

Biology 222 – Evolution – Syllabus – Fall 2015

Summary: Evolution is happening right now in every living species on the planet. Evolutionary biology is not about bones and fossils – they are just helpful clues nature has left for us. Evolutionary biology is all about genes and populations, mutation and natural selection, reproduction and survival. Evolution cuts across and unifies the biological sciences – from genetics and molecular biology to ecology and conservation biology to disease and medicine, evolution informs our understanding. Indeed, as the renowned geneticist Theodosius Dobzhansky observed, “Nothing in biology makes sense except in the light of evolution.”

Learning Objectives

Upon successful completion of this course, students will:

- Understand evolutionary mechanisms including genetic drift and natural selection
- Understand how to construct and interpret phylogenetic trees
- Understand the history and geography of life on Earth
- Understand the species concept and mechanisms of speciation
- Understand mechanisms of evolution of life history, sexual selection, coevolution, and development.

Course prerequisites: R120:101 and R120:102 and BIOL 205/206 with grade of C or better

Class meets: Monday: 1:00 pm - 2:25 pm, Thursday: 4:00 pm - 5:25 pm

Classroom: 303 Central King Building, NJIT

Required Materials:

1. **Text:** Evolution: Making Sense of Life, 2nd Edition, by Zimmer and Emlen, published by Roberts and Co. Publishers. ISBN: 9781936221554
2. **iClicker 2**

Grading:

Participation	10%
Quizzes and workshops (in-class and online):	20%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Final exam	25%

Grading scale: While adjustments may be made before grades are finalized, the initial course grading scale is:

A	90-100
B+	85-90
B	80-85
C+	75-80
C	65-75
D	50-65
F	0-50

Contact info and office hours:

Office hours: Monday 2:30-4:00 pm, Wednesday 11:30 am - 1 pm

Office location: 337B CKB; Phone: (973) 642-7537; Email: dbunker@njit.edu

Course Web page: Moodle (moodle.njit.edu).

We will use Moodle for coursework submission, for announcements, and for various activities. To use Moodle students must have an NJIT UCID. If you are matriculated at NJIT you should already have a UCID. If you are a Rutgers student you may already have one. You can check by following the directions here: <http://ist.njit.edu/accounts/ucid.php>. If you do not have one you can request one here <https://newacct.njit.edu/~accts/cgi-bin/new> or call the NJIT helpdesk for assistance (973 596 2900).

Attendance and Participation:

Late arrivals will not be tolerated. I expect you to attend lectures and participate in class discussions. Attendance and participation will be quantified by iClicker activity. Several quizzes will be administered during the semester. They will not be announced beforehand. There will be no makeups for quizzes. If you attend class you will likely do well in the course. If you do not attend class you will do poorly.

Assignments:

READ each chapter in Zimmer and Emlen BEFORE the lecture that covers it. Then READ it AGAIN afterwards. You will learn far more from the lectures (and therefore get a better grade) if you are familiar with the material before we cover it in class.

Makeup Policy:

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 or workshop, you must contact me BEFORE the scheduled exam or workshop.

Academic Integrity:

You are expected to abide by the NJIT Code of Student Conduct <<http://www.njit.edu/doss/policies/conductcode/>> and the NJIT University Code on Academic Integrity <<http://www.njit.edu/education/pdf/academic-integrity-code.pdf>>, which you agreed to do upon entering NJIT. Please re-read the NJIT University Code on Academic Integrity, which describes conducts that are considered unacceptable (cheating, violating the US Copyright law, etc), as well as consequences for students that violate the Code. I will not tolerate cheating – it is my responsibility to protect my honest students from cheaters and I will do so. Cheating during exams will not be tolerated, nor will any form of plagiarism.

Cellular Phones: All cellular phones and beepers must be switched off during all class times.

Key Dates:

- Tuesday, Sept. 8: Last day to add/drop.
- Tuesday, Sept. 8: Monday classes meet! (That's us!)
- Monday, Sept. 28: Exam 1.
- Monday, Nov. 2: Last day to withdraw.
- Monday, Oct. 19: Exam 2
- Thursday, Nov. 12: Exam 3
- Thursday, Dec. 10: Last day of classes.
- Dec. 15 – 21: Final exam period.

Course outline:

Lecture	Day	Date	Topic
1	R	3-Sep	Chapter 1. The Whale and the Virus: How Scientists Study Evolution
2	T	8-Sep	Workshop 1: Natural selection. Note class is on Tuesday!!
3	R	10-Sep	Chapter 2. From Natural Philosophy to Darwin: A Brief History of Evolutionary Ideas
4	M	14-Sep	Chapter 3. What the Rocks Say: Geology and Paleontology Reveal the History of Life
5	R	17-Sep	Chapter 4. The Tree of Life: How Biologists Use Phylogeny to Reconstruct the Deep Past
6	M	21-Sep	Chapter 4. Part 2.
7	R	24-Sep	Workshop 2: Constructing Phylogenetic Trees
8	M	28-Sep	Exam 1
9	R	1-Oct	Chapter 5. Raw Material: Heritable Variation among Individuals
10	M	5-Oct	Chapter 6. The Ways of Change: Drift and Selection
11	R	8-Oct	Workshop 3: Hardy-Weinberg, Genetic Drift, and Inbreeding
12	M	12-Oct	Chapter 7. Beyond Alleles: Quantitative Genetics and the Evolution of Phenotypes
13	R	15-Oct	Workshop 4: Quantitative Traits and Heritability
14	M	19-Oct	Exam 2
15	R	22-Oct	Chapter 8. Natural Selection: Empirical Studies in the Wild
16	M	26-Oct	Chapter 9. The History in Our Genes
17	R	29-Oct	Chapter 10. Adaptation: From Genes to Traits
18	M	2-Nov	Chapter 11. Sex: Causes and Consequences
19	R	5-Nov	Chapter 12. After Conception: The Evolution of Life History and Parental Care
20	M	9-Nov	Workshop 5/review
21	R	12-Nov	Exam 3
22	M	16-Nov	Chapter 13. The Origin of Species
23	R	19-Nov	Chapter 14. Macroevolution: The Long Run
24	M	23-Nov	Chapter 15. Intimate Partnership: How Species Adapt to Each Other
25	M	30-Nov	Chapter 16. Minds and Microbes: The Evolution of Behavior
26	R	3-Dec	Chapter 17. Human Evolution: A New Kind of Ape
27	M	7-Dec	Chapter 18. Evolutionary Medicine
28	R	10-Dec	Review

Comprehensive final exam during final exam period!!!!