



Class time and location: TuTh 1 – 2:15p (VIL 130)
Instructor: Dr. Sonal Singhal
Office hours: [REDACTED]
Office: [REDACTED]
Phone: [REDACTED]
E-mail: [REDACTED]

Course Description

It is easy to think we learned everything we needed to know about evolution by the time Darwin died, but nothing could be further from the truth. In this course, we will explore how modern approaches to studying evolution are teaching us new & surprising things about how evolution works, its power to help explain patterns in the natural world, and how evolution intersects with broader issues, like global change. This course is a paper- & discussion-based course. Outside of helping you learn about evolution, I am interested in helping you learn how to better write about and discuss challenging ideas in biology.

From the course catalog: Explores how modern approaches to studying evolution are teaching us new and surprising things about how evolution works and its power to help explain patterns in the natural world. This course is a paper-based, discussion-based course.

Prerequisites: Bio 124, Bio 340

Student Learning Objectives

After finishing this class, you should be able to:

- Describe how evolutionary forces act on variation in a population to lead to change through time
- Engage and direct your classmates in discussions of scientific ideas
- Better read and analyze scientific data and arguments
- Generate your own evolutionary hypotheses and experiments based on natural phenomena

Materials

Required Material: None!

Classroom Policies

Come to class ready to learn. This means arrive on time, don't have distracting side conversations, and avoid using your phone when I am lecturing or we are having class discussions. When you can, let me know if you must miss class. Because this is a discussion-based class, it will work best when we can all be here.

Grading	
Question sets:	0 points
Presentations:	0 points
Participation:	0 points
Total:	0 points

Question sets: For each paper, I will assign a set of questions; there will be anywhere from 5 – 10 questions. I will give you guidance on how long your answers should be for these questions. The purpose of these question sets is to guide you through the reading and to prepare you for discussion. You may discuss these questions with your classmates but your answers must be your own. You will submit these before class starts. The weeks you are presenting, you can do the question set if it would help you but it is not required.

Presentations: Each of you will be required to lead two paper presentations throughout the semester. Each discussion will be led by two or three students; you will get to choose which presentations you lead, though it will be first-come, first-serve. As the leader, you oversee presenting the paper through a short introduction (~15 minutes). You will also submit to me by e-mail (ssinghal@csudh.edu) five questions for discussion by 6p on the Monday before your presentation. I will then use the questions you wrote, the question set questions, and my own questions to lead a discussion among the class. As the presentation leaders, I expect you to participate in the discussion.

Participation: to me is about quality not quantity. What matters most is helping keep the discussion moving, whether that means answering a question that was posed, presenting a new question, exploring how the study is relevant to other ideas, etc. You do not have to “have the answer” to participate. A good question can do a lot more for a discussion than “the answer”.

Extra credit: No extra credit will be given in this class.

Why all the assignments are worth 0 points: This is an ungraded class, which means you will be deciding your grade in the class in collaboration with me. We will discuss why we are doing this and how it will work in class. For now, the most important thing to remember is that letter grades still mean the same as they would in a more standard class: an A, B and C reflect excellent, good, and passing work, respectively. You need a C or higher to pass this class.

Recommendations for Success

To be successful in class, I recommend:

- **Reading each paper at least twice.** Reading scientific papers is not easy. I regularly read papers two or three times to make sure I understood what I read. Please give yourself the time to read each paper more than once.
- **Do the question sets with your friends.** Teamwork makes the dream work! You need to submit your own answers, but I encourage you to discuss your answers with each other before you submit them. This material is tricky, and collaborating can help you find the right answers.
- **Preparing for your presentation ahead of time so that you can get my feedback.** I will happily look over your slides (email them to me or come see me in office hours) to give ideas and notes on how you can improve.
- **Come to class & participate once you show up.** Remember: participating does not mean you need to have the right answer. Asking a question can help move discussion forward a lot. And trust me: if you think a question is “dumb”, at least two other people in the room have the same question.
- **Contact me when life gets complicated** and focusing on school becomes hard. You don’t need to tell me what is going on, but you do need to tell me that you need extra support or time to finish up the class.
- **Have fun!** We are doing an ungraded class because research shows it allows students to focus less on stressing about their grade and focus more on learning.
- **Come visit me in my office, SCI 210.** Chatting one-on-one can be easier than chatting in class, and sometimes, focused attention can help resolve sticky points in a writing assignment.
- **Go to the Writing Center.** The Writing Center on campus (<https://www.csudh.edu/writing-center/>) offers one-on-one consulting meetings to help you on presentations and other written work.
- **Be thoughtful about what presentations & topics you pick.** I have built some flexibility into this class in terms of which papers you present on & the final project. Take advantage of this flexibility to pick topics and ideas of interest to you.

Weekly Schedule

Each week in class covers a different topic in evolution. Each week is set up the same way, because it makes it easier for me and you. Here’s a diagram of how it works.

BEFORE THURS. Review lecture PPT (posted on Canvas)	THURSDAY Attend Lecture 1 - 2:15p	BEFORE TUESDAY Read paper (posted on Canvas)	TUESDAY Turn in questions By 1p on Canvas	TUESDAY Class Discussion 1 - 2:15p
---	---	--	---	--

Tentative Schedule			
Date	Question	Assessment	Discussion Leader
Tue., Aug. 29	Class introduction		
Thu., Aug. 31	How do we read a paper?		
Tue., Sep. 5	Discussion: Bush et al. 2019	Questions 1	Sonal
Thu., Sep. 7	How do we study evolution? (Genomics)		
Tue., Sep. 12	Discussion: Campbell-Staton et al. 2021	Questions 2	Sonal
Thu., Sep. 14	How do we study evolution? (Phylogenies)		
Tue., Sep. 19	Discussion: Springer et al. 2001	Questions 3	Sonal
Thu., Sep. 21	Where does variation come from?		
Tue., Sep. 26	Discussion: Feldman et al. 2009	Questions 4	Ku'Miya, Eillen, Emmarie
Thu., Sep. 28	Can we rescue species from extinction 1?		
Tue., Oct. 3	Discussion: Riley et al. 2014	Questions 5	Liz, Ashley, Manny
Thu., Oct. 5	Can we rescue species from extinction 2?		
Tue., Oct. 10	Discussion: Khan et al. 2021	Questions 6	Kashanti, Gio, Hallie
Thu., Oct. 12	How do species evolve to changing conditions?		
Tue., Oct. 17	Discussion: Donihue et al. 2018	Questions 7	Anabel, Itzel, Isabel
Thu., Oct. 19	Why are some adaptations harder to evolve than others?	Mid-semester assessment	
Tue., Oct. 24	Discussion: Freedman et al. 2020	Questions 8	Gaby, Kevin, Gio
Thu., Oct. 26	Can species evolve out of extinction?		
Tue., Oct. 31	Discussion: Corl et al. 2018	Questions 9	Hallie, Emmarie, Katy
Thu., Nov. 2	Why sex?		
Tue., Nov. 7	Discussion: Morran et al. 2011	Questions 10	Kevin, Ku'Miya, Eillen
Thu., Nov. 9	What explains peacock's tails and frog calls?		
Tue., Nov. 14	Discussion: Halfwerk et al. 2019	Questions 11	Angela, Ashley, Manny
Thu., Nov. 16	How do new species form?		
Tue., Nov. 21	Discussion: DiVittorio et al. 2020	Questions 12	Katy, Isabel
Thu., Nov. 23	NO CLASS – THANKSGIVING HOLIDAY		
Tue., Nov. 28	How do species co-evolve?		
Thu., Nov. 30	Discussion: Agrawal & Fishbein 2008	Questions 13	Anabel, Itzel, Kashanti
Tue., Dec. 5	Why are there so many species of beetles?		
Thu., Dec. 7	Discussion: Freeman et al. 2022	Questions 14	Liz, Angela, Gaby
Tue., Dec. 12	Final Self-Assessment Due		

University Policies

Academic Integrity: This course will be conducted in accordance with the University Policy on Academic Integrity (p.14 University Catalog). Any student caught cheating or plagiarizing will receive an F (0 points) on the assignment and will be penalized according to University regulations. Cheating or plagiarism is subject to discipline as provided in Title 5, California Code of Regulations. Plagiarism is a very serious offense. See the University Catalog under Academic Integrity for further information.

Exams: no cellphone use of any kind is allowed during exams. Cellphones will be turned off and secured in your bookbag, which will be placed on the floor for the duration of the exam.

Plagiarism: it is imperative that you cite all your sources on assignments. Academic misconduct of any kind, including cheating on exams and plagiarism, will result in a grade of F for the course, and possibly other sanctions. Once you have completed this course, do not share assignments etc. with students in subsequent semesters. If anyone turns in your assignment in a future semester, you will be held accountable and face sanctions.

Disruptive Students: Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. The instructor may require a student responsible for disruptive behavior to leave class pending discussion and resolution of the problem and may report a disruptive student to the Student Affairs Office (WH A-410, 310-243-3784) for disciplinary action.

CSUDH adheres to the Americans with Disabilities Act with respect to providing reasonable accommodations for students with temporary and permanent disabilities. To receive accommodations, students with disabilities must register with Students disAbility Resource Center. For more information, please contact their office in Welch Hall D-180 at (310) 243-3660 (voice) or (310) 243-2028 (TDD).

Computer/Information Literacy Expectations for Students enrolled in this class: Students in this class are expected to:

- Use assigned Toromail account or other university approved email.
- Have ability to navigate and use Canvas.
- Have basic information and computer literacy in one of the computer formats (Windows, Macintosh, or GNU/Linux).
- Upload files in all of the computer formats (.doc, .docx, .jpeg, .ppt, .pdg, .xps).
- Access and choose appropriate library and other scholarly sources of information.
- Search for and find relevant scholarly information effectively.
- Be able to paraphrase concepts without plagiarizing.
- Maintain the minimum computer Hardware requirements*
- Maintain the minimum computer Software requirements*

*Please visit <http://www.csudh.edu/academic-technology/instructional-technologyresources/online-courses-tech/> for the most up-to-date Hardware & Software computer requirements