

**New Jersey Institute of Technology**  
**BIOL206 Foundations of Biology: Ecology and Evolution**

**Lab Coordinator:** Dr. Ellen Wisner ([wisner@njit.edu](mailto:wisner@njit.edu))

**Lab Instructor:** Please see course website

**Class Meeting Times:** Tuesday, Wednesday and Thursday 2:30 – 5:30pm

**Class Meeting Location:** Central King Building 328

**Office Hours:** By Appointment

**Description:** This course is the laboratory component of Foundations in Biology: Ecology and Evolution. The labs are designed to complement and elaborate upon concepts learned in the lecture, to give you hands-on experience making observations and gathering data, and to introduce you to common procedures and analyses used in the study of ecology and evolution.

**Prerequisites:** BIOL 200: Concepts in Biology and current registration in BIOL 205.

**Text and course webpage:** There is no textbook for this lab. All lab materials will be posted on the course website. We will use [Moodle](#) in this course. To use Moodle students must have an NJIT UCID. If you are matriculated at NJIT you should already have a UCID. If you are a Rutgers student you can request one here <https://newacct.njit.edu/~accts/cgi-bin/new> or call the NJIT helpdesk for assistance (973-596-2900).

**Lab preparation:** For each lab, a lab handout and a lab worksheet will be posted on the course website. Please read through both of these files thoroughly before coming to lab, and be sure to bring a print-out of BOTH files to each lab. Note that for some labs, you will need to bring handouts and worksheets for two labs. Please **obtain a 3-ring binder** to keep your lab handouts and worksheets organized into a lab notebook.

**Learning outcomes**

- 1.) Explain how laboratory activities illustrate lecture concepts.
- 2.) Use evidence to support scientific conclusions.
- 3.) Research topics using electronic and print sources and attribute sources properly.
- 4.) Design and carry out an experiment to test a scientific question.
- 5.) Analyze and interpret scientific data using a t-test.
- 6.) Communicate scientific results in written format.

**TENTATIVE** Schedule of topics

| DATE     | LABORATORY TOPIC  | ASSIGNMENT DUE  |
|----------|---|---|
| T – 7/7  | Introduction to Lab   |   |
| W – 7/8  | Lab 1: Statistics   |   |
| R – 7/9  | Lab 2: Genetic Change in Model Populations  | Lab 1 Online Assignment Due 2:30pm on 7/9   |
| T – 7/14 | Lab 3: Computer Simulation: Darwinian Snails  | Lab 2 Online Assignment Due 2:30pm on 7/14  |
| W – 7/15 | Lab 4: DNA Extraction and PCR (Part 1)  | Lab 3 Online Assignment Due 2:30pm on 7/15  |
| R – 7/16 | Lab 4: DNA Extraction and PCR (Part 2 - ELECTROPHORESIS)<br>Lab 9: Competition (Part 1) / Begin Plant Experiments |   |
| T – 7/21 | Lab 5: Constructing a Phylogeny (Part 1)<br>Lab 6: How to Write a Lab Report                                      | Lab 4 Online Assignment Due 2:30pm on 7/21  |
| W – 7/22 | Lab 5: Constructing a Phylogeny (Part 2)  | Lab 6 Online Assignment Due 2:30pm on 7/22  |
| R – 7/23 | Lab 7: Human Evolution (Online Field Trip)  | Lab 5 Online Assignment Due 2:30pm on 7/23<br>Lab Report (Part 1) Draft Due 11:59am on 7/25 |
| T – 7/28 | Lab 8: Mark-Recapture   | Lab 7 Online Assignment Due 2:30pm on 7/28  |
| W – 7/29 | Lab 9: Isle Royal<br>Lab 10: Competition (Part 2)   | Lab 8 Online Assignment Due 2:30pm on 7/29  |
| R – 7/30 | Lab 10: Competition (Part 3)/ End Plant Experiments   | Lab 9 Online Assignment Due 2:30pm on 7/30<br>Lab Report (Part 2) Draft Due 11:59am on 8/1  |
| T – 8/4  | Lab 11: Island Biogeography   | Lab 10 Online Assignment Due 2:30pm on 8/4  |
| W – 8/5  | Lab 12: Ecological Footprint  | Lab 11 Online Assignment Due 2:30pm on 8/5  |
| R – 8/6  | NO LAB  | Final Lab Report Due<br>Lab 12 Online Assignment Due 2:30pm on 8/6                          |

**Lab Safety:**

General safety precautions:

- **No eating or drinking in the lab.**
  - Wear closed-toed shoes to lab.
  - Follow the directions for lab procedures and ask your TA if you're unsure about how to operate any equipment.
  - Keep an organized workspace and label all materials.
  - Your lab handouts and your TA will alert you to safety concerns specific to a particular lab.
- NOTE:** You should notify your TA immediately of any injuries, spills, or broken equipment.

**Course grade:** Your grade for lab will be determined based on quizzes, online assignments, and one written lab report:

- ★ **Quizzes:** You will begin each lab with a quiz. Students arriving late to lab will not be permitted to take the quiz. Make sure you read the lab handout before coming to lab so you're prepared! The quizzes will focus on the current week's lab and will also include some review from previous weeks. There will be 12 quizzes during the course, your top 11 quizzes will be counted towards your final grade.
- ★ **Assignments:** Each week, complete the worksheet that accompanies your lab handout. Some of it will be completed during the lab; often, there are analyses or interpretive questions that you'll need to complete on your own time. You should complete the worksheets for each lab and keep them in your lab binder. Refer to your completed worksheet to complete each lab's moodle assignment. The due dates for each moodle assignment are listed on the course schedule. Please note that while you usually work in groups during the lab and will share data and discuss results with your group, all work submitted for a grade, including moodle assignments and written work, must be your own work. There are 12 online assignments, your lowest online assignment grade will not be counted towards your final grade.
- ★ **Lab Report:** You will design a plant experiment and report the results in a full lab report in the style of a scientific publication. Failure to turn in either section of the draft will result in a loss of 25 points.

| POINT BREAKDOWN |                   |                   |
|-----------------|-------------------|-------------------|
| Quizzes:        | 10 pts per week = | 110 points        |
| Assignments:    | 25 pts per lab =  | 275 points        |
| Lab Report:     | =                 | 100 points        |
| <b>Total</b>    | <b>=</b>          | <b>485 Points</b> |

| GRADING SCALE |          |   |          |
|---------------|----------|---|----------|
| A             | 90-100%  | C | 70 - 77% |
| B+            | 87 - 90% | D | 60 - 70% |
| B             | 80 - 87% | F | 0 - 60%  |
| C+            | 77 - 80% |   |          |

- ★ **Attendance, Make-Up, and Lateness Policy:** Attendance at every lab is **required** and necessary to earn a good grade in lab. If you miss a lab (even for an excused reason), it will count as your dropped quiz & lab grade. Please contact the TA as soon as possible so that you can be prepared for the next lab. If you miss more than one lab for valid reasons, bring proper documentation (doctor's or dean's note) to Dr. Wisner.
- ★ **Academic Dishonesty:** The course has a zero tolerance policy for academic dishonesty, including plagiarism and cheating. Instances of dishonesty will be punished by a zero on the assignment and consultation with the office of the Dean of Students to determine if further action is required. If you have any questions about what constitutes plagiarism or cheating, please ask your TA or refer to the academic integrity code [NJIT Academic Integrity Code](#).