

Fall 2018

BIOL 205-005: Foundations of Biology: Ecology and Evolution

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BIOLOGY 205-005: FOUNDATIONS OF BIOLOGY: ECOLOGY AND EVOLUTION

INSTRUCTOR:	Dr. Phillip Barden	EMAIL:	barden@njit.edu
OFFICE:	428B Central King Bldg.	OFFICE HOURS:	Tues. 2:30PM- 3:30PM & Thurs. 1:00PM- 2:30PM please meet in CKB 337
PHONE:	973-596-5863		
COURSE SCHEDULE:	T & R: 11:30 AM- 12:50PM	COURSE WEBSITE:	http://moodle.njit.edu
COURSE LOCATION:	CKB G08		

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.

PREREQUISITES: Concepts in Biology (BIOL 200)

CO-REQUISITE: Foundations of Ecology and Evolution Laboratory (BIOL 206).

Course Website: [Moodle](http://moodle.njit.edu), login with your NJIT UCID. If you are a Rutgers student, you will need an NJIT UCID to get access to the site. If you do not already have one, you can request one at http://moodle.njit.edu/rutgers_students.php. **Everyone: please be sure that you have gone into your profile and changed your preferred e-mail to an account you check regularly.** You will automatically be assigned an NJIT e-mail address and this will be the default unless you change it. We will also be using Piazza (link below or via Moodle) as a course question forum.

Piazza: This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates and your instructors. Rather than emailing general course questions to your instructor, you should post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com. Questions of a personal nature should still be directed to your instructor at the email above.

Find our class page at: <http://piazza.com/njit/fall2018/bio205>. There will also be a link on Moodle.

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COURSE OBJECTIVES:

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 why 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 MATERIALS:

- CP NJIT BIO How Life Works & LP Access Card. ISBN: 1-4641-7316-8. This is a custom textbook meaning that it only includes selected chapters from a larger textbook. This textbook will be the starting point for all class materials and we will add additional materials to the course website. It can be purchased at the NJIT bookstore and comes with both a paperback edition and an online version of the text. There are other options for purchasing the text: You can purchase an online version here: <http://www.macmillanhighered.com/launchpad/morris1e/9046926>. Or you can purchase a non-custom version as well. The non-custom version that contains the same material is: Biology: How Life Works Volume 2 (ISBN-13: 978-1464104282).
- An **iClicker (I,II, Plus or REEF Polling (iClicker App))** is required for this course. Due to the large size of this class, we use iClickers to determine participation and attendance for every class.

Instructor Information:

Any general course questions should be posted to **Piazza**. Other questions can be emailed to me – I will answer emails received on week days (those sent between 8am Monday and 5pm Friday) within 24 hours. Emails received on the weekend (after 5pm on Friday or before 8am on Monday) will be answered within approximately 48 hours. Appointments can be made by going to: <https://cmd26.youcanbook.me/> and scheduling an appointment. Appointments should be made 24 hours in advance.

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GRADING POLICY & SCALE: Grades will be determined by performance on exams, quizzes, and class participation. Grades will be determined by the percentage of the possible points earned, following the standard grade scale below. Grades are not curved and do not ask for extra credit. Your grades will be posted to Moodle so you can keep track of your progress in the course.

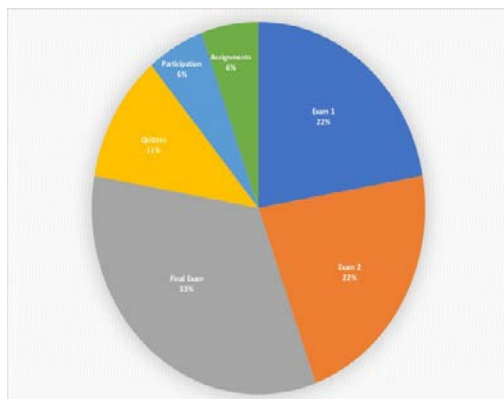
Assignments	Points
Quizzes (25 pts each)	50 points
Class participation & Assignments	50 points
Exam 1	100 points
Exam 2	100 points
Final Exam	150 points
Total	450 points

Letter Grade	Percentage
A	90 – 100
B+	85 – 90
B	80 – 85
C+	75 – 80
C	65 – 75
D	50 – 65
F	0 - 50

Modes of Assessment:

Exams: There will be three exams, the first two exams will be worth 100 points each, and the final exam will be cumulative and worth 150 points.

Quizzes: There will be three in-class quizzes that will be worth 25 points each and the lowest quiz grade will be dropped.



PARTICIPATION & ASSIGNMENTS: Participation points are earned by answering iClicker questions (some must be answered correctly, but not all), completing online Moodle assignments (there will be approximately one per week with deadlines noted on Moodle), and in-class assignments.

NOTE: There will be 3-7 iClicker questions per lecture. *Bringing someone else's clicker to class is cheating.* If you are caught clicking in for someone else, both people involved will lose ALL of their clicker points. You will be able to miss up to 3 classes (for any reason – excused or unexcused) without losing participation points. (See Calculating Participation Points below).

Calculating Participation & Assignment Points: To determine how many participation points you have, first figure out the total number of *in-class participation* points that were available, then calculate the percentage of these that you earned and multiply the result by 50. For instance, if by the end of the semester a total of 150 possible participation points were made available and you earned 125 of them, then you have 42 of the possible 50 in your final grade; $(125/150) * 50 = 41.66$ participation points. I will post the grades for participation points three times during the year on 10/9, 11/13, and 12/12. Each time I post them, I will give you 10 extra points, allowing you to miss up to 3 classes (for excused or unexcused reasons) without losing any points.

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MAKE UP EXAMS AND QUIZZES: Make up exams will be possible with a doctor's or a dean's letter or with prior approval. If you do miss an exam, make sure to contact me within two days of the missed exam. Because the lowest of your three quizzes gets dropped, you will not be able to take a makeup quiz. Instead, your missed quiz will count as the dropped quiz.

ELECTRONICS / CELL PHONE POLICY: The use of cell phones is not allowed in class. Please silence your cell phones during class.

ACADEMIC INTEGRITY: There is zero tolerance for academic dishonesty in this course which includes both cheating and plagiarism. The punishment for dishonesty in this course will be a zero on the assignment and a consultation with the Dean of Students after which further action may be required. Please ask us if you have any questions. The University's academic integrity policy can be found [here](#).

Accommodations: Please let me know if you require accommodations for a disability or if you have any concerns about the course as soon as possible so that I can work with you to resolve them. I am here to help!

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.*

"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 Moodle such as the assignment and homework because it really does help enforce the material and will help you when the exams come around."

"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 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."

"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."

For more advice and information on how to best succeed in this course, please see the Moodle section titled "Metacognition" where more advice is posted and there are many different resources and tips to increase learning! You can also talk with me directly.

I am here to help and I am looking forward to working with you! ~Prof. DeVan

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COURSE OUTLINE: ***TENTATIVE SCHEDULE:** The final exam WILL be held during the final exam period listed below. DO NOT make arrangements to leave town prior to this, as taking the exam early will NOT be an option.*

DATE	LECTURE TOPIC	READING AND/OR ASSIGNMENT
T - 9/4	Course & Content Introduction	Syllabus
R - 9/6	Pretest & Scientific Method	Sections 1.1 - 1.3; Statistics Primer
T - 9/11	Statistics & Mini-Genetics Review	Online Genetics Primer
R - 9/13	History of Life	Case Study 1 (First Cell); Sections 23.3 - 23.4, Fig. 44.39
T - 9/18	Origin of Genetic Variation & Population Genetics	Sections 21.1 - 21.2
R - 9/20	<i>Quiz 1</i> ; Introduction to Evolution	Sections 1.4; 21.3
T - 9/25	Types of Natural Selection	Case Study 4 (Malaria); Section 21.4
R - 9/27	Patterns of Natural Selection	Section 21.4
T - 10/2	Sexual Selection	Sections 21.4 & 45.7
R - 10/4	Genetic Drift & Gene Flow	Section 21.5
T - 10/9	<i>Exam 1</i>	
R - 10/11	Adaptation, Life History & Environment	Sections 47.6
T - 10/16	Interactions & Coevolution	Case Study 4 (Malaria); Sections 1.5, 47.1-47.3
R - 10/18	Phylogeny & Homology	Sections 23.1-23.2
T - 10/23	<i>Quiz 2</i> ; Speciation I	Chapter 22
R - 10/25	Speciation II	Chapter 22
T - 10/30	Phylogeny II & Biogeography	Sections 23.3-23.4, 46.3 (start pg. 46-14)
R - 11/1	Human Evolution	Chapter 24
T - 11/6	Evo-Devo	Sections 21.6, 23.3-23.4

R – 11/8	Population Ecology	Chapter 46
T – 11/13	Exam 2	
R – 11/15	Community Ecology	Sections 47.4
T – 11/20	Ecosystems	Sections 1.3, 25.3, 47.5; Fig 48.16
R – 11/22	NO CLASS - (THANKSGIVING)	
T – 11/27	Biogeochemical Cycles	Sections 25.1-25.2
R – 11/29	Quiz 3; Climate Change	Sections 48.1 & 25.1 – 25.3
T – 12/4	Climate Change	Sections 48.2 – 48.3
R – 12/6	Conservation Biology	Case Study 8 (Hotspots), Sections 1.6, 46.3, Chapter 48
T – 12/11	Disease Ecology	Online reading
FINAL: TBD	FINAL EXAM WEEK: DECEMBER 15-21, 2018	

Note: this is a tentative schedule, any changes will be posted to Moodle