

BIOLOGY 222 (002-004): EVOLUTION

INSTRUCTORS:	Dr. Daniel Bunker	PHONE:	973-642-7537
OFFICE:	337B Central King Building	EMAIL:	dbunker@njit.edu
OFFICE HOURS:	R: 11:30AM – 1:00PM	COURSE WEBSITE:	https://canvas.njit.edu/
COURSE SCHEDULE:	T & R: 10:00AM – 11:20AM CKB G08 (Sec. 002) T & R: 4:00PM – 5:20PM, CKB G08 (Sec. 004)		

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 evolution of disease.

PREREQUISITES: Foundations of Biology: Cell & Molecular (BIOL 201/202 or R120:201/202), Foundations of Biology: Ecology and Evolution (BIOL 205/206 or R120: 205/206) with a grade of C or better.

REQUIRED MATERIALS:

- Text: Bergstrom and Dugatkin, **Evolution**. 2nd Edition. ISBN: 978-0-393-92592-0, Norton & Co.
(Note that they offer the text as a more affordable eBook.)

An  **Clicker, no app** (<https://www1.iclicker.com/students-get-started/>)

COURSE WEB PAGE: We will use [Canvas](#) for coursework submission, for announcements, and for various activities. To use Canvas 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: <https://ist.njit.edu/ucid/>. 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). Be sure to check your njit email or set Canvas to forward it to your everyday email account.

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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:

Assignments	Percentage
Participation	10%
Quizzes and workshops (in class and online)	20%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Final Exam	25%
Total	100%

Letter Grade	Percentage
A	90 – 100
B+	85 – 90
B	80 – 85
C+	75 – 80
C	70 – 75
D	60 – 70
F	0 - 60

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.
- Assignments:** READ each chapter in Bergstrom and Dugatkin 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, 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.
- Disability accommodations:** If you need accommodations due to a disability, please contact Chantonette Lyles, Associate Director of Disability Support Services, Fenster Hall Room 260 to discuss your specific needs. A Letter of Accommodation Eligibility from the Disability Support Services office authorizing your accommodations will be required.

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KEY DATES:

F: Jan. 31:	Last day to add/drop	T: Apr. 07:	Exam 3
M: Feb. 03:	Last day to withdraw with 90%	R. Apr. 30:	Last day of Class for Evolution
T: Feb. 18:	Exam 1	T. May 05	No CLASS – Friday Schedule
R: Mar. 12:	Exam 2		
M: Apr. 06:	Last day to withdraw		
FRIDAY - THURSDAY: MAY 8 - 14: FINAL EXAM PERIOD			

COURSE OUTLINE:

Lecture	Day	Date	Topic	Assignment
1	Tues	21-Jan	An Overview of Evolutionary Biology	Read B&D Ch. 1
2	Thurs	23-Jan	Early Evolutionary Ideas and Darwin’s Insight	Read B&D Ch. 1 and 2
3	Tues	28-Jan	Natural Selection	Read B&D Ch. 3
4	Thurs	30-Jan	Workshop 1: Natural selection	Review
5	Tues	4-Feb	Phylogeny and Evolutionary History	Read B&D Ch. 4
6	Thurs	6-Feb	Inferring Phylogeny	Read B&D Ch. 5
7	Tues	11-Feb	Workshop 2: Phylogenies	Review
8	Thurs	13-Feb	Transmission Genetics and Sources of Genetic Variation	Read B&D Ch. 6
9	Tues	18-Feb	Exam 1	Study
10	Thurs	20-Feb	The Genetics of Populations	Read B&D Ch. 7
11	Tues	25-Feb	Evolution in Finite Populations	Read B&D Ch. 8
12	Thurs	27-Feb	Workshop 3: Genetic drift	Review
13	Tues	3-Mar	Evolution at Multiple Loci	Read B&D Ch. 9
14	Thurs	5-Mar	Workshop 4: Heritability	Review
15	Tues	10-Mar	Genome Evolution	Read B&D Ch. 10
16	Thurs	12-Mar	Exam 2	Study
17	Tues	24-Mar	The Origin and Evolution of Early Life	Read B&D Ch. 11
18	Thurs	26-Mar	Major Transitions	Read B&D Ch. 12
19	Tues	31-Mar	Species and Speciation	Read B&D Ch. 14
20	Thurs	2-Apr	Extinction and Evolutionary Trends	Read B&D Ch. 15
21	Tues	7-Apr	Exam 3	Study
22	Thurs	9-Apr	Sex and Sexual Selection	Read B&D Ch. 16
23	Tues	14-Apr	The Evolution of Sociality	Read B&D Ch. 17
24	Thurs	16-Apr	Workshop 5: Evolution of sociality	Review
25	Tues	21-Apr	Coevolution	Read B&D Ch. 18
26	Thurs	23-Apr	Human Evolution	Read B&D Ch. 19

27	Tues	28-Apr	Evolution and Medicine	Read B&D Ch. 20
28	Thurs	30-Apr	Review and in-class activities	Review
29	Tues	5-May	No class - Friday schedule	

Comprehensive final exam during final exam period!!!! *DO NOT MAKE ANY TRAVEL ARRANGEMENTS DURING THIS TIME *****