

Ecological Field Methods

475 Fridays 1:00 - 5:00pm, Central King Building 326

Fall 2015

Biology

Instructor: Maria Stanko

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Course website: moodle.njit.edu/

Office: CKB 340E

Office Hours: Mon 2:00-4:00 or by appt.

Description: Exploration of the natural systems around you inspires endless scientific questions. In this class, we'll travel to a variety of sites near campus, using each to become familiar with the types of ecosystems found in our area, to identify common plant and animal species, and to address ecological questions employing common methods used in the collection of ecological data. In addition to field techniques, you'll learn how to design an experiment to test a scientific question, to apply different statistical tests commonly used to analyze ecological data, and to report scientific results in written and oral format. Using what you've learned throughout the semester, each student will design and carry out an independent ecological field experiment and present the results in a class research symposium at the end of the semester.

Prerequisite: BIOL 205&206 AND permission of the instructor.

Text: McMillan, V. E. 2012. Writing papers in the biological sciences. Bedford/St. Martin's, Boston, Massachusetts, USA.

Additional readings: Labs will be posted on the course website (<http://moodle.njit.edu>).

Students are required to read the posted lab description prior to attending class. Quizzes will be given at random to ensure students come to class prepared.

Writing Intensive/Honors: This NJIT honors course fulfills the Rutgers writing intensive requirement. We will emphasize scientific writing throughout the semester through reading of primary scientific literature, composition of weekly article summaries, and the development and writing of a scientific paper describing your own research project. Writing assignments associated with this goal include:

a. Weekly Article Summaries – Most weeks, you will be asked to research and choose a scientific article relevant to the subject for the week, read it thoroughly, and write a one-page summary of the article (more detailed instructions will be given in class). Your goal is to concisely convey what scientific question was addressed in the paper, why that question was of interest, how the experiment was conducted, what was found, and what the results mean. I will provide feedback on each summary that you should use to improve your writing on future summaries.

b. Final Paper – You will write a final paper in the format of a scientific journal article describing your own independent research project (more detailed instructions will be given in class). In addition to feedback on your research question and experimental design, I will offer extensive comments on the draft of your paper, which is due three weeks prior to the final due date. Only the final version of the paper will be graded, though submission of incomplete drafts will result in penalty to your grade.

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Grading: Grades will be assigned based on the percentage of points you earn out of the total possible, following the standard grade scale. Please note that the number of assignments and article summaries is estimated and may vary, affecting final total possible points.

Participation	45
5 Quizzes (5 points each)	25
6 Lab Homework Assignments (15 points each)	90
6 Weekly Article Summaries (15 points each)	90
1 Oral Presentation (30 points)	30
1 Formal lab report (50 points)	50
1 Final Exam (50 points)	50
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Schedule: Please note that the schedule below is the proposed schedule. I reserve the right to change lab topics and/or locations due to weather or other conflicts.

Date	Topic	Location	Reading/ Assignments Due*
Sept. 4	Course Basics: Statistics, Excel, Literature Search	on campus	Introduction & Chapter 1, Writing Summaries
Sept. 11	Pollination	Hutcheson Memorial Forest	Chapter 2
Sept. 18	Paper writing/Tree Allometry	South Mountain Reservation	Chapter 3
Sept. 25	Tree demography & herbivory	Morristown Natl. Hist. Park	Chapter 4
Oct. 2	Spatial dispersion	Sandy Hook NRA	Chapter 6
Oct. 9	Species-area & diversity	Cheesequake State Park	Chapter 10, pp. 210-217 Project proposal due
Oct. 16	Amphibian survey	Hacklebarney State Park	
Oct. 23	TBD – student projects!	TBD	Chapter 7
Oct. 30	TBD – student projects!	TBD	Chapter 8
Nov. 6	Aquatic sampling	Ken Lockwood WMA	Chapter 10, pp. 191-201
Nov. 13	Soil differences among microhabitats	Great Swamp NWR	Paper draft due!
Nov. 20	Survivorship curves	TBD	
Nov. 25 (Wed)	Animal behavior	Bergen County Zoo	NO CLASS ON FRIDAY 11/27
Dec. 4	Presentations	on campus	Presentation & paper due
Dec. 15-21	Date TBD - Final Exam	on campus	

*There will also be a homework and/or a writing assignment to complete following EACH lab which will be due by the following class period. In the interest of space, these assignments are not listed.

Attendance, lateness, and make-ups: Absences will only be excused for documented (doctor's or dean's note), valid reasons. In case of an emergency or absence, notify me prior to the trip. **BE ON TIME TO LAB.** If you are not there when the van leaves, you will be counted as absent. More than 2 unexcused absences will result in failure of the course. Make up exams and quizzes will be possible only with a doctor's or a dean's letter or with prior approval. Late assignments will be accepted, but penalized 10% of the points available for each 24-hour interval that they are late. The writing revision process is an important part of this course; if you do not submit a rough draft, you will automatically lose 15 out of 50 points for the paper.

How to dress for class: For weeks when we have a field trip, please wear comfortable shoes (sneakers are fine) and pants, and dress so that you'll be comfortable outdoors for several hours. In the absence of lightning, we will go out in the rain/snow, so please bring a raincoat or umbrella if rain is in the forecast. On snowy/wet days, your feet will be more comfortable in waterproof boots. Make sure you always bring winter hats/ coats/ gloves on cold days! Dress in layers, bring insect repellent or sunscreen if you wish, and always bring water!

Learning Outcomes: Students are able to....

1. Describe the types of ecosystems found in our area.
2. Identify common plant and animal species found in local ecosystems.
3. Research topics using electronic and print sources and attribute sources properly.
4. Design and carry out an experiment to test an ecological question.
5. Apply different statistical tests commonly used to analyze ecological data.
6. Communicate scientific results in written and oral format.