

**BIOL 306: Evolutionary Biology**  
**Fall 2023, 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 3:15–4:15pm and Friday 8:30–10:30am, 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:** Most classes 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 or lab 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. Concerns about academic performance, health situations, family health and wellness (including the loss of a loved one), interpersonal relationships and commitments, and other factors can contribute to stress. 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. For more information, see [http://www.geneseo.edu/dean\\_students](http://www.geneseo.edu/dean_students). Please see the Canvas 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**

Academic dishonesty includes cheating, knowingly providing false information, plagiarizing, and any other form of academic misrepresentation. 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. All work must be your own. You also may not use a large language model, such as OpenAI’s chatGPT, to edit or generate text because it is not guaranteed to be free from using the intellectual products of others. For the college’s fully policy, see: <https://www.geneseo.edu/handbook/academic-dishonesty-policy>

### **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](mailto: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 [sni.org](http://sni.org) to learn more about the community of more than 7,000 enrolled Indigenous Peoples.

DATE		TOPIC	READING	ASSIGNMENTS	
Aug	28	M	Evolution in Action	Ch 1.1	
	30	W	Historical Context of Evolution	Ch 1	
Sept	4	M	NO CLASS – LABOR DAY		
	6	W	Natural Selection & Adaptation	Ch 3	
	11	M	The Tree of Life	Ch 2	
	13	W	Phylogenetics	Ch 16	
	18	M	Macroevolution	Ch 19	
	20	W	Mutation & Variation	Ch 4	Student Presentation 1
	25	M	Genetics & Natural Selection	Ch 5	
	27	W	Genetic Drift	Ch 6	Student Presentation 2
Oct	2	M	Quantitative Traits	Ch 7	
	4	W	Evolution in Space	Ch 8	Student Presentation 3
	9	M	NO CLASS – FALL BREAK		
	11	W	Evolution of Genes & Genomes	Ch 10	Student Presentation 4
	16	M	Evo-Devo	Ch 11	<b>Paper Topic Due</b>
	18	W	Review		
	23	M	<b>EXAM 1</b>		
	25	W	Species & Speciation I	Ch 9	
	30	M	Species & Speciation II	Ch 9	Student Presentation 5
Nov	1	W	Sexual Selection	Ch 12	
	6	M	Social Behavior I	Ch 13	<b>Paper Outline Due</b>
	8	W	Social Behavior II	Ch 15	Student Presentation 6
	13	M	Life-History Evolution	Ch 14	
	15	W	The Origin of Life & Fossil Record	Ch 17	Student Presentation 7
	20	M	Major Transitions & Eras	Ch 17	
	22	W	NO CLASS – THANKSGIVING		
	27	M	Biogeography	Ch 18	
	29	W	Extinctions	Ch 18	<b>Paper Draft Due to Peers</b>
Dec	4	M	Human Evolution	Ch 20	Student Presentation 8
	6	W	Evolution & Society	Ch 21	<b>Peer Review Due</b>
	11	M	Review		
	13	W	<b>FINAL EXAM: 12:00–2:30pm</b>		<b>Final Paper Due</b>