

**Evolutionary Biology (BIOL 306) – Spring 2022**  
2:30-3:45 PM Tu/Th – ISC136

**Instructors:** Dr. Josie Reinhardt: ISC 349, [reinhardt@geneseo.edu](mailto:reinhardt@geneseo.edu)  
Dr. Sara Burch: ISC 358, [burch@geneseo.edu](mailto:burch@geneseo.edu)

**Office Hours:** Reinhardt: Weds 12-2, Thurs 10-12, on zoom: [geneseo.zoom.us/j/2611825805](https://geneseo.zoom.us/j/2611825805)  
Burch: Monday 9:30–11:30 AM and Wednesday 2:30–4:30 PM

**Textbook:** Evolutionary Analysis – Herron and Freeman (5<sup>th</sup> edition) Publisher: Pearson, ISBN 978-0-321-61667-8, [www.pearsonhighered.com/herron](http://www.pearsonhighered.com/herron)

**Course Description (from Course Bulletin):** An examination of the patterns and processes of evolution from the perspective of several subdisciplines within biology.

**"...Nothing in Biology makes sense except in the light of Evolution..."**

This elegant phrase was coined by Theodosius Dobzhansky, evolutionary geneticist, anti-eugenicist and educator. This course aims to demonstrate to biologists why this is the case, and to show the great explanatory and predictive power of Evolutionary Theory to every field of Biology - whether we investigate single bio-molecules for fractions of a second, or entire ecosystems over millions of years.

**Course Goals / Learning Objectives**

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

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

**Class Format:**

You are expected to complete assigned readings prior to class and come ready to discuss examples in the assigned reading. Weekly quizzes based on textbook readings are completed on Canvas prior to class. You will get half the quiz points for attempting each question, and half for correctness. Additional readings (e.g. journal articles, case studies, “labs”) will be assigned on the weekly canvas pages for use in-class. Each week, a student group will present primary literature 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.

**Grading:**

Quizzes & In-Class Participation: **20%**  
Student presentation: **20%**  
Two exams: **20%** each  
Final paper: **20%**

**Grading Scale:**

The following scale will be used to calculate final grades. The hundredths place is rounded.

	<b>B+</b> 87.0-89.9%	<b>C+</b> 77.0-79.9%		
<b>A</b> 93.0-100%	<b>B</b> 83.0-86.9%	<b>C</b> 73.0-76.9%	<b>D</b> 60.0-69.9%	
<b>A-</b> 90.0-92.9%	<b>B-</b> 80.0-82.9%	<b>C-</b> 70.0-72.9%	<b>E</b> <60%	

### Other Course Policies:

- **COVID safety:** If you have any symptoms or are otherwise sick DO NOT COME TO CLASS. Be in communication with your instructors and classmates as needed about making up material. If you begin feeling ill during class please let your instructor know and leave promptly. Please follow current college policies on mask use, social distancing, etc.
- **Exams:** Exams are to be taken on the day they are scheduled in the syllabus, so please check your schedule carefully and let us know if you have anything you know would conflict within the first week of class. Make-up exams are allowed for illnesses, significant emergencies, and other allowed events as described in the student handbook (e.g. religious observances, varsity sports, etc). Please reach out if you have any issues as soon as possible.
- **Accessibility and Disability:** 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 documented physical, emotional, or cognitive disabilities, as well as medical conditions related to pregnancy or parenting. Students with letters of accommodation should submit a letter to each faculty member at the beginning of the semester and discuss specific arrangements. Please contact the Office of Accessibility Services for questions related to access and accommodations: Erwin Hall 22, (585) 245-5112  
[access@geneseo.edu](mailto:access@geneseo.edu), [www.geneseo.edu/accessibility-office](http://www.geneseo.edu/accessibility-office)
- **Mental Wellness Policy:** We take mental health problems as seriously as we would issues with your physical health. Diminished mental health, including significant stress, mood changes, excessive worry, or problems with eating and/or sleeping can interfere with optimal academic performance. If the source of your symptoms is directly related to this class, please speak with us. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute to decreased academic performance. SUNY Geneseo provides mental health services to support the academic success of students. Counseling Services, a part of the Lauderdale Center for Student Health & Counseling, offers free, confidential psychological services to help you manage personal challenges that may threaten your well-being. Call 585-245-5716 to make an appointment and also see this page for [emergency resources](#). If you feel more comfortable talking to peers, Geneseo students also lead a peer counseling group called Pathways. [www.geneseo.edu/pathways](http://www.geneseo.edu/pathways)
- **Academic Dishonesty & Plagiarism:** Presenting others' work as if it were your own, or providing such help to others constitutes academic dishonesty. The format of this inappropriate help does not matter. This is important not only due to fairness, but also so that instructors can provide feedback that is useful to improving your understanding and skills (feedback on work that is not your own is not useful to anyone!). Of course, in the case of group work the product will include input from all members. Any work that you are presenting as your own *must be original to you*. If you're struggling in class, please ask for help rather than resorting to academic dishonesty! We're here to assist you if you have any concerns. SUNY Geneseo has instituted policies and procedures that must be followed in the event of an occurrence of Academic dishonesty which can be found here: [Academic Dishonesty](#): [https://www.geneseo.edu/dean\\_office/dishonesty](https://www.geneseo.edu/dean_office/dishonesty) ). Immediate consequences include a report to the department chair and Dean of the College and a loss of points on impacted assignment(s).
- **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.

- **We invite you to let us know how best to address you:** especially if this differs from what is on the official Canvas / Knightweb record.

**Preliminary Course Schedule and readings (subject to adjustments as required)**

<b>Date</b>	<b>Instructor</b>	<b>Topic</b>	<b>Reading</b>	<b>Assignments</b>
Jan 27	R Reinhardt	Introduction - Viral Evolution	Ch1	N/A
Feb 1	T Reinhardt	Microevolution	Ch2	
Feb 3	R Reinhardt	Macroevolution	Ch2	<b>Choose presentation topic/time</b>
Feb 8	T Reinhardt	Evolution by Natural selection: Darwin's postulates	Ch3	
Feb 10	R Reinhardt	Evolution by Natural selection: Challenges and extensions to theory	Ch3	Student presentation 1
Feb 15	T Reinhardt	Phylogenetic inference	Ch4	
Feb 17	R Burch	Speciation I	Ch16	Student presentation 2
Feb 22	T Burch	Speciation II	Ch16	
Feb 24	R Burch	The origin of life	Ch17	Student presentation 3
Mar 1	T Burch	The fossil record	Ch18	
Mar 3	R Burch	Extinctions	Ch18	Student presentation 4
Mar 8	T Burch	Evo-devo	Ch19	
Mar 10	R			Exam 1
		<b>Mar 15-17 : Spring Break</b>		
Mar 22	T Burch	Form & function	Ch10	<b><i>Term paper topic due</i></b>
Mar 24	R Burch	Sexual selection	Ch11	Student presentation 5
Mar 29	T Burch	Social behavior I	Ch12	
Mar 31	R Burch	Social behavior II	Ch12	Student presentation 6
Apr 5	T Burch	Life-history evolution	Ch13	<b><i>Term paper outline due</i></b>
Apr 7	R Burch	Evolution & You: Human evolution	Ch20	Student presentation 7
Apr 12	T Burch	Evolution & You: Human health	Ch14	
Apr 14	R Reinhardt	Nature of heritable variation	Ch5	Student presentation 8

Apr 19	T	Reinhardt	Selection and drift I	Ch6	(OPTIONAL) Term paper draft due to profs
Apr 21	R		GREAT Day		
Apr 26	T	Reinhardt	Selection and drift II	Ch6	
Apr 28	R	Reinhardt	Migration and conservation genetics	Ch7	Student presentation 9
May 3	T	Reinhardt	Linkage and sex	Ch8	<b>Term Paper Draft due to peers</b>
May 5	R	Reinhardt	Modes of selection	Ch9	Student presentation 10
May 10	T	Reinhardt	Molecular evolution	Ch15	<b>Peer review due</b> Popgen problem set due
May 12	R				Exam 2
<b>May 19</b>	<b>R</b>		<b>Group Discussion of papers</b>		<b>Final Term Paper due</b>