

Fall 2023

BIOL 205-001, Foundations of Biology: Ecology and Evolution

Caroline DeVan

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Biology 205: Foundations of Biology - Ecology and Evolution, FALL 2023, Section 001

Lectures: Monday & Wednesday – 11:30am – 12:50pm; CKB G-08

Pre-requisite: Concepts of Biology (BIOLOGY 200)

Co-requisite: Foundations of Ecology and Evolution Laboratory (BIOLOGY 206)

Instructor: Dr. Caroline DeVan (Preferred pronouns: She/Her/Hers)

Email: caroline.m.devan@njit.edu,

Office phone: 973-596-5404 (if Bio Office is closed, dial 5404 from courtesy phone by elevator)

Office: NJIT CKB 340F - in the NJIT Biology Office suite

Office Hours: Monday 3:00pm – 4:30pm; Tuesday 10am – 11:30am and by appointment - in office or online via zoom (links posted to canvas)

Emergency Phone: 973-596-3111 – Public Safety (Non-emergency: 973-596-3120)

NJIT Campus Map: www.njit.edu/about/visit/njit-maps.php

Course Description: *Why should you want to study Ecology and Evolution?* Ecology and evolutionary biology are fundamental to our understanding of how life on earth functions. This course focuses on understanding the major principles in these fields and on how ecology and evolution affect *all* life on earth. Throughout the class, we will use current examples to see how evolution and ecology affect our everyday lives.

Course Goal: Students will understand how the major principles of Ecology and Evolution determine the functioning of all life on earth.

Course-Level Learning Outcomes:

By the end of this course, students are able to:

1. Design an experiment and use statistics to test whether there is a significant difference between two treatment groups.
2. Explain how biological variation is produced and maintained.
3. Explain the mechanisms that lead to evolution within a population and the formation of new species.
4. Analyze a phylogenetic tree, and explain how organisms are related to each other based on this tree.
5. Describe the basic series of events that occurred during the evolutionary history of life.
6. Explain and predict how a population will change in size over time.
7. Assess the importance of a given species interaction and hypothesize how it may have evolved.
8. Describe how energy flows through a community and explain how species influence community structure.
9. Predict how changes to biogeochemical processes may change ecosystems.
10. Describe how humans affect biodiversity and why biodiversity is important.
11. Outline how the environment affects species and species distribution.
12. Justify why the study of ecology and evolution is important to people.

Required Course Materials:

- **Textbook:** We will use the FREE online textbook Open Stax Biology 2e: <https://openstax.org/details/biology-2e>, supplemented with additional readings. All readings will be provided via links on the course website, but I recommend you download the (free) OpenStax Biology 2e text. All additional materials will be added to the course website.
- **iClicker:** An iClicker is required for this course. I use iClickers to determine participation and attendance (see Course Assessments below). The **iClicker REEF** app is required for this course. Go to this link to subscribe for the app: <http://iclicker2.wpengine.com/students/apps-and-remotes/apps>. You can also use an iClicker remote, but you must register it for this class.
- **Website:** <http://canvas.njit.edu/>, login with your NJIT UCID. **Canvas will automatically assign your email as your NJIT e-mail address and this will be where all messages sent through Canvas will go.** You can try to change your contact information on Canvas, but you should also make sure you forward your NJIT email to your preferred email (directions on Canvas).
- **Technology Requirements:** You may sometimes need a laptop or tablet for class work. You will also need access to Microsoft Office Suite (or similar) for data analysis. NJIT provides free access to students - <http://ist.njit.edu/software-available-download/>.
- **Note-taking Materials:** You should bring materials to take notes to every class meeting. Handwriting notes is recommended.

Communication with instructor

- **In-person communication during class and office hours and Canvas message app are the preferred forms of communication.** If you do talk to me before/during/after class asking me to do a task, please send a follow-up email through the Canvas message app. You can email me directly as well, but I may respond more slowly. When emailing me through the Canvas app or directly please indicate your full name and the course you are in as part of the email subject line. I will be checking the Canvas messaging app and my email regularly throughout the work week during normal business hours. Outside of these times I will respond to messages and emails as soon as possible, but do not expect an immediate reply.
- **Office hours:** Office hours are open times when you can come discuss with me any questions or concerns you have about the course or course material. Office hours will be held each week at the regularly scheduled times. You can visit my office or attend via zoom – use the Office Hours zoom links posted to canvas. You DO NOT need an appointment to attend office hours. If you are attending online you may need to get my attention when you show up so I know you are there. You should also make sure when you sign in that it displays your full name so I know who I meeting with.
- **Appointments:** I am always happy to make an appointment with a student. Ideally appointments should be made in advance. To schedule an appointment, you should message me through the Canvas app – be sure to include your name, the class you are in, and the times you are available to meet in your message. Appointments can be in person or via Zoom – please indicate your preference.

Grades and Assessments:

Course Grade: Grades will be determined by the percentage of the total possible points earned, following the standard grade scale to the right. Grades are not curved. No individual extra credit opportunities will be available, but an extra credit assignment may be available for the whole class.

Your grade for this course will be based on the components in the table below. You can choose some aspects of how your grade is calculated by determining the weight of each component as a percentage of your total semester grade, within the given ranges. Your final grade will be the highest of the two possible grades: the grade that results from your selected weight (your %) or the one resulting from the standard weight (standard %). You will select your % in the middle of the semester. This process should help you assess your strengths and weaknesses in the course and determine a strong course of action for the remainder of the semester. Standard calculations for each assessment are described below and will be posted to Canvas so you can keep track of your progress in the course.

Grades	% Range	Standard %	Your %
<i>Participation & In-Class Group Work (15 pts)</i>	3-7%	5%	
<i>Learning Journals (10 pts) – 10 required, 1 pt each</i>	2-4%	3.3%	
<i>Quizzes (50 pts) – 10 quizzes, 5 pts each</i>	14-19%	16.7%	
<i>Homework & Focal Organism Poster (50 pts)</i>	14-19%	16.7%	
<i>Midterm Exams (100 pts) – 2 exams, 50 pts each</i>	28-38%	33.3%	
<i>Final Exam (75 pts) - Cumulative</i>	20-30%	25%	
<i>Total (300 pts)</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>

Modes of Assessment:

- **Participation.** Participation points are earned during class by answering iClicker questions (some must be answered correctly, but not all), completing in-class assignments, and participation in class discussions. There will be approximately 3-7 iClicker questions per synchronous lecture. If you gain 80% of the available clicker points you will receive full credit (15 points). This cut-off will compensate for ~3 missed classes or should you experience technological issues.
- **Learning Journals.** You will complete at least approximately one learning journal assignment per week (1 point each, 10 required).

Letter Grade	Percentage
A	90 – 100
B+	85 – 90
B	80 – 85
C+	75 – 80
C	70 – 75
D	60 – 70
F	0 – 60

These journals will give you an opportunity to assess your learning and improve your metacognition skills. You may be asked to submit your notes and/or answer a prompt each week.

- *Quizzes (Mastery Assessments)*. You will complete a mastery assessment (quiz format) (5 points each), approximately 1 per week. These “quizzes” are to assess your understanding of concepts that we have covered in class and through the required materials and your ability to apply that knowledge. These are intended to provide practice as part of your preparation for exams and to give you an opportunity to mark your progress. You will have 2 attempts for each quiz. These assessments will typically be due on Monday nights except for weeks when you have an exam. These assessments will be administered through Canvas and will be open notes, open book. However, they must be done independently without help from other people and unauthorized sources. They will be based on the previous week’s course content and any assigned required materials (e.g., readings, podcasts, and videos) to prepare you for the next week. ***You should plan to spend ~ 80 minutes outside of class preparing for these quizzes each week.*** Quizzes cannot be completed late. Your lowest quiz score will be dropped.
- *Exams*. There will be two midterm exams during the semester, each worth 50 points. Each exam will primarily focus on a specific unit of material but each consecutive exam will build on knowledge from previous units. The final exam will be worth 100 points and will be during the final exam period. Further details about exams will be communicated with you in advance in class and through emails. Details will also be posted to Canvas.
- *Homework*. Early in the semester you will choose a focal organism. Throughout the semester you will complete assignments that will require you to do some research on your focal organism and share it with your classmates. Other assignments will follow up on in-class work or prepare you for your exam. The focal organism assignments will culminate in a poster that considers the effects of climate change on your species and its ecosystem. Details will also be posted to Canvas.
- ***Make Up Exams & Late Work:*** Late work is accepted with a 10% deduction per day. Late submissions (up to 10 days late) of journals will receive half credit. Exams can only be made up with documentation of an excusable absence from the [Office of the Dean of Students \(DOS\)](#). Quizzes cannot be completed late, but can be excused with documentation from the DOS.

Course Policies:

This course is offered in the Face-to-Face Instructional Delivery Mode. All students are expected to follow NJIT's COVID-19 guidelines: please see NJIT's Pandemic Recovery Plan for more information and updates: <https://www.njit.edu/pandemicrecovery/>.

- **Sharing Materials:** All course materials (including recordings of lectures) are for students' own use only (no sharing or posting anywhere). See the NJIT Policy for Recording Classes (<https://www.njit.edu/provost/policies-procedures>).
- **Technology policy:** Cell phones and computers are allowed in the classroom to facilitate note-taking and for use with clickers but all ringtones should be silenced. Everyone should refrain from using your devices for non-class related purposes. If they become a distraction you will be asked to put them away. To minimize distractions, I recommend turning off all notifications or using airplane mode while in class. If you must answer a phone call, step outside the classroom or mute yourself *before* answering.
- **Academic Dishonesty:** 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 that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. 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.

Student Services and Inclusion Statement

NJIT Biology Tutoring Center: In person and online tutoring is available, details can be found: <https://biology.njit.edu/newsroll/biology-tutoring-center>

Accessibility Statement: If you are in need of accommodations due to a disability please contact the Office of Accessibility Resources & Services (OARS), to discuss your specific needs: <https://www.njit.edu/accessibility/> and then please let me know about any required accommodations.

NJIT Non-discrimination Policy New Jersey Institute of Technology reaffirms its commitment to a policy of non-discrimination on the basis of race, sex, sexual orientation, age, religion, ethnic origin, handicap or veterans' status in its employment policies, educational programs and activities under university control.

In this course, each person in the class is an integral part of the course and has something of value to contribute. I strive to promote an inclusive environment in my class and I expect all participants in the class to be respectful of others' perspectives and opinions whenever engaging in the course.

Mental, emotional and physical health can have a large impact on learning and so I also strongly encourage students to utilize all campus resources as needed. I am here to help facilitate your learning and so please let me know about course concerns as soon as possible so I can help resolve them.

Please see the last page of this syllabus for student support services available at NJIT.

HOW TO SUCCEED IN FOUNDATIONS OF ECOLOGY AND EVOLUTION:

Below is advice from real students who recently took the class. All are direct quotes on how to succeed in this course. Note: this advice came from students who took the course in-person pre-COVID-19 pandemic.

- “MOST IMPORTANT, GO TO CLASS. The main key to success in the class is to go to class and listen carefully to the lectures.”
- “You have to engage. Your physical presence in a seat does not count as engagement. . .Don't just sit there, ask questions, answer questions, speak to your neighbors, fill out the worksheets. The more you engage and participate, the less you have to study.”
- “What I think made me successful in Bio 205 was taking advantage of all of the resources available such as the office hours and all of the study guides and resources put up on canvas such as the assignment and homework because it really does help enforce the material and will help you when the exams come around.”
- “I think what made me successful was always skimming through what we were going to learn about in lecture that day before class. Then coming to class and paying full attention in class & taking rough notes. Then after class I would read the book and rewrite my notes after.”
- “When I would prepare for the exams for this class or any class I would study it as if I had to go in the lecture the next time and teach this material. By doing this it helped me to apply the concepts rather than just having to do a very monotonous memorization.”
- “I read the textbook material before going to the class and also looked over the power points. I would then make list of questions that I would have from my readings and the questions that may have arose from the previous lectures. After that I would go to Dr. Devan's office hours to get further insight into the material.”
- “GO TO OFFICE HOURS! If you do not understand a concept, there is a high chance that you will not understand it if you do not ask for help, so please go to office hours.”
- Advice from Dr. DeVan – “When studying for an exam – use the learning objectives and concept maps to organize and frame the material. Think of how the examples from class illustrate the concepts, don't just memorize the examples. You should also test yourself – ask yourself questions about the material and then ask me if you need to!”

For more advice and information on how to best succeed in this course, please see the Canvas section titled “Study Support” where more advice is posted and there are many different resources and tips to increase your learning! You can also talk with me directly. **I am here to help and I am looking forward to working with you!**

WEEK #	DATE	MEETING TOPIC & LEARNING OUTCOMES*	ASSIGNMENTS**
1	W – 9/6	Course & Content Introduction	Choose Focal Organism
2	M – 9/11	Pretest, Scientific Method & Review of Graphs, Stats (L.O. 1)	Quiz 1
	W – 9/13	What is Life? Biodiversity, Climate & Biomes (L.O. 2, 10 & 11)	Focal Organism HW 1
3	M – 9/18	Population Ecology: Growth & Dynamics (L.O. 6)	Quiz 2
	W – 9/20	Population Ecology: Population Regulation (L.O. 6-8)	Focal Organism HW 2
4	M – 9/25	Metapopulations & Interactions (L.O. 6-8)	Quiz 3
	W – 9/27	Community Ecology: Competition & Niches (L.O. 7)	Focal Organism HW 3
5	M – 10/2	Community Ecology: Predation & Energy Flow (L.O. 7 & 8)	Quiz 4
	W – 10/4	Community Ecology: Indirect Ecological Interactions (L.O. 7 & 8)	
6	M – 10/9	Disease Ecology (L.O. 6-8, 10 & 12)	Focal Organism HW 4
	W – 10/11	Exam 1 (Covers Material from Weeks 1-5)	
7	M – 10/16	Ecology: Ecosystems (L.O. 7 & 8)	Quiz 5
	W – 10/18	Ecology: Biogeochemical Cycling (Carbon Cycle) (L.O. 9)	Focal Organism HW 5
8	M – 10/23	Ecology: Climate Change (L.O. 5, 9 & 12)	Quiz 6
	W – 10/25	Evolution: Intro to Evolution, Pop Genetics (L.O. 2)	
10	M – 10/30	Evolution: Mutation, Natural Selection I (L.O. 1-3)	Quiz 7
	W – 11/1	Evolution: Natural Selection II (L.O. 2 & 3)	Focal Organism Poster due Sun 3/26
11	M – 11/6	Focal Organism Presentations – Attendance Mandatory	Quiz 8
	W – 11/8	Evolution: Sexual Selection (L.O. 3)	Focal Organism HW 6
12	M – 11/13	Evolution: Adaptations, Life History & Coevolution (L.O. 2, 3 & 7)	Quiz 9
	W – 11/15	Evolution: Genetic Drift & Gene Flow (L.O. 2 & 3)	
13	M – 11/20	History of Life & Human Evolution (L.O. 9, 10 & 12)	
	W – 11/22	NO CLASS – Thanksgiving	
14	M – 11/27	Exam 2 (Covers Material from Weeks 6-12)	Quiz 10
	W – 11/29	Evolution: Speciation I (L.O. 3)	
15	M – 12/4	Evolution: Speciation II (L.O. 3)	Quiz 11
	W – 12/6	Evolution: Phylogeny (L. O. 4)	Focal Organism HW 7
16	M – 12/11	Evolution: Phylogeny II (L. O. 4)	Focal Organism HW 8
	W – 12/13	Biogeography, Biodiversity & Conservation Biology (L.O. 9 & 11)	
17	12/17 – 12/23	Cumulative Final Exam ***	

The above schedule is tentative and may change, changes will be posted to Canvas.

* The Learning Outcomes (L.O.) refer to the Course-Level Learning Outcomes listed in the syllabus.

** All weekly assignments, learning journals and quizzes (mastery assessments) will be due by 11:59pm Sundays; no quizzes the week before an exam

*** Final Exam will be during the final exam period which is Dec 17-23. Do not make travel plans until the final exam schedule is posted. The final exam schedule will be posted here:

<http://www.njit.edu/registrar/exams/>

Your classroom as well as your college experience is meant to be a place where the free flow of ideas is encouraged and nurtured. It is not acceptable for any community member to make hurtful and demeaning remarks, or otherwise disrupt your learning experiences or your safety. As such, there are many NJIT support systems and policies of which you should be aware.

<p>Basic Needs</p> <p>Students who face challenges securing their food or a safe and stable place to stay are urged to contact the Dean of Students (dos@njit.edu). If you are comfortable doing so, please notify me as well.</p> <p><u>Food Insecurity</u>: If you are experiencing food insecurity, there is a food pantry on campus for your convenience (You must bring your UCID). Campus Center, Room 478 foodpantry@njit.edu See website for updated hours: https://www.njit.edu/foodpantry/hours-and-general-information</p>	<p>Emergency Support</p> <p><u>Crises Happen</u>: If you experience a life emergency and are unsure which support services to turn to, NJIT Public Safety can connect you to emergency support systems - call 973.596.3111.</p> <p>For medical, psychological or psychiatric emergencies you can also call: University Hospital Crisis 973.623.2323</p> <p>If you want to report a concern about another students' well-being you can also reach out to the NJIT CARE Team (https://www.njit.edu/care/) or the Dean of Students Office.</p>	<p>Mental Health and Stress Management</p> <p>Center for Counseling and Psychological Services (C-CAPS) is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. https://www.njit.edu/counseling/gethelp</p> <p>Diminished mental health, including significant stress, mood changes, excessive worry, or problems with eating and/or sleeping can interfere with optimal academic performance. The source of symptoms might be related to your course work; if so, please speak with me. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute to decreased academic performance. Please seek out help as needed.</p> <p>Campbell Hall, Room 205 (Main Level) 973.596.3414</p>
<p>Student Parents</p> <p>If circumstances arise that necessitate your absence from class - such as the illness of a child, closing of day care for inclement weather, etc. - please contact me as soon as possible so we may make arrangements to keep you up-to-date with course material and activities. If you should need any other kind of assistance for circumstances relating to your status as a student and parent, please consider contacting the Dean of Students and Campus Life at 973.596.3466 for a referral to appropriate services including on and off campus support.</p>	<p>Consensual, Healthy Personal & Professional Relationships</p> <p>Your body is your own and NJIT strives to protect its community members from any unwanted advances. Title IX prohibits discrimination based on sex, including harassment, domestic and dating violence, sexual assault, and stalking. Sexual violence undermines students' academic success. Anyone dealing with sexual misconduct should consider talking to someone about their experience, so he/she/they can get the support needed.</p> <p>Confidential Resource:</p> <ul style="list-style-type: none"> • <u>Center for Counseling and Psychological Services (C-CAPS)</u> Campbell Hall, Room 205 (Main Level) 973.596.3414 <p>Non-Confidential Resources:</p> <ul style="list-style-type: none"> • <u>NJIT Public Safety</u> 973.596.3111 • <u>Dean of Students Office</u>, 255 Campus Center 973.596.3466 	<p>Special Accommodations</p> <p>If you have a disability or a personal circumstance that will affect your learning in this course, please let me know as soon as possible so that we can discuss the best ways to meet your needs. Any student who needs accommodation for disabilities should also contact the Office of Accessibility Resources and Services (OARS): https://www.njit.edu/studentssuccess/accessibility</p> <p>Kupfrian Hall, Room 201973.596.5417 oars@njit.edu</p> <p>Religious/Cultural Observance Students who have religious or cultural observances that coincide with this class should let me know by email within the first two weeks of class. I strongly encourage you to honor your cultural and religious holidays! However, if I do not hear from you within the first two weeks, I will assume that you plan to attend all class meetings.</p> <p>Supporting Academic Integrity Our community functions best when its members treat one another with honesty, fairness, respect, and trust. The college promotes the assumption of personal responsibility and integrity, and prohibits all forms of academic dishonesty and misconduct.</p> <p>Issues of Concern (Non-Emergency)</p> <p>Alert the Dean of Students Office (dos@njit.edu) about issues of concern, including academic and non-academic violations (https://www5.njit.edu/doss/reporting/).</p>