

Biology 4400-001 Evolution

Spring 2020 Syllabus

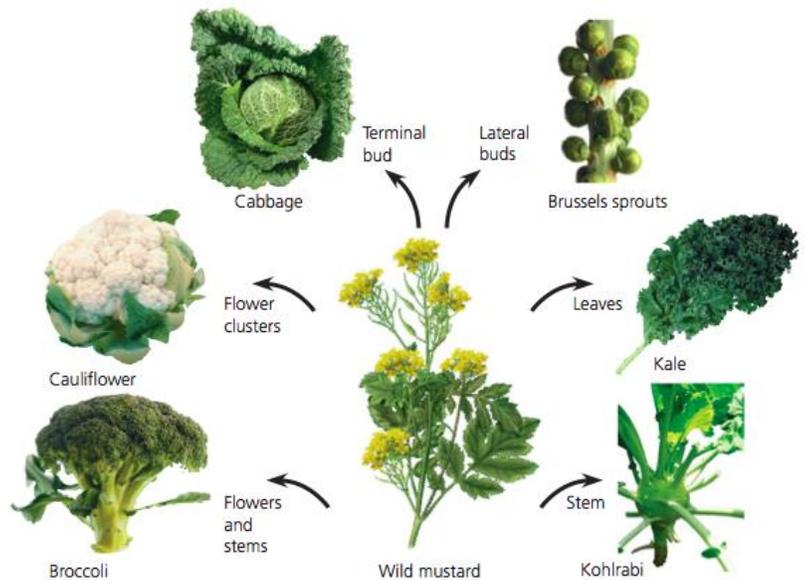
Lecture: M/W/F 1-1:50pm
Science 135
Professor: Andrew Gardner (he/him)
Email: agardner1@csustan.edu
Office: N261
Office Hrs: M/W noon-1pm, T 1-2pm.

Prerequisite

BIOL 3350 (Introductory Genetics) with a grade of C- or better.

Class resources

I suggest that you acquire *Evolution* (fourth edition), by Futuyma and Kirkpatrick. It is an excellent textbook on the material, and my lectures will closely follow its topical structure. I may include additional readings or other materials associated with activities. Please check the Blackboard page for posted lectures, announcements, and other information.



Humans have artificially selected many cultivars of *Brassica oleracea* all around the Mediterranean.

You can earn credit for attending and participating in lectures by using a registered iclicker. You can get one at the bookstore or another venue, and register it through blackboard.

Course description

Evolution by natural selection is foundational to contemporary biology and impacts our daily lives in profound ways. Biology 4400 is a lecture-based course that explores evolutionary biology, including the history of the field, how evolution works and what that means about its products. The class will also cover phylogenetics, macroevolutionary trends, and the recent history of our own lineage.

Major learning objectives:

1. Students will be able to distinguish between different processes (with evidence and examples of these processes) that lead to evolutionary change in organisms (i.e., natural selection, mutation, recombination, gene flow, genetic drift, sexual selection).
2. Students will be able to communicate the relevance of evolution to health, agriculture, forensic science, conservation, human origins, & even thoughtful consumerism.
3. Students will be able to communicate examples of evidence for evolution from genetics, biogeography, paleontology, comparative anatomy, biochemistry, molecular biology & physical anthropology.
4. Students will be able to construct an historical timeline of people, places & events that shaped understanding & development of the modern theory of evolution & its processes.
5. Students will be able to demonstrate knowledge of relationships between evolution & biological diversity through scientific understanding of common ancestors & phylogenetic relationships of fossils & living organisms (i.e., "tree thinking") and speciation events.
6. Students will have enhanced understanding of the peer-reviewed literature in science, its decentralized, cumulative, self-correcting, & hypothesis-testing features, & be able to distinguish it from pseudoscience, such as "creation science" & intelligent design.

Assessment

To do well in BIOL 4400, you will need to come to class and participate. Additionally, you'll need to contribute to group projects in and out of class. Attendance in class is expected, as is active participation. iclickers are a way to earn points (50) via attendance.

Throughout the semester, we will have class periods with activities, including graphing, phylogeny construction and interpretation, paper summaries, blog posts, and even a skit. These account for 165 points.

Quizzes and exams are opportunities for you to convince me you know the material. In an exam, you need to articulate a correct answer. If you haven't articulated an answer previously (practicing in a study group, writing it, etc.,) you will have a more difficult time doing it during exam time. Exams will cover the concepts from lecture and lab, and will mostly be multiple choice with matching, short answer and/or diagram questions. Quizzes account for 45 points and exams for 190.

You may not leave the room during an exam without my permission. You must turn off cell phones and remove your hats during exams. If you arrive late, after someone has finished the exam and left the room, you will not be able to take the exam.

You need to notify me prior to missing any exam. I rarely administer exams early, but if you have a serious extenuating circumstance, we may be able to make an arrangement as long as that request is accompanied by a note from a reliable source (see above). A makeup exam will not necessarily be given. If an emergency suddenly arises causing you to miss an exam, it is your responsibility to notify your instructor via phone or email as soon as practical. Hospitalization, death of a family member, or other serious events would be valid reason for missing an exam without prior notification. Documentation for why you missed the exam is required if you want to take a make-up exam. Make-up exams are different than the regular exams given to the rest of class.

Late material will lose 25% for each day missed after the deadline. Make-up and late work for the class is possible, but only with an excuse note from some reliable person (hospital, police, etc). You must make arrangements with me to take care of any work needed to be made up. I'll probably make a couple of mistakes along the way. If you think I've graded something incorrectly, send me an email and tell me about it and I'll make sure it's right. However, I do have a statute of limitations on regrades: one week from when I return them. February 21 is the census date, which is the last day to drop or add a class. Consult with your advisor before making your decision.

Grades are based on the percentage of total points earned, and are not "curved."

A	93-100%	C+	77-79%	D-	60-62%
A-	90-92%	C	73-76%	F	0-59%
B+	87-89%	C-	70-72%		
B	83-86%	D+	67-69%	CR	70-100%
B-	80-82%	D	63-66%	NC	0-69%

The schedule is subject to change and will be updated as needs arise.

Date	Activities	Chapters	Assessment	Pts
M 27-Jan	syllabus, introductions			
W 29-Jan	history of evolutionary biology, tree of life	1, 2 (16)		
F 31-Jan	<i>interpret a tree activity</i>		product	10
M 3-Feb	natural selection	3		
W 5-Feb	variation	4		
F 7-Feb	genetic models	5	Q1 available	15
M 10-Feb	Phenotypic evolution	6		
W 12-Feb	<i>graphing activity for selection models</i>		product	10
F 14-Feb	flex day			
M 17-Feb	Exam 1		Exam 1	50
W 19-Feb	drift	7		
F 21-Feb	Gene flow	8		
M 24-Feb	Speciation I	9		
W 26-Feb	Speciation II			
F 28-Feb	<i>paper 1</i>		participation	20
M 2-Mar	Sex	10		
W 4-Mar	Fitness	11		
F 6-Mar	Intraspecific interactions	12		
M 9-Mar	Interspecific Interaction	13		
W 11-Mar	<i>Interaction skits activity</i>		participation	10
F 13-Mar	Evolution of genes	14	Q2 available	15
M 16-Mar	flex day			
W 18-Mar	flex day			
F 29-Mar	Exam 2		Exam 2	60
M 23-Mar	SPRING BREAK			
W 25-Mar	SPRING BREAK			
F 27-Mar	SPRING BREAK			
M 30-Mar	Evo-Devo	15		
W 1-Apr	Phylogenetics I	16		
F 3-Apr	Phylogenetics II			
M 6-Apr	<i>build a tree</i>		product	10
W 8-Apr	History of life on Earth	17		
F 10-Apr	Geographic evolution	18		
M 13-Apr	<i>paper 2</i>		participation	20
W 15-Apr	Evolution of biodiversity	19		
F 17-Apr	<i>Blog post project introduction</i>		participation	5
M 20-Apr	Macroevolution I	20		
W 22-Apr	Macroevolution II			
F 24-Apr	<i>Pitch meeting</i>		peer evaluation	10
M 27-Apr	Hominin evolution	21		
W 29-Apr	Evolution and Society	22		
F 1-May	flex day		Q3 available	15
M 4-May	Project working day			
W 6-May	<i>flex day, first drafts due</i>		first drafts due	20
F 8-May	WARRIOR DAY (no class)			
M 11-May	<i>paper 3</i>		participation	20
W 13-May	flex day, <i>blog posts due</i>		final drafts due	30
F 15-May	flex day			
F 22-May	Exam 3, 11:15am-1:15pm		Exam 3	80
			Clicker % * 50	50
			Total	450

Expectations related to the learning environment

Students

- a. I expect students to actively participate in class discussion, group activities, and peer-peer teaching.
- b. I expect students to be prepared for class each day.
- c. I expect students to respect each other, me, the environments in which we'll operate, and themselves.
- d. I expect students will not cheat, but if students do so, they will not be surprised by an automatic F for the assignment or a referral to the appropriate disciplinary committee. Cheating is "submitting an in-class assignment for a student who is not present or submitting work that is not your own, but claiming that it is your own original work." Lying is "communication with intent to deceive" and cheating falls into that category.
- e. Please don't allow your phones to distract you from class. Please restrict your computer and internet usage to relevant classroom activities to keep from distracting your classmates or me.
- f. Please discuss with me any circumstances or accommodations you would need so we can ensure that the class is an environment in which you can learn and have fun. Please do so within the first full week of class, but don't hesitate to talk to me at any time about anything that is impeding your success in class.
- g. Plan ahead and keep up with the assignments; and don't hesitate to talk to or email me if you're having a hard time doing so.
- h. Through this course, we will foster a sense of community as we learn to be better communicators, critical thinkers and citizens. To do this, we must all work to make our class a welcoming and productive place to learn for everyone, regardless of race, ethnicity, sexual orientation, gender identity, age, size, socioeconomic background, religion, spirituality, physical ability, mental ability, or any other aspect of one's identity.

Professor

- a. I will come to class prepared to teach an informative lecture containing information relevant to the learning objectives.
- b. I will strive to help you prepare for your exams by giving you 'signposts' along the way to focus your study.
- c. I will not purposely be sneaky on quizzes or exams, but I have high expectations of everyone, including myself.
- d. I will answer questions respectfully and will begin and end class on time.
- e. I will set policy and strive to be fair to all students.
- f. I will return assignments/tests promptly with useful comments.
- g. I enjoy writing letters of recommendation. Because they are letters of recommendation I do like to be able to recommend the candidate. If you do think you will need a letter from me, make sure you work hard in this class and communicate with me.

TUTORING ON CAMPUS – Free tutoring services are available to assist you in most disciplines, including in biology! - (currently in Annex) - (209) 667-3642 - www.csustan.edu/Tutoring

CAMPUS COUNSELING SERVICES – Overwhelmed by the stress of juggling classes and your home life? Our campus offers excellent counseling services to help support you! - MSR 210 - (209) 667-3381 - www.csustan.edu/Counseling/

STUDENT HEALTH CENTER – You have already paid for access to health care on campus. Services include: birth control, flu shots, immunizations, pharmacy, check-ups, HIV testing, TB tests, and doctor's notes for when you are sick! - (209) 667-3396 - healthcenter.csustan.edu

ALSO: The Commons, Student Support Services (MSR 230), The Biology Student Association and other student orgs, etc.