FUNDAMENTALS OF ECOLOGICAL RESEARCH
ENV 1004, Spring 2026
Prof. Amanda Flores

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Course schedule and location

Lab
Tu/Th, 2:55 – 4:35 PM

Office hours by appointment
via Zoom

Course Description:

Fundamentals of Ecological Research is a hands-on course designed to teach students the basic concepts and methodologies used in the field of ecology. The significance of ecological research to current environmental issues, both local and global, will be stressed throughout the course.

Pathways Common Core Learning Outcomes (Life and Physical Sciences)

- Identify and apply the fundamental concepts and methods of life or physical science.
- Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.
- Use the tools of a scientific discipline to carry out collaborative laboratory investigations.
- Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.
- Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

Course Objectives (Learning Goals)

1. Students will be able to use mathematical and conceptual models from ecology to **predict** impacts of change on behavior, populations, communities, and ecosystems.
    - Meets the following **Life and Physical Sciences** learning outcomes
        - *Identify and apply the fundamental concepts and methods of a life or physical science*
2. Students will be able to **describe** the scientific process, the process from how experiments are conceived to execution and presentation (eg., publication following the scientific review process), and explain the need for research ethics

- Meets the following **Life and Physical Sciences** learning outcomes
    - *Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.*

3. In relation to a specific topic, students will be able to **develop** and **test** hypotheses by collecting data using basic experimental tools (e.g. microscopes, reagents) and techniques (e.g., mark-recapture method), analyze data, and share results through written and oral presentations
    - Meets the following **Life and Physical Sciences** learning outcomes
        - *Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation*
        - *Use the tools of a scientific discipline to carry out collaborative laboratory investigations*
        - *Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report*

All of the above concepts will be considered in relationship to the management and restoration of natural resources in the New York area and beyond. By the end of this course, you should be able to discuss the complex linkages among biotic and abiotic factors that impact natural communities, **explain** how these factors may be measured, and **predict** impacts of change.

Course Structure: The course will focus on learning about science through activities.

Readings: You will have readings assigned from the course website and possibly other material to introduce you to each lab. You should read this material prior to attending class so that you have a general understanding of the daily tasks and can ask pertinent questions. **Material from these assignments may appear on the exams even though it may NOT be covered in lecture.**

Lab Introductions: I will give short lectures to introduce lab exercises. Material presented in these introductions will parallel and supplement the material in the required readings. That is, some parts of the introductions will elaborate on material presented on the course website, whereas other parts will consist of novel material that is not covered on the site.

Lab and activities will consist of activities that expose you to tools and issues faced by ecologists.

- Most will be hands-on laboratory activities (see the course schedule, posted on our course's Brightspace page).
- Some of these will consist of running simulations to create data that you can analyze and discuss; others will be hands-on group activities.
- These will range from handling and analyzing existing data sets to collecting information on biodiversity.

- Lab assignments will be worked on in class, where I will be available to address any questions, and can be finished on your own time if necessary. I will also be available during office hours to answer questions. You can also contact me to arrange other meeting times.

Time Commitment: Previous versions of this course had a workload of ~2.5 hours per week outside of class time, including pre-lab readings and finishing assignments and group projects outside of class. Several assignments may be completed during class hours, depending on the activity and how long the pre-activity lecture portion takes.

Course Materials and Tools Note: This is a zero-textbook course and part of the zero-textbook initiative at CUNY. All resources are freely available from CUNY or other sources. Please let me know if you need help finding these resources. You should not have to purchase any resources.

All material (text links, lecture slides) is available @ https://sites.google.com/view/env10031004. Material is viewable from desktop, laptop, or mobile devices.

All assignments will be submitted via Brightspace; assignments will not be accepted via email. It is the student's responsibility to check the course website on a regular basis for new assignments. If you are not familiar with Brightspace, ask questions or visit this short guide.

Additional Course Materials: A laptop (or suitable internet device) will be needed for homework and classwork activities.

Lab Assignments

Homework and Classwork: Assignments will focus on preparing for labs, carrying out lab exercises, and answering questions post-lab related to exercises. Assignments from Tuesdays will be due on Fridays, and assignments from Thursday will be due on Mondays.

Exams (2): Exams will include the material we have covered up to the day of the exam.

Writing Assignment: 1 properly formatted lab report will be due.

Required Field Exercise: You will be required to complete one field exercise (Bronx Zoo; American Museum of Natural History; New York Botanical Garden; Queens Botanical Garden; Brooklyn Botanical Garden) on your own time once during the semester in lieu of classroom laboratory activities (see schedule). Rubric for field exercise can be found on class website**. Include photos documenting your experience at your chosen activity.**

<u>Evaluation and Workload</u>: These determine the grade you earn for the course.

Laboratory Exam I:	15%
Laboratory Exam II:	20%
Laboratory Homework and Classwork	40%
Field Trip Report	10%
Lab Report	15%
Course Total:	100%

<u>Grading Scale (%)</u>:

		A	93-100	A-	90-92.9
B+	87.1-89.9	B	83-87	B-	80-82.9
C+	77.1-79.9	C	73-77	C-	70-72.9
D+	67.1-69.9	D	60-67		
		F	0-59.9		

<u>Course Policies:</u> These policies are based on ideas of fairness and respect.

***Grading Policies*:** Final course grades are non-negotiable and will **NOT** be curved or rounded in any way. Grades for individual assignments may or may not be curved depending on the class results. If a curve is instituted, I will determine a fair and reasonable curve which will be applied to each individual's grade.

Grade changes will be made <u>only</u> to correct clerical errors. **Complaints about grades on individual assignments must be submitted in writing within a week following the return of the relevant assignment. Only reasonable and well-justified complaints will be considered**.

Make up exams and late assignments: If you are ill, please do not come to class.

Exams: Exams will be a blend of multiple-choice and short-answer questions, and may involve analysis of a short dataset or graphs/figures. They will be designed to check your broader understanding of concepts covered in the class.

Lab and Field Trip reports: Lab reports will be completed in individually. For the field trip, you can go to your chosen activity as a group if you'd like, **but your field trip reports must also be written and submitted *individually***.

Homework and Classwork: These will usually be the same thing, or close to it. I may have you submit classwork that we don't get to finish as homework, or there may be homework questions related to the classwork assignment that I will have you

turn in, in addition to the activity we complete in class. I will drop the 3 lowest assignments.

Late Work Policy: I will accept late work, but with a 5% deduction for each day past the assignment deadline. This helps me by guaranteeing no last-minute assignment dumps come at the end of the semester and also allows you to evaluate your standing in the class as we move through the semester. Exceptions can be made for serious life disruptions such as illness or loss of a loved one.

Attendance policy: Lab courses are designed as hands-on experiences that cannot be replicated via other learning methods. For this reason, attendance will be taken for each lab section, and attendance is a pre-requisite for turning in lab-related activities.

Disability or crisis issues: Accommodations for the class (extended exam time, reader, etc.) will be handled by the Office of Services for Students with Disabilities. Please contact them directly (Newman Vertical Campus, Room 2-271, 646-312-4590, Disability.Services@Baruch.Cuny.edu) or speak to me regarding contacting them. If a major issue arises during the semester (family death, accident, etc.) please let me, the Departmental office, (920, 17 Lexington Avenue Building) or the Student Affairs office (deanofstudents@baruch.cuny.edu, 646-312-4570) know so efforts can be made to aid you during this time.

At Baruch, we acknowledge that as a student, you are balancing many demands. During the semester, if you start to experience personal difficulties or stressors that are interfering with your academic performance or day to day functioning, please consider seeking free and confidential support at the Baruch College Counseling Center. For more information or to make an appointment, please visit their website at https://studentaffairs.baruch.cuny.edu/counseling/ or call 646-312-2155. If it's outside of business hours (Monday-Friday 9-5pm) and you need immediate assistance, please call 1-888-NYC-WELL (888-692-9355). If you are concerned about one of your classmates, please share that concern by filling out a Campus Intervention Team form at https://studentaffairs.baruch.cuny.edu/campus-intervention-team.

Academic Integrity: I fully support Baruch College's policy on Academic Honesty, which states, in part:

"Academic dishonesty is unacceptable and will not be tolerated. Cheating, forgery, plagiarism and collusion in dishonest acts undermine the college's educational mission and the students' personal and intellectual growth. Baruch students are expected to bear individual responsibility for their work, to learn the rules and definitions that underlie the practice of academic integrity, and to uphold its ideals. Ignorance of the rules is not an acceptable excuse for disobeying them. Any student who attempts to compromise or devalue the academic process will be sanctioned. "

Academic sanctions in this class will range from a D or F on the section or assignment to a D or F in this course and are at my discretion. A report of suspected academic dishonesty

will be sent to the Office of the Dean of Students. Additional information and definitions can be found at https://provost.baruch.cuny.edu/academic-affairs/academic_honesty/

The CUNY University Faculty Senate recommends the following be considered a violation of academic integrity: "unauthorized use of AI-generated content on assignments or examinations unless an instructor for a given course specifically authorizes their use. Some instructors may approve of using generative AI tools in the academic setting for specific goals. However, these tools should be used only with the explicit and clear permission of each individual instructor, and then only in the ways allowed by the instructor." As it stands, **I do not authorize the use of AI for any assignment and will deduct points from each respective assignment if I find you are using AI.**

Personal responsibilities and class etiquette: I understand everyone's time is valuable and that you (or someone) are (is) paying for you to pursue a higher education degree, which marks you as having achieved a goal. In light of this:

- My responsibility and goal is ***to guide students, as active learners, in becoming critical thinkers who can evaluate and assimilate material from across the spectrum of biology and connect it to other disciplines and their everyday life.*** We will accomplish this through class activities, and I will **fairly** evaluate your progress in this area through the methods noted above. I will **respect** your time and effort by attempting to start on time, promptly respond to emails and grade assignments (less than 1 week from receipt), being available for help, and attempting to make class as engaging and relevant as possible. I will regularly seek feedback in these areas through short surveys.
- Your responsibility is to be an active, engaged student who does not detract from class activities. **We will utilize an inverted classroom or discussion-based approach as much as possible, so I expect you to arrive prepared for class.** Please arrive on time and plan to stay ***engaged*** for the entire class. Take part in discussions, ask questions as needed, and stay off personal devices (phones, apps, etc). **Distracting activities will be noted and, if continued, will lead to a dismissal from class. All work you submit in any form must be your own or properly attributed.**

Additional Information: Environmental Sciences at Baruch College

Biological Sciences Major: The Department of Natural Sciences offers a major in biological sciences that allow students to choose from a diversity of courses. Following an introductory series of courses focused on building a firm foundation in the natural sciences (biology, chemistry, physics, genetics) and math, students can choose from a range of elective courses and may focus on courses related to environmental science, ecology, and conservation and sustainability.

Tier III minor in Environmental Sustainability: The Department of Natural Sciences offers a minor in environmental sustainability for students that wish to pursue general intellectual interests or specific career objectives. For example, business students may improve their marketability with knowledge of current issues

in environmental sustainability, and public affairs or pre-law students may gain knowledge for future specialization in environmental law or policy. For the environmental sustainability Tier III minor, students take two environmentally-themed, interdisciplinary courses at the 3000 level or above followed by the capstone course, ENV 4900—Topics in Environmental Science.

The Arts and Sciences Ad Hoc Major in Natural Science Areas: It is also possible to design an ad hoc major that combines ENV courses with additional sciences and courses in other fields. You can see possible paths at https://www.baruchenv.com/courseinfo/ad-hoc-majors. Please inquire for more information.

More information on getting involved in Environmental Science classes and research is available @ https://www.baruchenv.com/

Baruch College Tutoring Services

Tutoring is available free of charge for most Pathways and introductory majors' courses (I and II) at the Student Academic Consulting Center (SACC), located in VC 2-116. You can use the SACC web site to check availability and schedule an appointment: https://www.baruch.cuny.edu/sacc/index.html . To get the most out of tutoring:

1. Start right away. Students who begin tutoring from the beginning of the semester typically do better than those who wait.
2. Book your appointments early. During peak times, you may need to book several days in advance to get the times you want.
3. Come prepared. Please bring your class notes and textbook. Look over the readings and try the problems. If you can, bring a list of specific questions. The more you prepare, the more you will get out of the session.
4. If you miss a class, please get notes from a classmate before your session. Tutoring is not a substitute for attending class.

Course Calendar

Date	Lab Topic
Tuesday, January 27, 2026	Syllabus and Course Overview
Thursday, January 29, 2026	Measurements and Accuracy
Tuesday, February 3, 2026	Climate Data Summaries in NYC
Thursday, February 5, 2026	Phenology and Climate Change with Butterfly Data
Tuesday, February 10, 2026	Population Statistics with Fish Simulations
Thursday, February 12, 2026	**No Official Meeting – Field Trip Day**
Tuesday, February 17, 2026	**COLLEGE CLOSED**
Thursday, February 19, 2026	Adaptations to Introduced Ants with Lizard Data
Tuesday, February 24, 2026	Experimental Design with Bean Beetles, part 1
Thursday, February 26, 2026	Experimental Design with Bean Beetles, part 2
Tuesday, March 3, 2026	Evolution, Drift, and Selection with Beads and Toothpicks
Thursday, March 5, 2026	Mark and Recapture Methods with Tadpole Simulations
Tuesday, March 10, 2026	**Exam Review**
Thursday, March 12, 2026	**MIDTERM EXAM**
Tuesday, March 17, 2026	Comparing Group Differences with Penguin Data
Thursday, March 19, 2026	Demographics and Survivorship with Cemetery Data
Tuesday, March 24, 2026	Modeling Predator-Prey Interactions with Nuts and Bolts, part 1
Thursday, March 26,	Modeling Predator-Prey Interactions with Nuts and Bolts, part 2

2026	
Tuesday, March 31, 2026	Brood Parasitism with Crow Data
Thursday, April 2, 2026	**SPRING RECESS**
Tuesday, April 7, 2026	**SPRING RECESS**
Thursday, April 9, 2026	**SPRING RECESS**
Tuesday, April 14, 2026	Citizen Science
Thursday, April 16, 2026	Plant Competition Experiment, part 1
Tuesday, April 21, 2026	**No Official Meeting – Field Trip Day**
Thursday, April 23, 2026	Species Diversity Metrics with Spider Data
Tuesday, April 28, 2026	Island Biogeography with Ping-pong Balls
Thursday, April 30, 2026	**No Official Meeting – Field Trip Day**
Tuesday, May 5, 2026	Plant Competition Experiment, part 2
Thursday, May 7, 2026	Modeling Wildlife Disease Spread
Tuesday, May 12, 2026	Exploring Nutrient Pollution Using Bioindicators
Thursday, May 14, 2026	Restoration Ecology in NYC
Tuesday, May 19, 2026	**Final Exam Review**
TBD	**FINAL EXAM**