

## BIOLOGY 205-004: FOUNDATIONS OF BIOLOGY: ECOLOGY AND EVOLUTION

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<b>OFFICE:</b>	340F Central King Bldg.	<b>OFFICE HOURS:</b>	T & R. 1:00PM- 2:00PM. W: 10:00AM- 11:30AM or email for appointment
<b>COURSE SCHEDULE:</b>	T & R: 11:30 AM- 12:55PM	<b>COURSE WEBSITE:</b>	<a href="http://moodle.njit.edu">http://moodle.njit.edu</a>
<b>COURSE LOCATION:</b>	CKB 303		

**COURSE DESCRIPTION:** Ecology and evolutionary biology are fundamental to our understanding 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 affects 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 Website:** [Moodle](#), 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](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 instructors, you should post your questions on Piazza. If you have any problems or feedback for the developers, email [team@piazza.com](mailto:team@piazza.com). Questions of a personal nature should still be directed to your instructors at the emails above.

Find our class page at: [piazza.com/njit/spring2017/205](http://piazza.com/njit/spring2017/205). A link to Piazza will also be available 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.

**PREREQUISITES:** Concepts in Biology (BIOL 200)

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

### REQUIRED MATERIALS:

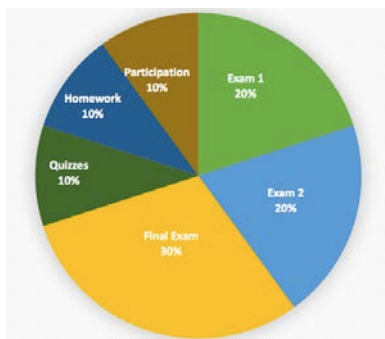
- ⊕ CP NJIT BIO How Life Works & LP Access Card. ISBN: 1-4641-7316-8. This is a custom textbook meaning that it only includes selected chapters from a larger textbook. This textbook will be the starting point for all class materials and we will add additional materials to the course website. It can be 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/1887044>. 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 **i>Clicker (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.

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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 (iClickers, online quizzes, in-class work)	50 points
Homework	50 points
Exam 1	100 points
Exam 2	100 points
Final Exam	150 points
<b>Total</b>	<b>500 points</b>

Letter Grade	Total Number of Points	Percentage
A	405 – 450	90 – 100
B+	382.5 – 405	85 – 90
B	360 – 382.5	80 – 85
C+	337.5 – 360	75 – 80
C	292.5 – 337.5	65 – 75
D	225 – 292.5	50 – 65
F	0 – 225	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.

**Homework.** There will be one homework assignment on Experimental Design worth 50 points. You will complete an online tutorial and then design and test your own experiment. You will also evaluate another person's experiment through peer review. Late homework will lose 10% per day.

**PARTICIPATION POINTS:** Participation points are earned by answering iClicker questions (some must be answered correctly, but not all), completing online Moodle assignments, 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 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 41.7 of the possible 50 in your final grade;  $(125/150) * 50 = 41.7$  participation points. We will post the grades for participation points three times during the year on: 10/11, 11/15, and 12/16. Each time we post them we will give you 6 extra points, allowing you to miss up to 3 classes (for excused or unexcused reasons) without losing any points.

**MAKE UP EXAMS AND QUIZZES:** Make up exams will be possible only with a doctor's or a dean's letter or with prior approval. If you have a serious reason for missing an exam, you must make sure to contact us BEFORE the scheduled exam period (two days) that you cannot take the exam and if approved you should then arrange as soon as possible to take the make-up exam. Because the lowest of your three quizzes gets dropped, you will not need to take a makeup quiz. Instead, your missed quiz will count as the dropped quiz.

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**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 us 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!

**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.*

WEEK	LECTURE TOPIC	READING AND/OR ASSIGNMENT
T – 1/17	Course Introduction & Pretest	<b>Syllabus</b>
R – 1/19	Scientific Method, Statistics	<b>Sections 1.1 - 1.3; Statistics Primer</b>
T – 1/24	Statistics & Mini-Genetics Review	<b>Online Genetics Primer</b>
R – 1/26	Origin of Genetic Variation, Population Genetics	<b>Sections 21.1 - 21.2</b>
T – 1/31	Population Genetics Hardy Weinberg	<b>Section 21.3</b>
R – 2/2	<b>Quiz 1;</b> Natural Selection	<b>Case Study 4 (Malaria); Section 21.4 Homework due</b>
T – 2/7	Mechanisms of Evolution: Natural Selection / Altruism	<b>Section 21.4 Section 45.6</b>
R – 2/9	Mechanisms of Evolution: Sexual Selection	<b>Section 45.7</b>
T – 2/14	Mechanisms of Evolution: Genetic Drift / Gene Flow	<b>Section 21.5</b>
R – 2/16	<b>Exam 1</b>	
T – 2/21	What is a Species? Allopatric Speciation	<b>Section 21.6, 22.1, 22.2, 22.3</b>
R – 2/23	Sympatric Speciation	<b>Section 22.3 &amp; 22.4</b>
T – 2/28	Phylogeny	<b>Sections 23.1 - 23.2</b>
R – 3/2	Phylogeny	<b>Sections 23.1 - 23.2</b>

T – 3/7	<b>Quiz 2;</b> Phylogeny	
R – 3/9	History of Life on Earth	<b>Sections 23.3 - 23.4</b>
3/14 & 3/16	<b>SPRING BREAK – NO CLASSES</b>	
T – 3/21	Human Evolution	<b>Sections 24.1 - 24.2</b>
R – 3/23	Human Evolution	<b>Sections 24.3 - 24.5</b>
T – 3/28	Evolution of Human Skin Color - Case Study	
R – 3/30	<b>Exam 2</b>	
T – 4/4	Population Ecology	<b>Sections 46.1 - 46.2</b>
R – 4/6	Population Ecology	<b>Sections 46.3</b>
T – 4/11	Community Ecology	<b>Sections 47.1 - 47.4; Case Study 8 (Biodiversity Hotspots)</b>
R – 4/13	<b>Quiz 3:</b> Ecosystems	<b>Sections 47.5, 47.6, 25.1, 25.2</b>
T – 4/18	Ecosystems & Global Climate Change	<b>Sections 26.3; 48.1 - 48.3</b>
R – 4/20	Global Climate change	<b>Sections 48.1 - 48.3</b>
T – 4/25	Conservation Biology	<b>Sections 48.4 - 48.5</b>
T– 4/27	Disease Ecology	<b>Online Reading</b>
<b>FINALS</b>	<b>FINAL EXAM WEEK: MAY 05-11, 2017</b>	