Evolutionary Biology (BIOL 306) – Fall 2020
Sec 01 – 1:00-2:15 PM M (cohort A) OR F (cohort B) – Newton 209

Instructor: Dr. Josie Reinhardt: ISC 349, (585)245-5413, reinhardt@geneseo.edu

Office Hours: Monday: 4-5PM, Tuesdays: 9-11AM, Fri: 3-4PM (all held online)

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

"...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) in a 1973 essay (https://www.jstor.org/stable/4444260). This course aims to demonstrate why this is the case, and to show the great explanatory and predictive power of Evolutionary Theory, and its relevance 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 Darwin's theory of evolution by natural selection ("Darwin's postulates"). Know what key elements his 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:

This course is using a hybrid "remote ready" format, with roughly half the time for direct instruction (this part will be done using asynchronous REMOTE instruction via videos and readings) and about half for discussion and IN-CLASS activities which will be done synchronously. In addition, the course has two long-term writing assignments with checkpoints throughout the semester. I will use Canvas heavily so please check it regularly for updates, which may include software you should install and make sure is working prior to class!

If you have concerns about attending in-person class/would prefer a remote-only model please let me know ASAP – I am considering an "online-only" Cohort for this course and am looking for student feedback on this concept.

You are expected to complete assigned readings and view lectures prior to class and come ready to discuss and participate in the activity on the topic. Weekly quizzes based on textbook readings, pre-class Lectures, and journal articles are to be completed on Canvas prior to coming 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 periodically assigned on the weekly canvas pages for use in-class.

Attendance and Public Health

In the context of the COVID-19 pandemic, it is vital that we all do what we can to protect the health and safety of one another. If you are feeling unwell on a day that you are scheduled to come 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. Throughout the semester be proactive in communicating about absences with me, and contact the Dean of Students if you expect to be gone for an extended period of time. There will be no penalty for missing class as I've designed the course so that there's a path for you learn what you need to know.

The college has developed an online COVID-19 screening report for students. Be sure to familiarize yourself with this process and complete the brief screening report **before leaving for class**. If you are experiencing common symptoms of COVID-19, stay home and contact Health and Counseling Services as soon as possible. I strongly encourage you to set a daily reminder to fill out the screening report.

Face masks are required in all instructional spaces and all common areas including residence halls and academic buildings. If you forget your mask, pick up a disposable one before entering any public space. Masks must be worn for the duration of class. If you do not have a mask or are unwilling to wear one, you will be asked to leave the classroom. I cannot safely hold class if all students are not wearing face masks. Students who have concerns about wearing a face mask due to a documented disability need to contact the Office of Accessibility Services (access@geneseo.edu) to request reasonable accommodations. Please familiarize yourself with any special seating arrangements in the classroom and be sure to practice 6-foot physical distancing at all times. This includes entering and exiting the classroom.

Grading:

14 Quizzes are worth 25% of your grade.
14 Assignments based on activities in-class are worth 25% of your grade.
A book review paper is worth 20% of your grade
A literature review paper & presentation is worth 30% of your grade
Details regarding all assignments will be found on Canvas.

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

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

Other Course Policies:

- Students with Disabilities: SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will be made for medical conditions related to pregnancy or parenting. Students should contact Dean Buggie-Hunt in the Office of Disability Services (tbuggieh@geneseo.edu or 585-245-5112) and myself to discuss such accommodations during the first week of class.
- It is a violation of student conduct policies at SUNY Geneseo to **present someone else's work as your own** – not to mention, it is also immoral and unfair. Confirmation of plagiarism will result in *at best* a grade of zero for the assignment in question. I am obligated to report all suspected plagiarism following procedures outlined in the school's academic dishonesty policy: https://www.geneseo.edu/dean_office/dishonesty
- Please let me know within the first week of class how to best address you!
- Students come to this course with diverse perspectives with regard to age, gender, race, sexual orientation, class, nationality, religion, & culture. Students are encouraged to share their personal point-of-view, and we will touch on how identity and beliefs have intersected with the science of evolutionary biology. However, as a course in Biology you can expect most of the class to be focused on discussing Evolution from a Biological perspective. If you have questions on these topics that we don't cover, I would be happy to discuss further with you one-on-one outside of class time (e.g. during office hours).

Preliminary Course Schedule and readings (Subject to change)

Date	Week	Pre-class REMOTE work (complete *before* class)	In-Class Activity (complete during/after class)	Long term project
Aug 31 (A) Sep 4 (B)	Week 1	Lecture 1 – Viral evolution H&F: Ch 1. Quiz 1 (note: for week 1 you may take the quiz after class)	Murder by HIV (Bring your LAPTOP) Discuss Book review	**Look at book list**
Sept 7		LABOR DAY – NO CLASS		
Sep 11 (B) Sep 14 (A)	Week 2	Lecture 2 – The Pattern of evolution H&F: Ch 2. Quiz 2.	Phylostrat Activity (Bring your LAPTOP)	**Book review:** Choose book
Sep 18 (B) Sep 21 (A)	Week 3	Lecture 3 – Darwin's Postulates H&F: Ch3. Quiz 3.	DISCUSSION: Addressing ID arguments	
Sep 25 (B) Sep 28 (A)	Week 4	Lecture 4 – Phylogenetic Analysis H&F: Ch4. Quiz 4.	Evodots Activity (Bring your LAPTOP)	
Oct 2 (B) Oct 5 (A)	Week 5	Lecture 5 – Heritable Variation H&F: Ch5. Quiz 5.	DISCUSSION: IQ, Heritability, and ancestry	**Book review:** *Optional* draft to professor
Oct 9 (B) Oct 12 (A)	Week 6	Lecture 6 – Selection and mutation H&F: Ch 6. Quiz 6.	PopG activity	**Book review:** Draft to peers
Oct 16 (B) Oct 19 (A)	Week 7	Lecture 7 – Drift and migration H&F: Ch 7. Quiz 7.	PopGen problems	**Book review:** Peer review due
Oct 23 (B) Oct 26 (A)	Week 8	Lecture 8 – Sex and evolution H&F: Ch 8. Quiz 8.	DISCUSSION: What is sex?	**Book review**: **Final** draft due
Oct 30 (B) Nov 2 (A)	Week 9	Lecture 9 – Testing adaptive hypotheses H&F: Ch 10 Quiz 9.	ARTICLE DISCUSSION: Spandrels of San Marco Discuss lit review	**Lit review:** choose topic/articles
Nov 6 (B) Nov 9 (A)	Week 10	Lecture 10 – Life History Evolution H&F: Ch 13 Quiz 10.	Life History Problems	
Nov 13 (B) Nov 16 (A)	Week 11	Lecture 11 – Sexual Selection H&F: Ch 11 Quiz 11.	ARTICLE DISCUSSION: Widowbirds	**Lit review:** *Optional* draft to professor
Nov 19 (B) Nov 23 (A)	Week 12	Lecture 12 – Social Behavior H&F: Ch 12 Quiz 12.	The Waiting Game Case	**Lit review:** Draft to peers
Nov 27		THANKSGIVING NO CLASS		
Nov 30 (A) Dec 3 (B)	Week 13	Lecture 13 – Speciation H&F: Ch 16 Quiz 13	CASE STUDY: As the Worm Turns	**Lit review:** Peer reviews due
Dec 7 (A) Dec 10 (B)	Week 14	Lecture 14 – The Origin of Life & Fossil Record H&F: Ch 17&18. Quiz 14		**Lit review:** Final draft due
Dec 14-Dec 19	Final week	**Final Presentations of papers**		

For Cohort "A" who will attend on **MONDAYs**, your prep work and quizzes will be due the night before class (**SUNDAY**). Your completed in-class assignment work is due **WEDNESDAY**.

For Cohort "B" who will attend on **FRIDAYs**, your prep work and quizzes will be due the night before class (**THURSDAY**). Your work following up on in-class assignments is due **MONDAY**.

For the long term assignments, these are due **FRIDAY** for everyone