

## BIOLOGY 205-H02: FOUNDATIONS OF BIOLOGY: ECOLOGY AND EVOLUTION – HONORS

<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>	W: 10:15AM- 1:15PM
<b>COURSE MEETINGS:</b>	M: 1–2:25PM, W: 8:30-9:55AM	<b>COURSE WEBSITE:</b>	<a href="http://moodle.njit.edu">http://moodle.njit.edu</a>
<b>COURSE LOCATION:</b>	CKB 206	<b>COURSE TWITTER:</b>	@EMWisner, #BIOL205H

**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. In addition, this course aims to help students think critically, making connections between different concepts and drawing conclusions from scientific data.

### 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.
13. Read and summarize scientific literature and make connections between multiple scientific articles.
14. Work successfully within a group by breaking complex tasks into parts, planning and managing time, delegating responsibilities, and effectively communicating.

**PREREQUISITES:** Concepts in Biology (BIOL 200), co-requisite BIOL 206.

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**REQUIRED MATERIALS:**

- ⊕ CP NJIT BIO How Life Works & LP Access Card. ISBN: 1-4641-7316-8.

**GRADING POLICY & SCALE:** Grades will be determined by performance on exams, in-class assignments, online homework, and a case study group project. There will be two in-class exams, worth 80 points each. There will be a cumulative final exam worth 110 points. In-class assignments and homework will be worth a total of 100 points, and the case study group project will be worth 130 points.

Assignments	Points
In-Class Exams (80 points each)	160 points
Final Exam	110 points
Case Study Group Project	130 points
In-class assignments and homework	100 points
<b>Total</b>	<b>500 points</b>

**CASE-STUDY GROUP PROJECT:** During this course you will become familiar with case studies. Once per week we will go through a case study as an entire class. The case study project is something you will work on throughout the semester and includes assignments that will be completed as individuals, and as a group. Thorough instructions and guidelines for the project can be found on moodle, deadlines are in that document as well as listed on the tentative course schedule in this syllabus.

**WEEKLY ONLINE ASSIGNMENT:** Each week you will complete an online assignment about the assigned reading. This online assignment will be due on Sunday night by 11:59 PM. These assignments will be part of your in-class assignments/homework grade.

**MAKE UP EXAMS:** 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.

**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>).

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COURSE OUTLINE: *NOTE: The final exam WILL be held during the final exam period listed below.*

**TENTATIVE SCHEDULE OF TOPICS**

WEEK	TOPIC COVERED	READING / ASSIGNMENTS DUE
18-Jan	<b>M:</b> SCHOOL CLOSED <b>W:</b> Course Overview & Pretest	Syllabus
25-Jan	<b>M:</b> Scientific Method & Statistics <b>W:</b> Origin of Variation & Population Genetics	Sections 1.1 – 1.3; Statistics Primer (moodle) Section 21.1, 21.2; Genetics Primer (moodle)
1- Feb	<b>M:</b> Hardy-Weinberg Equilibrium <b>W:</b> Natural Selection & Sexual Selection	Section 21.3 Section 21.4 & 45.7
8-Feb	<b>M:</b> Sexual Selection, Coevolution <b>W:</b> Genetic Drift, Gene Flow, Mutation, and Inbreeding Depression	Section 45.7 Section 21.5 & 21.6 <b>CS: Topic selection is due by midnight on 2/14 for your case study project</b>
15-Feb	<b>M:</b> Behavior & Altruism <b>W:</b> EXAM 1	Sections 45.1, 45.2 & 45.6 <b>CS: Sometime between 2/16 and 2/20 your group must meet with Dr. Wisner</b>
22-Feb	<b>M:</b> Speciation <b>W:</b> Speciation	Chapter 22
29-Feb	<b>M:</b> Phylogenetics <b>W:</b> Phylogenetics	Sections 23.1 & 23.2 <b>CS: Individual essay due by midnight on 3/2</b>
7-Mar	<b>M:</b> History of Life on Earth <b>W:</b> History of Life on Earth	Sections 23.1 & 23.2 Sections 23.3-23.4
<b>SPRING BREAK 3/13-3/20, 2016</b>		
21-Mar	<b>M:</b> Human Evolution <b>W:</b> Human Evolution	Chapter 24.3, 24.5
28-Mar	<b>M:</b> Human Evolution <b>W:</b> EXAM 2	<b>CS: Case study plan due 3/28 by midnight</b>
4-Apr	<b>M:</b> Population Ecology <b>W:</b> Community Ecology	Chapter 46 Sections 47.1 – 47.4 <b>CS: Case rough draft due 4/8 by midnight</b>
11-Apr	<b>M:</b> Ecosystems <b>W:</b> Global Climate Change	Sections 47.5 & 47.6, Chapter 25 Sections 48.1 – 48.3
18-Apr	<b>M:</b> Conservation Biology <b>W:</b> Conservation Biology	Sections 48.4 & 48.5
25-Apr	<b>M:</b> Case Study Presentations <b>W:</b> Case Study Presentations	<b>CS: Final written case due 4/24 by midnight</b>
2-May	<b>M:</b> Case Study Presentations	
<b>FINALS</b>	<b>FINAL EXAM WEEK: MAY 6-12, 2016</b>	