

SYLLABUS FOR BIOLOGY 105: EVOLUTION

<p>Spring 2022</p>	<p>Department of Biology California State University, Fresno</p>
<p>Course Name: Biol 105</p>	<p>Instructor: Dr. Emily Walter (she/hers)</p>
<p>3 Units</p>	<p>Office: Science 1 Room 218 or Lab School 125</p>
<p>Time: MWF 1:00-1:50 PM</p>	<p>E-Mail: ewalter@csufresno.edu</p> <p>Weekdays: expect a response in 24 hours; Weekends: expect a response Monday</p>
<p>Room: IT 290 (in-person) and on Zoom at Room 817 2549 9228, Password BIOL105 (Fresno State Log-In Required).</p> <p>Our class is “Hybrid 2”, which means 67-99% of our class periods will be online, but there are some required face-to-face instructional activities.</p>	<p>Telephone: Email is Best</p>
<p>Website: To access the course, log in to Canvas (https://fresnostate.instructure.com/) using your Fresno State username and password</p>	<p>Office Hours: Office hours are booked using the Calendly app. I have appointments available throughout the week, including same-day drop-in meetings.</p> <p>If you do not find a time using Calendly, <i>please talk to me before or after class or by email.</i></p> <p>https://calendly.com/dremilywalter</p>

The following sections regarding COVID are subject to change given changing circumstances on-campus and in the community. Please check the COVID website for the most up-to-date information at: www.fresnostate.edu/coronavirus

Vaccination: All Students who access Campus/Programs must be Fully Vaccinated (including the booster dose when eligible to receive it) by Feb. 28, 2022. Students may attest to a Medical or Religious Exemption from the vaccine policy requirement in accordance with CSU and campus procedures. Students should go to the Student Portal to update their COVID self-certification form and vaccine documentation. Requests for exemptions can be found there. You are not to come to campus if any of the following are true:

- You have not received an Approved Vaccine and are not considered fully vaccinated, and you have not attested to a medical or religious exemption.
- You have attested to an exemption from the vaccine requirement, but you have not completed your mandatory weekly COVID-19 test.

Health Screening: Students who come to campus and/or are participating in off-campus in-person experiential learning will be required to complete a [daily health screening](#) before coming to campus or learning site. You are NOT allowed to come to campus if any of the following is true:

- If you have experienced COVID-19 symptoms (vaccinated or not).
- If you have tested positive within the past 10 days.
- If you have had close contact (less than 6 feet for longer than 15 minutes) with someone confirmed to have COVID-19 within the past 14 days.

Please complete the campus [online reporting form](#). A campus official will reply to provide guidance and information.

Safety Measures: Face coverings are required to be worn indoors on-campus and during in-person classes (vaccinated or not), and/or in accordance with learning site requirements if participating in off-campus experiential learning, to reduce the risk of community spread of COVID-19. The [Student Health and Counseling Center](#) has complimentary masks available for students who need them. Good hygiene of hand washing for a minimum of 20 seconds or using hand sanitizer is required. Please avoid touching your face with unclean hands.

Please see university website for the most updated information:
www.fresnostate.edu/coronavirus

Please remember that the same student conduct rules that are used for in-person classroom instruction also apply for virtual/online classrooms. Students are prohibited from any unauthorized recording, dissemination, or publication of any academic presentation, including any online classroom instruction, for any commercial purpose. In

addition, students may not record or use virtual/online instruction in any manner that would violate copyright law. Students are to use all online/virtual instruction exclusively for the educational purpose of the online class in which the instruction is being provided. Students may not re-record any online recordings or post any online recordings in any other format (e.g., electronic, video, social media, audio recording, web page, internet, hard paper copy, etc.) for any purpose without the explicit written permission of the faculty member providing the instruction. Exceptions for disability-related accommodations will be addressed by Student Disability Services working in conjunction with the student and faculty member.

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Course Description

Course Description: Evolutionary processes and patterns. Integrates core concepts from genetics, ecology, and cell biology to explore how populations of organisms change over time. Required of all biology majors, and satisfies the senior major requirement for the B.S. in Biology.

Prerequisites for the course: Biol 101, 102, and 103. Senior standing or permission of instructor.

REQUIRED COURSE MATERIALS

REQUIRED TEXT: Darwin, C.R., & Wallace, A.R. (1858). On the tendency of species to form varieties, and on the perpetuation of varieties and species by natural means of selection. *Journal of the Proceedings of the Linnean Society of London, Zoology*. Available online at: http://darwin-online.org.uk/converted/pdf/1858_species_F350.pdf (and text online at: <http://darwin-online.org.uk/content/frameset?itemID=F350&viewtype=text&pageseq=1>)

OPTIONAL COURSE MATERIALS

TEXTBOOK: Bergstrom, C.T. & Dugatkin, L.E. (2011). *Evolution, 2nd edition*. Morton Publishing, ISBN 978-0-393-93793-0. Other editions are similar, although some material has been moved between chapters—consult the instructor if you can't find particular content.

In addition, I will require you to use Canvas to obtain other required and optional course materials.

Course Specifics

Summary/outline of the course: Biology 105 is an introduction to evolutionary biology. The course is a survey of evolutionary processes that occur at the population level, speciation, and evolutionary patterns among species and higher-level taxa. The emphasis of the course is on evolutionary theory elaborated through empirical data and examples. Evolutionary history of specific lineages (humans, for example) is only briefly covered in this course.

Course goals: To introduce students to the breadth and scope of evolutionary biology, and reinforce their knowledge of other biological disciplines (ecology, genetics, molecular and cell biology) from an evolutionary perspective. Additionally, to enhance analytical skills and characteristics required of graduates, including information literacy, quantitative analysis and reasoning, and scientific writing and argument skills.

Student Learning Outcomes:

The student who has mastered this course will be able to:

1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. *Assessment Boundary: Assessment DOES include other mechanisms of evolution, such as genetic drift, gene flow through migration, and co-evolution.*
3. Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. *Assessment does include allele frequency calculations.*
4. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.
5. Construct an explanation based on evidence for how natural selection leads to adaptation of populations
6. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
7. Read and analyze a phylogenetic tree that documents evolutionary relationships.

Course requirements/assignments: Examinations will include weekly homework and three exams (each covering a third of the class). Lecture examinations will be based mostly on material covered in our live class periods. For all exams, expect short answer, definition, and essay questions as well as multiple choice questions.

Participation and homework points are awarded for engagement in group in-class activities (in which students may participate synchronously or asynchronously) and homework exercises covering phylogenetics, population genetics, and quantitative genetics (in the second and third parts of the class).

Grading policy: I do not adjust letter grades to a curve. I also do not “boost” grades at the end of the semester, the points you earn are the points you earn. Letter grades correspond with the following percentiles:

A \geq 90%; B \geq 80%; C \geq 70%; D \geq 60%; F < 60%

Assignment and Examination Schedule

Due Date	Assignment	Points per Assignment	Total Points (%)
48 hours after class time; By 1 PM Tuesday, Thursday, or Sunday	In-Class Activities	3	120 (20%)
Most Sundays by 11:59PM	Homework Assignments	20	180 (30%)
Mon., Feb 28	Midterm 1 Exam	50	50 (8.33%)
Fri, Apr. 8	Midterm 2 Exam	50	50 (8.3%)
Mon, Mar. 14, 11:59PM	Evolution Inquiry Project Draft	30	30 (5%)
Fri., Mar. 25, 11:59PM	Project Peer Reviews	20	20 (3.3%)
Mon, May 9, 11:59PM	Evolution Inquiry Project	100	100 (16.6%)
Mon, May 16, 1:15-3:15 PM	Final Exam	50	50 (8.3%)
	Total		600 (100%)

COURSE POLICIES

Late work and make-up work policy. Given that students may have extenuating circumstances due to COVID-19, I will be as flexible as possible with late work and make-up work. If you miss completing an assignment by the due date and are able to provide to the instructor sufficient convincing evidence of extenuating (as determined by the instructor) serious personal illness or death in the family, you may elect to schedule a make-up assignment within five business days of the original assignment and at the convenience of the instructor. Due to the format of assignments in this course, you are not guaranteed that the format or content of a make-up assignment will be identical to the original assignment.

Study Expectations: It is usually expected that students will spend approximately 2 hours of study time outside of class for every one hour “in class” (i.e., watching recordings). Some students may need more outside study time and some less. Since this is a 3-unit class, you should expect to study or being doing homework for an average of 6 hours outside of “class” each week. For some students this may be less, and for others more.

Communication: If possible, contact me through Canvas or directly by email for any administrative issues, and bring content-related questions to Office Hours. I will be posting all course-related notices on Canvas; when an announcement is particularly important or urgent, you will receive an e-mail notification at your Fresno State e-mail account.

Plagiarism Detection: The campus subscribes to Turnitin, a plagiarism prevention service, through Canvas. You will need to submit written assignments to Turnitin. Student work will be used for plagiarism detection and for no other purpose. The student may indicate in writing to the instructor that he/she refuses to participate in the plagiarism detection process, in which case the instructor can use other electronic means to verify the originality of their work. **Turnitin Originality Reports WILL be available for your viewing.**

If there are questions or concerns that you have about this course that you and I are not able to resolve, please feel free to contact the Chair of the department to discuss the matter.

Chair's name: Jason Bush
Department name: Biology
Chair's email: jbush@csufresno.edu
Department phone number: 559-278-2001

UNIVERSITY POLICIES

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

The following University polices can be found at:

- [Adding and Dropping Classes](#)
- [Cheating and Plagiarism](#)

- [Computers](#)
- [Copyright Policy](#)
- [Disruptive Classroom Behavior](#)
- [Honor Code](#)
- [Students with Disabilities](#)
- [Title IX](#)

UNIVERSITY SERVICES

The following University services can be found at:

- [Associated Students, Inc.](#)
- [Dream Success Center](#)
- [Learning Center Information](#)
- [Student Health and Counseling Center](#)
- [Writing Center](#)

CREATING AN ENVIRONMENT FOR ALL PEOPLE

This class will be conducted in an environment that is open, welcoming, and safe to all students. The instructors are willing and committed to providing an atmosphere of support and affirmation for all people. **Do not display disrespectful behavior toward any individual** based upon age, ability, race/color/ethnicity, religious/spiritual, political affiliation, socioeconomic, immigration, marital, military/veteran status, gender identity/expressions, sexual/affectional orientations, relationship status, and/or anything that is likely to be perceived as disrespectful to someone's background, culture, or identity. For instance, some derogatory, but commonly used language includes 'that's gay' or 'that's retarded.' Unprofessional, derogatory, and/or offensive behavior may result in disciplinary action. Congratulations, you have found an extra credit opportunity! Good work reading the entire syllabus. If you email Dr. Walter a picture of a blue whale, preferably a super cool one, before February 1st, you will receive 5 extra credit points to your final grade.

SUPPORT FOR STUDENT PARENTS

Should you have difficulty with obtaining childcare on a given day, *you are welcome to bring your child with you to virtual or in-person class.* I trust you to know whether you can successfully bring your child to class and have them nearby. From my perspective, your child is welcome to attend and (a) participate or (b) do other activities, such as read, watch videos (with headphones), play video games, color, etc. Children who attend in-person class are expected to complete the University Health Screening and wear a mask if over the age of 2.

If you are breastfeeding and need to step out, please feel free to do so. However, since our class is only 50 minutes long, we do not have any scheduled breaks. Should you miss part of class time based on this need, we will work on finding a way to summarize what you missed.

If there is anything else I can do to support you as a parent, please let me know.

CHEATING AND PLAGIARISM (Extra detail for this course):

In this course, if a student is guilty of an act of cheating or plagiarism, they will receive 0 (zero) for the assignment. A second instance of cheating or plagiarism will result in an F grade for the course. In both cases, a report will be filed with the Dean of Student Affairs.

SUBJECT TO CHANGE STATEMENT

This syllabus and schedule are subject to change in the event of extenuating circumstances.

Tentative Course Schedule

This schedule is subject to change for extenuating circumstances and to adjust the topics and learning goals based on student needs. Dates for in-person instruction will be finalized after we determine that it is safe and comfortable for us to have effective in-person lessons.

	Date	Topic	Assignment
1	Fri., Jan. 21	What is Evolution / Course Overview	Read Course Syllabus
2	Mon., Jan. 24	Evolution, Evidence, & Nature of Science	
3	Wed., Jan. 26	Intro to Natural Selection	
4	Fri., Jan. 28	Mechanisms of Natural Selection	HW1 due Sun 1/30 11:59 PM
5	Mon., Jan. 31	Intro to Speciation	
6	Wed., Feb. 2	Examples of Speciation	
7	Fri., Feb. 4	Additional Examples of Speciation	HW2 due Sun 2/3 11:59 PM
8	Mon., Feb. 7	Early Evolutionary Ideas and Darwin	
9	Wed., Feb. 9	Darwin and Wallace	
10	Fri., Feb. 11	Darwin Day Celebration	HW3 due Sun 2/13 11:59 PM
11	Mon, Feb. 14	Evidence for Evolution in Fossils	
12	Wed., Feb. 16	Evidence in Artificial Selection	
13	Fri., Feb. 18	Evidence in DNA & Vestigial Traits	HW4 due Sun 2/20 11:59 PM
--	Mon., Feb 21	HOLIDAY – Presidents’ Day	
14	Wed., Feb 23	Evolution Evidence Wrap Up	
15	Fri., Feb 25	Evolution Myth Busting	No HW, study for Midterm
---	Mon., Feb 28	Midterm 1	Exam will be held in-person
16	Wed., Mar 2	Shared Biochemistry	

	Date	Topic	Assignment
17	Fri., Mar 4	Shared Biochemistry	Rest Weekend; No HW
18	Mon., Mar 7	Arguments in Shared Biochemistry	
19	Wed., Mar. 9	Common Ancestry	
20	Fri., Mar. 11	Phylogeny and Evolutionary History	HW5 due Sun 3/13 at 11:59 PM
21	Mon., Mar. 14	Phylogeny and Evolutionary History	
22	Wed., Mar. 16	Inferring Phylogeny	
23	Fri., Mar. 18	Inferring Phylogeny	HW6 due Sun 3/20 at 11:59 PM
24	Mon., Mar. 21	Heredity / Transmission Genetics	
25	Wed., Mar. 23	Heredity / Transmission Genetics	
26	Fri., Mar. 25	Heredity / Transmission Genetics	HW7 due Sun 3/27 at 11:59 PM
27	Mon., Mar. 28	Hardy-Weinburg Intro	
28	Wed., Mar. 30	Population Genetics	
29	Fri., Apr. 1	Population Genetics	HW8 due Sun 4/3 at 11:59 PM
30	Mon., Apr. 4	Violations of Hardy-Weinburg	
31	Wed., Apr. 6	Violations of Hardy-Weinburg	
--	Fri., Apr. 8	Midterm 2	Exams are in-person
--	Mon., Apr. 11	HOLIDAY – SPRING BREAK	No Class
--	Wed., Apr. 13	HOLIDAY – SPRING BREAK	No Class
--	Fri., Apr. 15	HOLIDAY – SPRING BREAK	No Class
32	Mon., Apr. 18	Violations of Hardy-Weinburg Wrap Up	
33	Wed., Apr. 20	Polygenic Traits / Quant Genetics	

	Date	Topic	Assignment
34	Fri., Apr. 22	Polygenic Traits / Quant Genetics	HW9 Due
35	Mon., Apr. 26	Polygenic Traits / Quant Genetics	
36	Wed., Apr. 28	Evolution of Sex and Sexual Selection	
37	Fri., Apr. 30	Species, Speciation, and Sex	
38	Mon., May 2	Conflict and Cooperation	
39	Wed., May 4	Coevolution	
40	Fri., May 6	Human Evolution	
41	Mon., May 9	Human Evolution	
42	Wed., May 11	Human Evolution; Class Wrap Up	
--	Thurs., May 12 & Fri., May 13	Faculty Consultation Days	
--	Mon., May 16; 1:15-3:15 PM	Final Exam	Exams are in-person