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Ecology and Evolution

David J. Lohman
CUNY City College

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BIO 228: Ecology and Evolution Fall 2020

Lecture: Friday, 9:50–10:30 AM
Laboratory: Section 1EG: Monday, 2:00–5:50 PM (Melina Giakoumis, instructor)
Section 2KM: Tuesday, 8:00–11:50 AM (Kathryn Mercier, instructor)
Section 2PS: Tuesday, 2:00–5:50 PM (Melina Giakoumis, instructor)
Section 3GW: Wednesday, 6:10–10:00 PM (Kathryn Mercier, instructor)

Online teaching: All lectures and laboratories will be online and fully synchronous throughout the semester, which means that we will “meet” online at the scheduled class time. Some labs will require you to walk around your neighborhood on your own or go to a nearby park or other wooded area.

Lectures and labs will take place within Blackboard, look for the link “**Virtual Classroom**” in the menu on the left side of the screen.

Catalog description: Introduction to the basic principles of ecology and evolutionary biology emphasizing quantitative approaches and hypothesis testing. Scientific reasoning, computer literacy, and writing skills are developed in the laboratory.

Prerequisites and co-requisites: Bio 206 (Genetics) and Math 209 (Calculus and Statistics) are co-requisites. Math 209 and Bio 228 are designed to be taken simultaneously.

Hours/credits: 4 credits; 6 hours per week (2 hours lecture, 4 hours laboratory). As a rule of thumb, students should spend 2-3 hours outside of class for every hour spent in the class room, meaning that it is advisable to spend 4-6 hours per week reading the assigned material and reviewing lecture notes.

Lecture instructor and course coordinator

Dr. David J. Lohman, Associate Professor

Office: Marshak 816

Office hours: Tuesday, 1:00 – 3:00 PM using the “Dave’s Office Hours” link under “Virtual Classroom”

E-mail: dlohman@ccny.cuny.edu

Webpages: lohmanlab.org & butterflynet.org

Laboratory instructors

Melina Giakoumis ♦ mgiakoumis@gradcenter.cuny.edu

Kathryn Mercier ♦ kmercier@gradcenter.cuny.edu

Blackboard: Students in Biology 228 are expected to check their Blackboard and CCNY email accounts daily. You will receive emails via Blackboard frequently, so be sure that your email used by Blackboard is current. This video provides instructions on changing your email address in Blackboard:

<https://www.youtube.com/watch?v=TtXKJWZHxY>

Learning Outcomes
1. Students will be able to describe relationships between niches, population growth, species interactions, and species distributions.
2. Students will understand the major factors that lead to biomes and to patterns of species richness.
3. Students will be able to describe the roles of fitness, selection, and genetic drift in evolution.
4. Students will understand that the global human population is growing unsustainably at an exponential or greater than exponential rate, which results in the current mass extinction event.
5. Students will understand the processes of species formation.
6. Students will be able to interpret a phylogeny to understand relationships among species.
7. Students will be able to calculate descriptive and inferential statistics and interpret their results.
8. Students will be able to compose a concise and grammatically correct paragraph.

In addition to the content-specific learning outcomes, this course will develop skills essential to the modern workplace. These will be useful in science, medicine, or any other career.

Assessment tools and grading

Exams; laboratory reports/writing assignments; class participation

<i>The final grade will be calculated as follows:</i>	
Lecture:	
Midterm exam	15%
Final exam	15%
Readings Quizzes (best 10/12)	20%
Laboratory:	
Homework	15%
Group Writing Project/Term paper	15%
Participation	10%
Class presentations	10%

Include graded lab questions that quiz readings. Quizzes may ask students to write an exam question testing understanding. Vague or poorly worded questions will not receive full credit.

Barring unforeseen circumstances, the following table will be used to compute the final grade:

A+	99 – 100%	C+	77 – 79.99%
A	93 – 98.99%	C	73 – 76.99%
A-	90 – 92.99%	C-	70 – 72.99%
B+	87 – 89.99%	D	65 – 69.99%
B	83 – 86.99%	F	0 – 64.99%
B-	80 – 82.99%		

The final grade will be a composite of the assessments and participation as noted above. If you know that you will miss an exam or lab, contact the instructor as soon as possible so that you can take the exam in advance. Make-up exams will be allowed only for *documented excused* absences (e.g., death in the family, extreme illness), and make-up exams will be oral.

Grammar, spelling, and composition: Because scientists must be able to express themselves in written prose, students must use proper spelling, grammar (including punctuation), and composition. Unintelligible sentences and illegible answers will be given no credit. Paragraphs must be composed of organized, coherent thoughts and include a lead sentence. The instructor is available during office hours or by appointment to answer questions regarding grammar and composition.

Lecture: There will be two examinations during the semester and a final exam during finals week. Each exam will test material covered in lecture, the readings, and handouts. Students should complete assigned readings before each lecture. Because material in this course continues to build on information presented earlier in the semester (and to promote long-term retention of material), exams may include both new material and selected topics from earlier sections.

Laboratory: Assignments must be submitted through Blackboard before the *beginning* of the lab. Students who miss lab due to an unexcused absence will receive an automatic zero for that assignment. With the exception of your final paper in lab, **each student is required to write and submit his or her own assignment (see section on Academic Integrity below).**

Academic Integrity

The CUNY Policy on plagiarism can be found here:

<http://www2.cuny.edu/wp-content/uploads/sites/4/page-assets/about/administration/offices/legal-affairs/policies-procedures/Academic-Integrity-Policy.pdf>

“Plagiarism is the act of presenting another person’s ideas, research or writings as your own. The following are some examples of plagiarism, but by no means is it an exhaustive list:

- Copying another person’s actual words without the use of quotation marks and footnotes attributing the words to their source.
- Presenting another person’s ideas or theories in your own words without acknowledging the source.
- Using information that is not common knowledge without acknowledging the source.
- Failing to acknowledge collaborators on homework and laboratory assignments.
- Internet plagiarism includes submitting downloaded term papers or parts of term papers, paraphrasing or copying information from the internet without citing the source, and “cutting and pasting from various sources without proper attribution.”

Be aware that if we suspect plagiarism we will report your conduct to the College’s Academic Integrity Official. Disciplinary sanctions range from failing the class to expulsion from the College.

Attendance Policy: Lectures and laboratories begin promptly, and you are required to be on time. Attendance in the lab, including field trips, is required. Absence from more than two class periods (including field trips) can result in your being dropped from the course for excessive absences (WU).

Diversity Statement: All students should be capable of excelling in this course without feeling marginalized or stigmatized because of their sexual orientation, age, socioeconomic status, race, gender, religion, or other aspect of their identity. Students with special needs will be accommodated as described in the AccessAbility Statement, and—consistent with New York State law—absences for any religious holidays can be accommodated; a minimum of two weeks advance notice is requested. If you feel that you

have been marginalized or stigmatized by the instructor or other students in this class, you should feel free to contact the instructor and/or the CCNY Office of Affirmative Action, Compliance, and Diversity.

Disability Policy: The AccessAbility Center/Student Disability Services ensures equal access and full participation to all of City College's programs, services, and activities by coordinating and implementing appropriate accommodations. If you are a student with a disability who requires accommodations and services, please visit the office in NAC 1/218, or contact AAC/SDS via email (disabilityservices@ccny.cuny.edu), or phone (212-650-5913 or TTY/TTD 212-650-8441). Students who register with AccessAbility and are entitled to specific accommodations must request a letter from AccessAbility to present to the Professor that states what their accommodations are. If specific accommodations are required for a test, students must present an "Exam Administration Request Form" from AccessAbility, at least one week prior to the test date in order to receive their accommodations.

Online Privacy: Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.

Lecture PDFs

PDFs of the lecture slides will normally be available before each lecture. These pdfs will be password encrypted. The password is: [bio228fall2020](#)

Lecture schedule (tentative; may be modified)

Lecture	Date	Topic	Reading due before class	Quiz
1	Fri 28 Aug	Course introduction; biomes & niches		
2	Fri 4 Sept	Population ecology	Biology 2e Chapter 44 https://www.youtube.com/watch?v=PUwmA3Q0_OE	24h before class on Blackboard
3	Fri 11 Sept	Community ecology	Biology 2e Chapter 45 https://www.ibiology.org/ecology/apex-predators/	24h before class on Blackboard
4	Fri 25 Sept	Biodiversity measurement & biogeography	Biology 2e Chapter 46 https://www.ibiology.org/evolution/biogeography/	24h before class on Blackboard
5	Fri 2 Oct	Ecosystem ecology; conservation biology	Biology 2e Chapter 47 https://www.ibiology.org/ecology/loss-biodiversity-human-dominated-world/	24h before class on Blackboard
6	Fri 9 Oct	Special topic: Tropical forest ecology	http://doi.org/10.1126/science.aau9460 https://www.ibiology.org/ecology/deforestation-future-amazon/	24h before class on Blackboard
	Fri 16 Oct	MIDTERM EXAM		
7	Fri 23 Oct	Introduction to evolutionary biology	Biology 2e Chapter 18 https://www.ibiology.org/ecology/phenotypic-adaptations/#part-1	24h before class on Blackboard
8	Fri 30 Oct	Fitness, selection, genetic drift	Biology 2e Chapter 19 https://www.ibiology.org/ecology/phenotypic-adaptations/#part-2	24h before class on Blackboard
9	Fri 6 Nov	Homology, phylogeny, & systematics	Biology 2e Chapter 20 https://www.ibiology.org/ecology/phenotypic-adaptations/#part-3	24h before class on Blackboard
10	Fri 13 Nov	Macroevolution	http://doi.org/10.1073/pnas.1517943113 https://www.ibiology.org/evolution/tiktaalik/	24h before class on Blackboard
11	Fri 20 Nov	Speciation	http://doi.org/10.1038/srep46487 https://www.ibiology.org/ecology/phylogeography/#part-1 https://www.ibiology.org/ecology/phylogeography/#part-2	24h before class on Blackboard
12	Wed 25 Nov	Coevolution	https://doi.org/10.1101/2020.07.08.193086 (pp. 1-16) https://www.ibiology.org/plant-biology/studying-plants-ecological-interactions-genomics-era-story-nicotiana-attenuata/#part-1 https://www.ibiology.org/plant-biology/studying-plants-ecological-interactions-genomics-era-story-nicotiana-attenuata/#part-2	24h before class on Blackboard
13	Fri 4 Dec	Special topic: Human Evolution	https://doi.org/10.1002/evan.21787 https://www.ibiology.org/evolution/african-genomics/#part-1 https://www.ibiology.org/evolution/african-genomics/#part-2	24h before class on Blackboard
	TBA	FINAL EXAM		

Biology 2e: <https://openstax.org/books/biology-2e/pages/1-introduction>

Laboratory schedule

Lab No	Section 1EG Mon 2 PM	Section 2KM Tues 8 AM	Section 2PS Tues 2 PM	Section 3GW Wed 6:10 PM	Topic
1	31 Aug	1 Sept	1 Sept	26 Aug	Getting started writing
2	14 Sept	8 Sept	8 Sept	2 Sept	Population growth
3	21 Sept	15 Sept	15 Sept	9 Sept	Pokémon community ecology
4	Tues, 29 Sept	22 Sept	22 Sept	16 Sept	Species distribution modeling
5	5 Oct	6 Oct	6 Oct	23 Sept	iNaturalist outdoor exercise
6	Weds, 14 Oct	13 Oct	13 Oct	30 Sept	Climate change
7	19 Oct	20 Oct	20 Oct	7 Oct	Descriptive statistics
8	26 Oct	27 Oct	27 Oct	21 Oct	Cladistics
9	2 Nov	3 Nov	3 Nov	28 Oct	Population genetics
10	9 Nov	10 Nov	10 Nov	4 Nov	Molecular systematics
11	16 Nov	17 Nov	17 Nov	11 Nov	Untold stories
12	23 Nov	24 Nov	24 Nov	18 Dec	Statistical tests
13	30 Nov	1 Dec	1 Dec	2 Dec	Regression
14	7 Dec	8 Dec	8 Dec	9 Dec	Capstone presentations

Instructor (person who prepared this description): David J. Lohman

Date Modified: 26 August 2020