

BIOLOGY 222-001: EVOLUTION

INSTRUCTOR:	Daniel Bunker	PHONE:	973-642-7537
OFFICE:	433 Colton Hall	EMAIL:	dbunker@njit.edu
OFFICE HOURS:	M: 4:00 – 5:30 pm, F: 11:30 am – 1:00 pm	WEBSITE:	http://moodle.njit.edu/
COURSE SCHEDULE:	M: 2:30 – 3:55 pm, R 4:00 – 5:25 pm, GITC 1400, NJIT		

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, 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.

PREREQUISITES: General Biology I & II (R120:101/102), Foundations of Biology: Ecology and Evolution (BIOL 205/206) with a grade of C or better.

REQUIRED MATERIALS:

- ⊗ Text: Bergstrom and Dugatkin, Evolution. ISBN: 978-0-393-92592-0, Norton & Co.
(Note that they offer the text as a more affordable eBook.)
- ⊗ An **iClicker**

COURSE WEB PAGE: 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).

- ⊗ We will also use the free StudySpace website for the text: <http://www.wwnorton.com/college/biology/evolution/>

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GRADING:

Tentative grading scale: While adjustments will be made before the final grade is issued, the initial grading scale to be used in determining your final grade is:

Attendance & Participation:	10%
Quizzes (in-class & online):	20%
Mid-term Exam I:	20%
Mid-term Exam II:	20%
Final Exam:	30%
TOTAL	100%

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

BIOLOGY 222 COURSE POLICIES:

- ⊗ **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.
- ⊗ **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, you must contact me BEFORE the scheduled exam.
- ⊗ **Academic Integrity:** Students are reminded of the Honor Code each you agreed to upon entering NJIT. Violations of Academic Integrity will be dealt with according to the guidelines indicated in the [NJIT Academic Honor Code](#). Please re-read Article III of the [Honor Code](#), which describes conducts that are considered unacceptable (cheating, violating the US Copyright law, etc). I will not tolerate cheating – it is my responsibility to protect my 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:

M: Sept. 8:	Last day to add/drop	M: Nov. 3:	Mid-Term II
R: Oct. 2:	Mid-Term I	T: Nov. 25:	Thursday schedule, class meets
M: Nov. 3:	Last day to withdraw	W: Dec. 10:	Last day of classes
MONDAY – FRIDAY: DECEMBER 15-19: FINAL EXAM PERIOD			

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COURSE OUTLINE:

LECT	DAY	DATE	TOPIC	ASSIGNMENT
1	R	4-Sep	What is Evolutionary Biology?	
2	M	8-Sep	Workshop 1: Natural selection	Read B&D Ch. 1 and 2
3	R	11-Sep	Chapter 2: Early Evolutionary Ideas and Darwin's Insight	
4	M	15-Sep	Chapter 3: Natural Selection	Read B&D Ch. 3
5	R	18-Sep	Chapter 4: Phylogeny and Evolutionary History	Read B&D Ch. 4
6	M	22-Sep	Chapter 5: Inferring Phylogeny	Read B&D Ch. 5
7	R	25-Sep	Workshop 2: Phylogenies	Review
8	M	29-Sep	Review	Review
9	R	2-Oct	EXAM 1	Study
10	M	6-Oct	Chapter 6: Transmission Genetics and Sources of Genetic Variation	Read B&D Ch. 6
11	R	9-Oct	Chapter 7: The Genetics of Populations	Read B&D Ch. 7
12	M	13-Oct	Chapter 8: Evolution in Finite Populations	Read B&D Ch. 8
13	R	16-Oct	Workshop 3: Genetic drift	Review
14	M	20-Oct	Chapter 9: Evolution at Multiple Loci	Read B&D Ch. 9
15	R	23-Oct	Chapter 10: Genome Evolution	Read B&D Ch. 10
16	M	27-Oct	Workshop 4: Heritability	Review
17	R	30-Oct	Review	Review
18	M	3-Nov	EXAM 2	Study
19	R	6-Nov	Chapter 11: The Origin and Evolution of Early Life	Read B&D Ch. 11
20	M	10-Nov	Chapter 12: Major Transitions	Read B&D Ch. 12
21	R	13-Nov	Chapter 18: The Evolution of Sociality	Read B&D Ch. 18
22	M	17-Nov	Chapter 13: Evolution and Development	Read B&D Ch. 13
23	R	20-Nov	Chapter 14: Species, Speciation and Ch. 15: Extinction	Read B&D Chs. 14&15
24	M	24-Nov	Chapter 16: The Evolution of Sex	Read B&D Ch. 16
25	T	25-Nov	Chapter 17: Sexual Selection	Read B&D Ch. 17
26	M	1-Dec	Chapter 19: Coevolution	Read B&D Ch. 19
27	R	4-Dec	Chapter 20: Evolution and Medicine	Read B&D Ch. 20
28	M	8-Dec	Review and in class activities	Review
FINALS			FINAL EXAM WEEK: DECEMBER 15-19, 2014	