

Syllabus

Course: Principles of Ecology Laboratory (Biol 4254): Summer 2007

This is a Service-Learning and field work intensive course

Lab coordinator: Dr. David Brown
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Lab instructors: David Anderson dande21@lsu.edu

Classroom: 232 Life Sciences (old building)

Class Sections:	01	Monday and Wednesday	1:40 - 4:30	Brown
	02	Tuesday and Thursday	1:40 - 4:30	Anderson

Prerequisite or co-requisite: Principles of Ecology (Biol 4253), and Introduction to Statistics (Exst 2201) or Calculus II (Math 1552)

Text: Molles, Manuel C., Jr. (2005). *Ecology: Concepts and Applications*, 3rd edition. McGraw-Hill.

Course Overview

This course is about learning to conduct research with natural populations and communities. This lab is a practical, but independent extension of the lecture (Biol 4253). It is a hands-on course in which students will apply a number of field and analytical techniques to the study of ecological systems. You will recognize many ideas and approaches from lecture examples, but here you will use your knowledge of ecological theory and methodology to conduct real research projects. The semester will be divided into two projects: spider ecology and land management of protected natural areas. For each project, you will work in teams to develop and refine project proposals, and then implement your studies. The first project, spider ecology, will be basic research. That is, building knowledge to address curiosities and answer scientific questions that don't necessarily relate to specific human or environmental needs. Applied research, the focus of the second project, builds on basic research to address practical problems. For the second project, you will develop and initiate a biological inventory program for BREC, the East Baton Rouge Parish recreation department. This is applied research because it addresses a specific land management need of BREC. We will present study design proposals to BREC and then implement a single, refined protocol to gather baseline data, which will be delivered to BREC at the end of the semester. In later semesters, we will re-sample at the study sites we initiate this semester. Thus, we are beginning a long-term database that BREC will use to monitor their natural resources, plan management activities, and develop interpretive materials. These projects require teamwork and field work. In particular, you will be exposed to the worst of Louisiana's heat, humidity, and other natural hazards. Finally, biology labs typically require more work per credit than lectures, this lab is no exception, expectations and workloads will be challenging. Consider carefully, now, whether or not you are up to the task. If so, this lab will provide you with an informative introduction to conducting research in ecology.

Learning Objectives

Research in Action:

- **Hypotheses and predictions:** This begins by observing and questioning natural patterns. Based on the observations of yourself (observing natural processes) and others (in the research literature) you will develop hypotheses to explain these patterns. From there, you will learn to develop testable predictions of these hypotheses.
- **Biostatistics:** In particular, you will learn and be able to use basic principles of biostatistics, including, study design (randomization, replication, etc...), data analysis, interpretation, and assumptions & limitations of study designs and analytical approaches.
- **Field techniques:** For each of the field-based projects you will learn and be able to demonstrate competence in the use of different field techniques.
- **Communication of results:** You will write research proposals & reports, and give oral presentations of your research findings. Scientific-style writing and oral presentations likely will be new territory, and a struggle, for most students.

Research in the real world:

- **Louisiana ecology and habitat quality:** Whether you're a Louisiana resident or an out-of-state student, learning about local natural history will enrich your experience here. Because our field trips will take us to several typical Louisiana habitats, we will have the opportunity to consider a fundamental question in ecology, what makes a habitat good?
- **Applied Ecology and Civic needs:** You will demonstrate ability to work with a team to address a community-based ecological research problem. In particular, you will contribute to the development and implementation of a biological monitoring protocol for BREC.

Grading

Statistics worksheet	5%
Quizzes	5%
Geography worksheet	5%
Reflective activities	5%
Field techniques demonstration	5%
Participation	10%
Spider Ecology	
Proposal	10%
Written report	10%
Presentation	10%
BREC-land management	
Proposal	10%
Written report	10%
Presentation	10%

Scale: A = 90-100%, B = 80-89.9%, C = 70-79.9%, D = 60-69.9%, F = < 60%

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Worksheets: These are homework assignments to help you develop skills in designing research and analyzing data.

Quizzes: There will be unannounced and scheduled quizzes throughout the semester. You will be quizzed on reading assignments, statistics, graphing, homework assignments, etc. Quizzes will cover material from preceding and forthcoming labs, so read the appropriate chapter before class.

Reflective activities: These prompt you to consider how your experiences conducting basic and applied research are affecting your views of environmental and social issues, and the civic responsibilities of professional scientists. Reflection is also a platform for integrating field experiences with theoretical learning. The format of these will include written assignments and class discussions. Written assignments will be periodic (due dates TBA) and structured by a list of specific questions requiring 1-2 pgs of response. Class discussion of civic issues will precede and follow each project.

Field technique demonstration quiz: This will be an oral and hands-on quiz in which you will demonstrate skills in using several field techniques that we learned through the semester.

Participation: Participation points are not “guaranteed”, you have to earn them. Participation is assessed based on several factors including attendance, preparation for each class (reading the chapter and knowing what is expected of you each day), enthusiasm in classroom and field settings, your willingness to engage actively in field activities (carry gear, setup plots, get dirty if necessary), and your willingness to help other students, ask pertinent questions and take advantage of office hours. Also, you will be evaluated by your group peers. Their ratings of your effort and performance will be an important factor in determining your participation grade. Behaviors that are poorly reflected include arriving to class late, use of cell phones during class time, frequent irrelevant questions such as “can we drop this grade?”, and “are we going in the field today?”, or other behavior that disrupts the flow of class. Basically, good students will be prepared for class and participate accordingly. SMOKING during class time, including on field trips, is strictly prohibited.

Late Assignments: Assignments are expected to be turned in on time. You will be penalized 10% of the assignment grade for each day that it is late.

Attendance: Your presence and participation in lab is mandatory. The summer semester moves quickly and there is limited opportunity to make up a missed laboratory. If you are unable to attend a class, it will be your responsibility to obtain permission to make it up (a valid excuse must be approved by your instructor). You are expected to attend the lab section in which you enrolled, however, there is a second section of this course and you may attend an alternate lab if you obtain prior permission. If you are unable to attend a lab, you will be assigned makeup work. It is your responsibility to make such arrangements.

Disclaimer on course flexibility: The syllabus, the schedule listed below, assignments, and the material documented in the following chapters may be changed at any point in the semester. In fact, because of weather, and other logistical uncertainties related to the dynamic nature of our service project and field ecology in general, you should expect changes. So be flexible. Also, instructors of this course are given latitude so as to emphasize their own research and teaching strengths. Thus, the material covered and the specific requirements of each assignment may differ between sections. If you have any problems during the semester please contact the coordinator (David Brown, dbrown5@lsu.edu).

Course Schedule

DATE	TOPIC	ASSIGNMENTS DUE
Jun 11	Course introduction; Statistics & Graphing	
Jun 13	Field techniques- Blackwater/Comite River (field)	Statistics worksheet
Jun 18	Spider Ecology: proposal review panel	Spider pre-proposals Quiz
Jun 20	Spider Ecology (field)	
Jun 25	Spider Ecology (field)	
Jun 27	Spider Ecology	Spider: Preliminary report Geography worksheet (in-class)
Jul 2	Spider Ecology	Spider: Report and presentations
Jul 4	Independence holiday: No lab	Fish Populations: Coversheet
Jul 9	Conservation of BREC Natural Areas (field)	
Jul 11	Conservation of BREC Natural Areas	Natural Areas: Pre-proposals
Jul 16	Conservation of BREC Natural Areas (field)	
Jul 18	Conservation of BREC Natural Areas (field)	Field techniques demo
Jul 23	Conservation of BREC Natural Areas (field)	Natural Areas: Preliminary report
Jul 25	Conservation of BREC Natural Areas	Report and Presentations for BREC

*Due dates for reflection activities will be announced.

Risk and Safety on Ecology Field Trips

Field Trip Insurance: The University has no liability in the case of injury to a student as a result of an accident while on a class trip. It is strongly suggested that you have personal insurance. However, the Department of Biological Sciences arranges trip insurance of up to \$2500 per person for accidental injury, this insurance will be provided automatically on all trips.

The following list includes many of the risks and the associated precautions that you need to be aware of for this class. This list is not exhaustive, other unlisted risks are present. Field trips are an inextricable part of ecology and this course. Field trips are inherently risky. Be safe by knowing the risks and taking precautions. If you anticipate major problems with any of these risks, you are encouraged to drop this course. For all field trips, you are required to wear long pants, and covered shoes. Without these basics you will not be allowed in the van. If you have severe allergies or other medical conditions that may be an issue, notify your instructor or the lab coordinator before the first field trip.

Travel: Wear your seat belt at all times that the van is moving. Be careful when walking on roads and in parking lots. Don't distract the driver. If you will be using your own vehicle you must sign the form titled "Certificate of privately owned automobiles" prior to the trip.

Heat and Dehydration: Bring and drink an adequate quantity of water. Wear a shade hat. Apply sunscreen. Be aware of your body condition, and alert your instructor if you suspect you're overheated.

Poison ivy: Wear long sleeves, use *tecnu* cleanser before anticipated exposure and after suspected exposure. Shower after the field trip.

Mosquitoes, ants, chiggers, ticks, spiders, wasps, bees, and others: Wear long sleeves, and apply insect repellent. For chiggers, repellent should be applied to your skin and clothing around ankles and waist line, and don't sit down. For fire ants, watch where you're stepping, and don't sit down. Shower after the field trip.

Snakes: Stay alert, watch where you step. In case of a snake bite: try to identify the snake, but don't kill/capture the snake. Stay calm. Seek medical assistance immediately.

Twisted ankles, scratches: Stay alert about your surroundings. Wear shoes with adequate ankle support. Wear long sleeves.

Wet clothes, cold: On cold field days, wear warm clothes, preferably made of synthetic or woolen material. Cotton is a poor material for field work because it retains fluid. In cold weather, wet cotton clothing (from sweat, rain, or falling in water) can quickly lead to hypothermia. If rain is anticipated, we will provide rubber ponchos. If in doubt, bring a rain coat.

Microbial infections: Keep your hands out of your mouth. After labs, particularly if you came into contact with water, cleanse your hands with anti-bacterial wash (usually there's some with the field gear or in the van).

I acknowledge having read the above list of some of the risks and safety precautions associated with Ecology lab (Biol 4254), and the University policy on liability and trip insurances. I hereby release the instructor and the University from liability in the event that something does happen. I further acknowledge that this list does not include all possible risks.

Signature _____ Date _____

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Agreement to complete work independently:

Student Copy

Although I will work in groups to collect data, and I will work with another classmate on a group project, I am responsible for independently completing all other coursework including data analyses, graphs and figures, and writing lab reports and worksheets. Cheating, copying, sharing work, or other forms of plagiarism will not be tolerated. I acknowledge that if I fail to follow these rules that the instructor will forward my case to the **Dean of Students** for disciplinary action. The consequences for proven violations of the Code of Student Conduct are very serious and can result in a grade of F in the class, a permanent transcript notation to indicate the dishonest student was caught cheating, suspension or even expulsion from the university.

I will adhere to University policies for Academic Integrity and the Code of Student Conduct.

Name

Signature

Date

Agreement to complete work independently:

Instructor Copy

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