NJIT BIOLOGY

Course Syllabus

FALL 2017

BIOLOGY 222-001: EVOLUTION

INSTRUCTOR:	Dr. Daniel Bunker	**PHONE:**	973-642-7537
OFFICE:	337B Central King Building	**EMAIL:**	dbunker@njit.edu
OFFICE HOURS:	W & F: 2:30PM – 4:00PM	**COURSE WEBSITE:**	http://moodle.njit.edu/
COURSE SCHEDULE:	W & F: 1:00PM– 2:25PM, , TIERNAN HALL LECTURE 1, 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**. 2nd Edition. ISBN: 978-0-393-92592-0, Norton & Co. (Note that they offer the text as a more affordable eBook.)

An i▸**Clicker or Reef Polling app (https://www1.iclicker.com/students-get-started/)**

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: 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).

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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.

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KEY DATES:

M: Sept. 11:	Last day to add/drop		F: Nov. 17:	**Exam 3**
M: Sept. 18:	Last day to withdraw with 90%		W. Nov. 22	**Follows Fri. schedule, Class meets at 1:00pm**
F: Sept. 29:	**Exam 1**		R. Nov. 24	Thanksgiving break – **NO CLASS on this Friday (11/25)**
F: Oct. 27:	**Exam 2**		W. Dec. 13	Last Day of Classes
M: Nov. 6:	Last day to withdraw		Dec. 15 - 21	FINAL EXAM PERIOD
FRIDAY - THURSDAY: DECEMBER 15-21: FINAL EXAM PERIOD				

COURSE OUTLINE:

DAY	DATE	TOPIC	ASSIGNMENT
W	6-Sept.	An Overview of Evolutionary Biology	Read B&D Ch. 1
F	8-Sept.	Early Evolutionary Ideas and Darwin's Insight	B&D Ch. 1&2
W	13-Sept.	Natural Selection	Read B&D Ch. 3
F	15-Sept.	Workshop 1: Natural selection	Review
W	20-Sept.	Phylogeny and Evolutionary History	Read B&D Ch. 4
F	22-Sept.	Inferring Phylogeny	Read B&D Ch. 5
W	27-Sept.	Workshop 2: Phylogenies	Review
F	29-Sept.	**EXAM 1**	Study
W	4-Oct.	Transmission Genetics and Sources of Genetic Variation	Read B&D Ch. 6
F	6-Oct.	The Genetics of Populations	Read B&D Ch. 7
W	11-Oct.	Evolution in Finite Populations	Read B&D Ch. 8
F	13-Oct.	Workshop 3: Genetic drift	Review
W	18-Oct.	Evolution at Multiple Loci	Read B&D Ch. 9
F	20-Oct.	Genome Evolution	Read B&D Ch. 10
W	25-Oct.	Workshop 4: Heritability	Review
F	27-Oct.	**EXAM 2**	Study
W	1-Nov.	The Origin and Evolution of Early Life	Read B&D Ch. 11
F	3-Nov.	Major Transitions (and possibly EvoDevo)	Read B&D Ch. 12&13
W	8-Nov.	Evolution and Development	Read B&D Ch. 13
F	10-Nov.	Species and Speciation	Read B&D Ch. 14
W	15-Nov.	Extinction and Evolutionary Trends	Read B&D Ch. 15
F	17-Nov.	**EXAM 3**	Study
W	22-Nov.	Sex and Sexual Selection	Read B&D Ch. 16

F	29-Nov.	The Evolution of Sociality	Read B&D Ch. 17
W	1-Dec.	Coevolution	Read B&D Ch. 18
F	6-Dec.	Human Evolution	Read B&D Ch. 19
W	8-Dec.	Evolution and Medicine	Read B&D Ch. 20
F	13-Dec	Review and in class activities	Review
FINAL EXAM WEEK: DECEMBER 15-21, 2017			

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