

Fall 2023

BIOL 621-001: Ecology

Phillip Barden

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BIOL621 Ecology

Instructor & coordinator: Dr. Phillip Barden

E-mail: barden@njit.edu

Additional instructors: Drs. Bunker, Holzapfel, Russell (contact info below)

Office: CKB 428B

Office Hours: Monday, Wednesday: 11:00-4:00pm; by appointment

Course Website: <http://canvas.njit.edu>

Course Schedule: Mon, Weds 11:30-12:50pm

Course Location: CKB 315

Course description: Ecological patterns and processes shape global biodiversity. From the community of microbes under your fingernail to entire continents and the planet, the field of ecology seeks to understand complex interactions among biological species and the environment. These themes are increasingly important; humans are reliant on functioning ecosystems even as anthropogenic factors alter our planet in profound ways. This course introduces graduate students to ecology at multiple conceptual and geographic scales. Covered topics will include:

- Autecology: What are the determinants of organismal and environmental interactions?
- Population Ecology. What determines the abundance, dispersion, age structure, and dynamics of biological populations?
- Species Interactions. What is the nature of species interactions such as competition, predation, parasitism, and mutualism? How do these interactions influence distribution and abundance?
- Community Ecology. What determines the structure, organization, and dynamics of groups of coexisting species?
- Ecosystem Ecology. How do materials and energy move through the biotic and abiotic components of ecosystems? How do organisms and abiotic factors influence the structure and function of ecosystems?
- Applied ecology. How do we apply ecological principles to problems such as conservation biology, global change, and sustainability?

Learning objectives

This course will introduce students to topics in ecology and to the scientific method as applied to ecological research. Students will:

- Learn how to understand and evaluate scientific publications;
- Learn how to ask ecological questions, formulate hypotheses, generate predictions, design and conduct experiments, and interpret data;
- Gain an understanding of the structure of knowledge in ecology, biology, and the natural sciences in general;
- Gain in-depth understanding of foundational and contemporary topics in ecological research.

Prerequisites: None

Required Materials: None.

Instructors: This course is co-taught by Drs. Phil Barden (NJIT), Dan Bunker (NJIT), Claus Holzapfel (Rutgers-Newark), and Gareth Russell (NJIT). Because ecology is a rich and complex field, each faculty member will contribute their own unique expertise by leading classes throughout the semester. You will find a schedule detailing instructor dates below.

Barden, Course coordinator

Office hours: Monday, Wednesday: 3:00-4:00pm; by appointment

Office location: Online; 973-596-5863; barden@njit.edu

Bunker

Office hours: Tuesday 3-4 pm; by appointment

Office location: Online; 973-642-7537; dbunker@njit.edu

Holzapfel

Office hours: Thursday 10-12; by appointment

Office location: Online; 973-353-5385; holzapfe@rutgers.edu

Russell

Office hours: Monday and Wednesday 11:30-12:30; by appointment

Office location: Online; 973-596-6412; gareth.j.russell@njit.edu

Grading Policy: The course is team taught by Profs. Barden, Bunker, Holzapfel, and Russell. Each faculty member will grade you on 25% of the course, with their own grading schema.

Barden: Paper presentations, notes, class glossary	25%
Bunker: Hypotheses assignments, participation	25%
Holzapfel: TBD	25%
Russell: TBD	25%

Grading Scale	
A	90 – 100
B+	85 – 90
B	80 – 85
C+	75 – 80
C	70 – 75
D	60 – 70
F	0 – 60

Attendance & Participation: As a graduate student we expect that you will be fully engaged in this course and your graduate work in general. Failure to attend class and participate fully may result in failure in the class.

Assignments: This course will cover a good amount of material and will move quickly. Reading assignments will be posted on Canvas and/or disseminated via email. It is your responsibility to read all assigned materials before class meets and be fully prepared to discuss in class. Assignments will be made by individual instructors and will be due when stated via email and Canvas.

In-person course format: This course will run face-to-face, meaning we will all meet during our scheduled class time Mon/Weds, 11:30am-12:50pm in Central King Building room 315.

Academic integrity: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. You may access the academic code of integrity policy here: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

Canvas: We will be using Canvas for our class website (<http://canvas.njit.edu>). To use Canvas 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 may already have one. You can check by following the directions here: <https://ist.njit.edu/ucid/>. If you do not have one you can request one at the same page or call the NJIT helpdesk for assistance (973 596 2900).

Key Dates:

Sept. 5: First day of classes

Sept. 11: Last day to add/drop a class.

Sept. 18: Last day to withdraw with 90% refund

Nov. 13: Last day to withdraw.

Dec. 13: Last day of classes.



BIOL621 Course Syllabus – Fall 2023

Week	Dates	Instructor	Topic	Assignment
1	Weds, Sept 6	Barden	<i>Introduction – Core terms and concepts – Survey of major subfields of ecology</i>	Read the syllabus
2	Mon, Sept 11 Weds, Sept 13	Barden	<i>Distribution of life on earth: biomass, diversity, and carbon</i>	By Friday Sept 8 at 12pm: Draft of powerpoint, paper notes
3	Mon, Sept 18 Weds, Sept 20	Barden	<i>Evolutionary ecology: ecomorphology, adaptive radiations, and extinction</i>	See Canvas
4	Mon, Sept 25 Weds Sept 27	Barden	<i>Diversity and inclusion in Ecology</i>	See Canvas
5	Mon, Oct 2 Weds, Oct 4	Barden	<i>Behavioral Ecology</i>	See Canvas
6	Mon, Oct 9 Weds, Oct 11	Barden	<i>Behavioral Ecology II</i>	See Canvas
7	Mon, Oct 16 Weds, Oct 18	Barden	<i>Tastemaking</i>	See Canvas
8	Mon, Oct 23 Weds, Oct 25	Holzapfel	<i>Community Assembly</i>	See Canvas
9	Mon, Oct 30 Weds, Nov 1	Holzapfel	<i>Interactions (competition, predation, mutualism, etc)</i>	See Canvas
10	Mon, Nov 6 Weds, Nov 8	Holzapfel	<i>Multitrophic communities</i>	See Canvas
11	Mon, Nov 13 Weds, Nov 15	Russell	<i>Population Dynamics in Time and Space</i>	See Canvas
12	Mon, Nov 20	Russell	<i>Landscape Ecology</i>	See Canvas
13	Mon, Nov 27 Weds, Nov 29	Russell	<i>Conservation as Applied Ecology</i>	See Canvas
14	Mon, Dec 4 Weds, Dec 6	Bunker	<i>Niches, Communities, & Biodiveristy</i>	See Canvas
15	Mon, Dec 11 Weds, Dec 13	Bunker	<i>Niches, Communities, & Biodiveristy</i>	See Canvas

*Course schedule is tentative and subject to change. Please see Canvas for updates, reading assignments, and online meeting place information.