

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

<b>INSTRUCTOR:</b>	Dr. Ellen Wisner	<b>EMAIL:</b>	<a href="mailto:wisner@njit.edu">wisner@njit.edu</a>
<b>OFFICE:</b>	340D Central King Bldg.	<b>OFFICE HOURS:</b>	Wed: 10:15AM – 1:15PM
<b>COURSE SCHEDULE:</b>	T, R: 11:30am–12:55pm	<b>COURSE WEBSITE:</b>	<a href="http://moodle.njit.edu">http://moodle.njit.edu</a>
<b>COURSE LOCATION:</b>	CKB 303	<b>COURSE TWITTER:</b>	@EMWisner, #BIOL205

**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.

### COURSE OBJECTIVES:

Students are able to:

1. Design an experiment and use statistics to test whether there is a significant different 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 205).

### REQUIRED MATERIALS:

- ⊗ CP NJIT BIO How Life Works & LP Access Card. ISBN: 1-4641-7316-8.
- ⊗ An [i>Clicker \(II or Plus\)](#) is required for this course.

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**GRADING POLICY & SCALE:** Grades will be determined by performance on exams, quizzes, and class participation. There will be three exams, the first two exams will be worth 100 points each, and the final exam will be worth 150 points. There will be three in-class quizzes that will be worth 25 points each and the lowest quiz grade will be dropped.

Assignments	Points
Quizzes (25 pts each)	50 points
Class participation (iClickers, online quizzes, 2-minute essays)	50 points
Exam 1	100 points
Exam 2	100 points
Final Exam	150 points
<b>Total</b>	<b>450 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

**PARTICIPATION POINTS:** Participation is worth 50 out of 450 points. Participation points are earned by answering iClicker questions (some must be answered correctly, but not all), online Moodle assignments, and by completing in-class assignments. 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. NOTE: There will be 3 to 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. I will post the grades for participation points three times during the year on: 2/28, 3/4, and 5/5. Each time I post them I will give you 5 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 talk to me BEFORE the scheduled exam period to notify me that you cannot take the exam. You are then responsible for arranging with me to make up the test within two days. *There are no make-up quizzes. If you miss a quiz, it will count as your dropped quiz.*

**ELECTRONICS / CELL PHONE POLICY:** The use of cell phones is not allowed in class. If you are caught using a cell phone, or another electronic device (iPod, etc.), you will lose points from your grade. Laptops can be used to take notes in class; however, if you abuse this privilege by using them for non-class related purposes, you will lose points.

**ACADEMIC INTEGRITY:** The University's academic integrity policy can be found [here](#). This code will be enforced in this course. If you have any questions about this policy, please come and talk to me about it.

**MOODLE:** We will be using Moodle for our class website (<https://moodle.njit.edu>). 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). 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.

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**COURSE OUTLINE:** *NOTE: 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
Week 1 1/18 – 1/22	T: Course Overview & Pretest R: Scientific Method, Statistics <b>**First day of class is 1/19**</b>	<b>Syllabus!</b> <b>Sections 1.1- 1.3; Statistics Primer</b>
Week 2 1/25 – 1/29	T: Statistics & Mini- Genetics Review R: Origin of Genetic Variation, Population Genetics	<b>Online Genetics Primer</b> <b>Sections 21.1- 21.2</b>
Week 3 2/1 – 2/5	T: Population Genetics Hardy Weinberg R: <b>Quiz 1</b> ; Natural Selection	<b>Section 21.3</b> <b>Case Study 4 (Malaria); Section 21.4</b>
Week 4 2/8 – 2/12	T: Mechanisms of Evolution: Natural Selection / Altruism R: Mechanisms of Evolution: Sexual Selection	<b>Section 21.4 Section 45.6</b> <b>Section 45.7</b>
Week 5 2/15 – 2/19	T: Mechanisms of Evolution: Genetic Drift / Gene Flow R: <b>Exam 1</b>	<b>Section 21.5</b> <b>2/18 EXAM 1</b>
Week 6 2/22 – 2/26	T: What is a Species? Allopatric Speciation R: Sympatric Speciation	<b>Section 21.6, 22.1, 22.2, 22.3</b> <b>Section 22.3 &amp; 22.4</b>
Week 7 2/29 – 3/4	T,R: Phylogeny	<b>Sections 23.1 – 23.2</b>
Week 8 3/7 – 3/11	T: <b>Quiz 2</b> ; Phylogeny R: History of Life on Earth	<b>3/8 QUIZ 2</b> <b>Sections 23.3 - 23.4</b>
Week 9 3/14 – 3/18	<b>MARCH 13-20: SPRING BREAK – NO CLASS THIS WEEK</b>	
Week 10 3/21 – 3/25	T: Human Evolution R: Human Evolution <b>MARCH 25, 2016 : GOOD FRIDAY- SCHOOL CLOSED</b>	<b>Sections 24.1 - 24.2</b> <b>Sections 24.3 - 24.5</b>
Week 11 3/28 – 4/1	T: Evolution of Human Skin Color - Case Study R: <b>EXAM 2</b>	<b>3/31 EXAM 2</b>
Week 12 4/4 – 4/8	T: Population Ecology R: Population Ecology	<b>Sections 46.1 - 46.2</b> <b>Sections 46.3</b>
Week 13 4/11 – 4/15	T: Community Ecology R: <b>Quiz 3</b> : Ecosystems	<b>Sections 47.1 - 47.4; Case Study 8</b> <b>(Biodiversity Hotspots)</b> <b>Sections 47.5, 47.6, 25.1, 25.2</b>
Week 14 4/18- 4/22	T: Ecosystems & Global Climate Change R: Global Climate change	<b>Sections 26.3; 48.1 - 48.3</b> <b>Sections 48.1 - 48.3</b>
Week 15 4/25 – 4/29	T: Conservation Biology R: Disease Ecology	<b>Sections 48.4 - 48.5</b> <b>Online Reading</b>
5/3	<b>**MAY 3:</b> Last day of class and a <b>FRIDAY</b> schedule, so we will have class on that day.	
<b>FINALS</b>	<b>FINAL EXAM WEEK: MAY 6-12, 2016</b>	