are doing helps achieve the goals of the restoration project.
- **Reflections:** Reflections are short assignments that will assess your understanding of the concepts for a topic or group of related topics covered during class. Examples of reflections include: a hypothetical scenario where you are asked to apply the concepts covered during class, an explanation of a concept or concepts, a description of how a concept is relevant for your service project, or a short quiz that assesses your understanding of applied concepts.
- **Service Project:** The restoration project you are assigned to is the capstone of the course. It will involve working in small groups (3 – 6 students) in natural areas that are suspected be in need of restoration or are actively being managed by a community partner. You will complete a series of assignments that will keep you on track for completing the research project (e.g., literature review, proposal, preliminary data analyses, etc.). The final oral and written reports will be **due during the final exam period**. I will provide a handout later in the semester that will provide specific instructions and suggestions on the kinds of formats that are acceptable. Each team member will be subject to frequent peer reviews to ensure that everyone is contributing to the project. **Your individual grade on each assignment can be raised or lowered based on your score on peer assessments**

LEARNING/READING RESOURCES:

Restoration ecology is an emerging and interdisciplinary field. As such, there is no universally accepted textbook and different textbooks have very different perspectives on the subject. Therefore, I will select readings from the following resources throughout the semester.

- Howell, E.A., J.A. Harrington, and S.B. Glass. Introduction to Restoration Ecology. Island Press, Washington DC. 418 pp.
- Falk, D.A., M.A. Palmer, & J.B. Zedler 2006. *Foundations of Restoration Ecology*. Island Press, Washington D.C.

- Clewell, A. F., and J. Aronson. 2007. *Ecological Restoration: Principles, Values, and Structure of an Emerging Profession*. Island Press, Washington, DC.
- Society for Ecological Restoration International Science & Policy Working Group. 2004. *The SER International Primer on Ecological Restoration*. Available on-line for free at: <http://www.ser.org/pdf/primer3.pdf>
- Various primary literature articles from journals dedicated to the field including *Restoration Ecology* and *Ecological Restoration*, as well as many other journals.

GRADING

Your final grade will be based on the following components:

<u>Course Component</u>	<u>% of Final Grade</u>
• Class participation	16%
• Pre-class Quizzes	8%
• Reflections	8%
• Service Project	
• Progress reports (e.g., literature review, oral proposal, written proposal, methods & results draft, etc.)	8 – 10% (depending on number of assignments)
• Final report (oral)	16%
• Final report (written)	18%

Course grades are based on the following scale: A >= 93; A- = 90-92; B+ = 87-89; B = 83-86; B- = 80-82; C+ = 77-79; C = 73-76; C- = 70-72; D+ = 67-69; D = 63-66; D- = 60-62; & F < 60.

Student Responsibilities: All work in this course must be carried out within the letter and spirit of the UNC Honor Code (see pages 472 – 473 in the 2015-2016 Undergraduate Bulletin). Although service projects are a team-based exercise, I expect that each team member contributes equally to the research project. Quizzes must be completed on your own without collaborating with other students. It is your responsibility if you have any doubt to confirm with the instructor whether or not collaboration is permitted.

APPLES

Service-Learning

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What is the APPLES Service-Learning program?

APPLES is a service-learning program founded in 1990 by students who believed learning extends beyond the walls of the classroom. Each year, more than 2,400 students are involved with APPLES programs, which are a part of the Carolina Center for Public Service's array of student programs.

What is service-learning?

Service-learning is a type of experiential education that involves the integration of academic coursework with meaningful and relevant community service.

Students are expected to commit to:

- Three to five hours a week of service for 10 weeks, for a minimum of 30 hours,
- Serve with one organization provided by the instructor of the course, and
- Complete documentation for your instructor (time logs, service-learning agreements, etc.).

When contacting community partners:

- Identify as being enrolled in an APPLES course.
- Explain interest in being an APPLES volunteer with the organization.
- Some community partners require an orientation, training, applications, interview, etc.
- Keep in mind community partners want to get to know students before confirming volunteers.

When do students begin volunteering?

Immediately initiate contact with the community partner once the instructor confirms where each student will volunteer; often by the second or third week of class.

How do students know what is expected?

The placement list or other information provided to students details what each community partner requested. During an initial meeting with the supervisor at the organization, students should ask more questions about expectations regarding communication, schedule, appropriate dress, deliverables, etc.

Partnership Grants

One way to deepen a service-learning experience is to apply for a partnership grant. These grants fund supplementary materials for enhancement projects related to your community partner. Ten partnership grants of up to \$100 each are awarded each semester. Applications must be submitted

with both the approval of the community partner and faculty member. For more information, visit ccps.unc.edu/apples/.

Where is APPLES located?

The APPLES Service-Learning program is located in the Frank Porter Graham Student Union, suite 3514. Please contact us with any questions, comments or concerns.