

BIOL 306: Evolutionary Biology
Fall 2025, MW 2:00–3:15pm ISC 137

Course Objectives:

An examination of the patterns and processes of evolution from the perspective of several subdisciplines within biology.

Learning Outcomes:

By the end of this course, students will be able to:

1. State and explain the principles behind Darwin's theory of evolution by natural selection. Know what key elements his theory lacked that were discovered later.
2. Understand how to interpret evidence supporting the theory of evolution by natural selection, and understand what evidence would contradict predictions of the theory.
3. Be able to describe important theoretical questions in evolutionary biology, and interpret evidence from observation and experiment addressing these questions.
4. Know how evolutionary principles are applied to problems in medicine, conservation, and molecular biology, and be able to apply evolutionary thinking to new problems.
5. Read and understand primary literature in evolutionary biology. Describe how an experiment is designed and a scientific paper is constructed.

Instructor:

Dr. Sara Burch, ISC 358, burch@geneseo.edu

Office Hours:

Monday 3:30–4:30pm, Thursday 3–4pm, Friday 10:30–11:30am, or by appointment.

Required Textbook:

Futuyma & Kirkpatrick. *Evolution*, 5th ed (2023). ISBN: 9780197619629 [ebook or hard copy]

Additional Resources:

Brightspace: Lecture slides, activities, and worksheets will be made available on the course Brightspace page. Additional resources such as helpful reading, relevant articles, and sample test questions may also be posted.

Assignments:

In-Class Participation and Assignments: Many class periods will include some form of in-class activity to be completed in pairs or small groups. If you do not finish these during class time, they are to be completed as homework before the next class. All assignments will be turned in virtually on Brightspace.

Other Assignments: Each week, a student group will present primary literature chosen by the presenters that goes along with that week's topic. As audience members, you are expected to

come ready to discuss the papers. The final project in the class is an individual literature review on a topic of your choice.

Exams: There will be two exams consisting of multiple choice and short answer questions. Although each exam will emphasize the most recent material, the course content is naturally cumulative. As such, later exams will call for making connections to earlier material.

Grades:

In-Class Participation/Assignments	20%
Literature Presentation	20%
Exams	35%
Final Paper	25%

The grading scale for this course is the following:

A: 93%–100%	A–: 90%–92%	B+: 87%–89%	B: 83%–86%
B–: 80%–82%	C+: 77%–79%	C: 73%–76%	C–: 70%–72%
D: 60%–69%	E: <59%		

Course Policies and Resources

Exam Excuse Policies

Make-up exams and quizzes will only be given in cases of extenuating circumstances (a direct and unavoidable conflict of an academic or professional nature). Vacations, weddings, and leaving early for holidays are not acceptable excuses for taking an exam early or late. If you can't make the scheduled exam date you must contact Dr. Burch at least **ONE WEEK PRIOR** to the exam time. In cases of severe illness, family affairs, or quarantine restrictions, please contact Dr. Burch as soon as you are able to schedule accommodations.

Attendance

Although class attendance is not graded per se, you must attend classes in order to complete both in- and out-of-class assignments. Failure to come to class (or make arrangements ahead of time) will make it difficult to accomplish these assignments successfully. **However, do not come to class with symptoms of COVID-19.** If you are feeling unwell on a day that class meets in-person, do not attend. Remember that it is better to stay home if you are not feeling well than to attend class and risk spreading illness to others.

Communication

You should feel free to email me whenever you have a question or concern about the course, and I will get back to you as soon as we are able. However, please do not expect a response outside of regular business hours (9am–5pm M–F) or within 24 hours, because I may not see your email right away.

Health and Well-being

Your health and well-being are foundational to your ability to learn, and if you find that you are feeling unwell (physically or mentally) and it is impacting your ability to complete your coursework, please reach out. Students are strongly encouraged to communicate their needs to faculty and staff and seek support if they are experiencing unmanageable stress or are having difficulties with daily functioning. The Dean of Students (585-245-5706) can assist and provide direction to appropriate campus resources. Please see the Brightspace page titled “Academic & Personal Support Resources” (linked on the front page) for a complete list of on and off-campus resources to help.

Academic Dishonesty

I take plagiarism and other forms of academic dishonesty seriously. At its most basic, that means you are responsible for doing your own work. You may not reuse work from other classes, use the work of another person, plagiarize, or use artificial intelligence to help with or generate assignments. I enforce Geneseo's plagiarism policy. You can find more information about the policy here: Geneseo's Academic Dishonesty Policy. In this course, consequences of a first offense are a zero (0) on the relevant assignment or exam. Consequences of a second offense are a failing grade (E) overall in the course.

The use of AI, like Chat-GPT, is strictly prohibited. You must do your own work, which means that you should not utilize tools like Chat-GPT for any aspect of our course work. Such use is a form of academic dishonesty. Use of such tools is not only cheating, it will also cheat you of the opportunity to learn and develop your own skills. Even if AI may play a role in our future society, it is important to develop your own critical thinking, writing, and analytical skills by doing your own work. If you have any questions about this, please ask.

Accommodations:

SUNY Geneseo is dedicated to providing an equitable and inclusive educational experience for all students. The Office of Accessibility will coordinate reasonable accommodations for persons with physical, emotional, or cognitive disabilities to ensure equal access to academic programs, activities, and services at Geneseo. Students with letters of accommodation should submit a letter to each faculty member and discuss their needs at the beginning of each semester. Please contact the Office of Accessibility Services for questions related to access and accommodations. Office of Accessibility Services in Erwin Hall 22 or access@geneseo.edu or 585-245-5112.

Land Acknowledgment

Land acknowledgements are expressions of sorrow and remembrance to those whose historic territory one resides on. Geneseo resides on the homeland of the Seneca Nation of Indians and Tonawanda Seneca Nation. We encourage you to learn more about these original occupants and those indigenous to other places you have lived. You may consider using the Native Land app and/or websites such as snl.org to learn more about the community of more than 7,000 enrolled Indigenous Peoples.

DATE			TOPIC		MAJOR ASSIGNMENTS	
Aug	25	M	Evolution in Action	Ch 1.1		
	27	W	Historical Context of Evolution	Ch 1		
Sept	1	M	NO CLASS – LABOR DAY			
	3	W	Natural Selection & Adaptation	Ch 3	Presentation 1	
	8	M	The Tree of Life	Ch 2		
	10	W	Phylogenetics	Ch 16	Presentation 2	
	15	M	Macroevolution	Ch 19		
	17	W	Mutation & Variation	Ch 4	Presentation 3	
	22	M	Genetics & Natural Selection	Ch 5		Paper Topic Due
	24	W	Genetic Drift	Ch 6	Presentation 4	
	29	M	Quantitative Traits	Ch 7		
Oct	1	W	Evolution in Space	Ch 8	Presentation 5	
	6	M	Evolution of Genes & Genomes	Ch 10		
	8	W	Evo-Devo	Ch 11	Presentation 6	Paper Outline Due
	13	M	NO CLASS – FALL BREAK			
	15	W	Review			
	20	M	EXAM 1			
	22	W	Species & Speciation I	Ch 9		
	27	M	Species & Speciation II	Ch 9	Presentation 7	
	29	W	Sexual Selection I	Ch 12		
Nov	3	M	Sexual Selection II	Ch 12	Presentation 8	
	5	W	Life-History Evolution	Ch 14		
	10	M	Social Behavior I	Ch 13	Presentation 9	Review Draft Due
	12	W	Social Behavior II	Ch 15		
	17	M	The Origin of Life & Fossil Record	Ch 17	Presentation 10	Peer Review Due
	19	W	Diversity & Extinctions	Ch 18		
	24	M	Biogeography	Ch 18	Presentation 11	Final Paper Due
	26	W	NO CLASS – THANKSGIVING			
Dec	1	M	Human Evolution	Ch 20		
	3	W	Evolution & Society	Ch 21	Presentation 12	
	8	M	Review			
	12	F	FINAL EXAM: 3:30–6:00pm			