

BIEB 154: Evolutionary Inquiry

Lectures: TTh 12:30-1:50 PM, Warren Lecture Hall 2113

Discussion sections:

Fri 11 AM (A01): Center Hall 217A

Fri 9 AM (A02): Center Hall 217B

Professor contact information:

Dr. Sarah Stockwell (sarahs@ucsd.edu)

Pronouns: she/her

Office hours: Tuesdays 2:30-3:30 PM via Zoom. Zoom meeting ID 858 534 0174.

Graduate IA contact information:

Michaela Labare <mlabare@ucsd.edu>

Office hours: Thursdays 4:30-5:30 PM via Zoom. Zoom meeting ID 954 5217 4949.

The best way to contact us is via email. In all emails, please put “Evolutionary Inquiry” in the subject line. I will do my best to answer emails within two business days. The most certain way to get your questions answered is to ask in class or discussion section.

This syllabus is subject to change, particularly because of campus efforts to contain COVID-19. Any schedule changes will be posted on the Canvas site. Make sure to frequently check the Canvas site to keep updated.

Course description:

This is an in-person class. I have mechanisms in place to accommodate students who need to miss individual lectures/assignments for reasons such as temporary illness or required quarantine. However, those mechanisms are emergency measures; they are not intended as a way for you to take all or even a substantial part of the class remotely. If you are unable to attend this class in person most of the time, please drop it and look for classes that are being offered remotely this quarter instead (look for RCLAS in the classroom field in WebReg).

The midterm and final exam are in-person exams.

If you have special circumstances regarding your ability to attend most of the class in person, please email me as soon as possible to discuss your situation: sarahs@ucsd.edu. If you develop COVID-19 symptoms or test positive for COVID-19 during the quarter, please make your safety and the safety of others your top priority: use the remote alternatives and flexible policies to keep up with the classwork until it is safe for you to return to in-person class. If you have been exposed to COVID-19, please follow UCSD’s guidelines.

The course has the following goals:

- To give you a deep understanding of a selection of important questions in evolutionary biology.
- To improve your ability to write accurately and engagingly about science for a general audience. Such writing serves both to clarify your own thinking and to improve your ability to communicate science to others.
- To build your skill at taking in a large amount of information on a given scientific topic, presented from different perspectives, and synthesizing it into a coherent understanding of the topic.
- To improve your ability to read primary literature in the field.

We will spend 1-3 weeks on each of 6 important topics in the field of evolutionary biology. The topics will range across much of modern evolutionary biology, but this class is not intended as a survey. Instead, we will take the time to delve deeply into a small number of topics through reading, writing, and discussion.

This course is different in format from other science classes you have probably taken. There is no textbook and there will be limited lecturing. Instead, we will read and discuss two kinds of literature. For each of the topics, we will read ~100 pages on the topic from books and articles written for a general audience about evolutionary biology to provide background and context. For several of the topics, we will then use this knowledge to help understand a scientific article, written for an audience of scientists, which you will be expected to discuss in detail. By the end of the class, you should have improved your skills at reading scientific literature and deepened your understanding of several major areas of inquiry in evolutionary biology.

There will be a midterm and final exam for the class, covering the content we have read about and discussed in class. See below for more information on the exams.

In addition, you will write a series of short papers (max. 2 pages) for a general audience where you respond to, summarize, or interpret what you have read on the topics. We will do activities in class to help you think critically about the process of writing clearly and engagingly about science, with the goal of improving your science writing over the course of the quarter.

The topics we will investigate this quarter are:

- 1) How powerful and consistent is natural selection?
- 2) How repeatable/predictable is evolution?
- 3) Where do new traits come from?
- 4) How does human evolutionary history affect us today?
- 5) How do humans affect the evolution of other species?
- 6) Race and racism in evolutionary biology

Required materials

- You will need a copy of The Beak of the Finch by Jonathan Weiner. All other readings will be posted as PDFs on the class Canvas site or otherwise made freely available to you.
- You will need an iClicker. A used one is fine. iClickers are available for purchase at the UCSD bookstore or online. You do not need to pay to register it anywhere. You do need to register it (for free) on the class Canvas site.
- Please bring some method of taking notes to class each day (paper/pen, laptop, etc.) You will need to take notes and we will also do in-class activities that require writing or drawing.

Canvas site for the course:

Check the Canvas site often for reading assignments to complete before classes and discussion sections, lecture slides to download after class, etc.

What to find on the Canvas site:

Reading assignments: By the end of each lecture day, I will post the reading assignment for the next lecture or discussion section on Canvas. You should complete this reading assignment and submit your reading journal entry by the start of the next class.

Materials for in-class activities, if needed.

Lecture slides: Research suggests that students learn best if they take independent notes, so I do not post lecture slides in advance. Lecture slides in PDF form will be available on within 24 hours after class.

Podcast: The class will be podcasted. Note that the podcast isn't a substitute for attending the class in person, especially for this course. Use the podcasts to catch up if you can't come to a class for reasons of illness/emergency, but don't rely on them. It has been my consistent observation that students who attend the class more often get higher grades in the class – not surprising, since we cover a lot of material via interactive discussions and activities during class.

I will post a schedule of class topics and major due dates on Canvas.

Grading:

- 40 points: Reading journal (5-7 surprise checks throughout the quarter; total points will be rescaled to a maximum of 40)
- 100 points: 2-page papers (20 points each)
- 32 points: Participation and preparedness. 27 points are for participating in clicker questions during lectures and attending discussion sections. 5 points are for following the participation/preparedness guidelines below. See below for more details.
- 20 points: In-class and other miscellaneous written assignments (estimate; may change somewhat during the quarter)
- 100 points: Midterm
- 100 points: Final exam (not cumulative)
- Total: 392 points

Your final letter grade will be based on your total number of points. If you get over 90% of the points you will receive an A, over 80% you will receive at least a B, etc. If needed to adjust the distribution of letter grades upward, grades will be based on a curve. The curve will only be used (if it is used) to move letter grade thresholds down, so it can only help your grade, not hurt it. For those taking the class pass/no pass (P/NP), the minimum final grade to receive a grade of P is a C-. The final course curve, *if there is one*, will be based on the students that are enrolled in the course at the end of the quarter.

Reading journals:

Reflecting on what you have read is an important part of understanding it and integrating it into your knowledge of biology. To help you with this, you will be expected to maintain a reading journal throughout the quarter. I will give you more information on how to keep your reading journal and how to submit entries for each class day.

Class participation and preparedness (lecture classes and discussion sections):

This part of your grade will be based on the following criteria:

- Arriving to class on time and abiding by UCSD's Principles of Community;
- Coming to class prepared, having read the assignments and thought about them;
- Actively engaging in class discussions and lectures: asking thoughtful questions, giving thoughtful answers and comments;
- Contributing answers/comments in which it is clear you have done the reading;
- Participating fully in class activities (e.g., small-group work) and doing in-class assignments.

Clicker participation/section attendance is worth 1 point per lecture or section and starts counting in week 2, for a total of 27 points. Clicker points will be based on participation, not on correctness.

Remote alternative for participation points: I realize that under the present circumstances, there may be particular classes that you cannot attend in person because of quarantine, illness, or other emergency. You can make up the participation/preparedness point for a particular class by choosing one of the day's reading selections and writing a half-page, double-spaced response to the question: "How does this reading help answer the big question we're investigating for the current topic?" For example, in the second week of class, we will be studying "How powerful and consistent is natural selection?" so you would discuss how the day's reading selection helps answer that question. Remote alternative participation assignments are graded on thoughtful effort and are due by the start of the next class. If illness/emergency prevents you from doing the remote alternative assignment and you would like to discuss an extension, please email me.

If you miss a class, be sure to also watch the podcast for that class.

Some class sessions have in-class activities that are worth points. If you don't attend that day's class, it is your responsibility to read the day's Canvas page and do the activity on your own if you wish to receive the points. If you need more information on how to do it remotely, please email me. The activities work much better live, because most of them are designed for groups to collaborate on.

Clickers:

This class will introduce you to new material and concepts. To increase the depth of your understanding and to give you practice in applying these concepts, I will provide opportunities for you to reflect on and discuss the ideas in class via clicker questions.

You will need to register your iClicker via the "iClicker Registration" link on the Canvas site. Bring your clicker to each class. You cannot share a clicker with another student enrolled in this class. Answering a clicker question for another student is an academic integrity violation.

It is your responsibility to have your clicker with you at lecture and to make sure it is working properly. If you had technical problems or forgot your clicker and you didn't get clicker points for a particular class, you can do the remote alternative participation assignment to make up the point (due by the start of the next class).

If you lose your clicker mid-quarter and use a different clicker, you need to change your registration in Canvas and you need to email me with this information before the next lecture: your student ID number and your new clicker ID.

In order to give you time to get your clicker registered and iron out any technical problems, clicker points will not start counting toward your grade until the second week of class.

Exams:

The exams are the primary method of assessing how well you have learned the scientific ideas and evidence presented in the readings and in class. In many biology courses, the exams are based primarily on the lectures. **In this class, the exams are primarily based on the readings.** We will mostly use class time to discuss and explore the readings, with occasional intervals of lecture to explain particularly challenging concepts or tie together ideas from multiple readings. The lecture material will be covered on the exams, but to do well on the exams you will need to understand the readings well.

The exams will not test scientific writing per se; that is assessed via the writing assignments. Instead, they will focus on the scientific content we have read about and/or discussed in the class. **I encourage you to take notes during class discussions.**

The exams will be held in person. The midterm will be during class on April 28 and the final will be 11:30 AM – 2:30 PM on June 6. If you are unable to take exams in person at the scheduled times due to unavoidable circumstances, please email me as soon as possible and we will discuss your options. During the quarter, if you become unable to take an exam at the scheduled time due to serious illness or other emergency, please email me as soon as possible and we will discuss your options.

The exams will be closed-book except that you can refer to paper copies of the *scientific articles* that have been assigned as readings. This does not include most of the readings, which are written for a general audience and which you will be expected to be able to discuss from memory. Do not share information about the exam outside the class.

All regrade requests should be submitted to me in writing (email is fine) within one week of your receiving the graded exam.

Late policy:

Assignments will be marked down 10% for each day (or part of a day) that they are late. There is no way to make up a missed reading journal check after the fact.

Prior biology knowledge

Since the prerequisites for the class are BILD 1 and BILD 3, I will assume that you are familiar with the material from those courses. For example, I will assume that you know the essentials of how gene expression is regulated, the rough outlines of evolutionary history of life on earth, and how to interpret a phylogenetic tree. **If you haven't thought about those things since you took biology in high school, you will need to do some extra work for this class.** If you find that there are concepts or terms in the reading or lecture that you don't know the background for, do the background reading on your own to bring yourself up to speed. We are also happy to help you in office hours.

Writing and Critical Expression Hub

We will be doing a lot of writing in this class. I strongly recommend the Writing Hub as a free and convenient resource to help you improve your writing. Information about the Writing Hub:

The Writing Hub -- Need help with a writing project? Want to talk through your ideas or get a second opinion on whether your writing is clear, logical, and well-supported? **The Writing + Critical Expression Hub (“Writing Hub”) can help!**

The Writing Hub offers UC San Diego students free one-on-one help with any writing project—from cover letters to lab reports, research papers to grant proposals. Visit the Writing Hub to meet with a supportive, well-trained peer writing mentor who will help you gain perspective on what works and what can be improved in your writing.

The Writing + Critical Expression Hub | writinghub.ucsd.edu | writinghub@ucsd.edu

What? Free help for all UCSD writers—any writing project, every stage of the process

How? Book appointments at <https://ucsd.mywconline.com>. Same-day appointments also available.

You don't have to bring a finished draft; for example, you can bring your notes and ideas and get help with organizing your paper. To encourage you to go, **I will offer 3 extra credit points** to each

student who goes to an appointment with one of the peer writing mentors to work on writing for this class **by the due date for the first 2-page paper.**

Students with special circumstances

UC San Diego (as an institution) and I (as a human and as the instructor of this course) are committed to full inclusion in education for all persons. Services and reasonable accommodations are available to students with temporary and permanent disabilities, to students with DACA or undocumented status, to students facing mental health issues or other personal situations, and to students with other kinds of learning needs. Please feel free to let me know if there are circumstances affecting your ability to participate in class. Some resources that might be of use include:

- Office for Student with Disability, <https://students.ucsd.edu/well-being/disability-services/index.html>
- UC San Diego CAPS (Counseling & Psychological Services), <https://wellness.ucsd.edu/CAPS/Pages/default.aspx>
- UC San Diego Undocumented Student Services, <https://uss.ucsd.edu/> Note: a list of campus resources can be found here: <https://students.ucsd.edu/sponsor/undoc/resources/index.html>
- Learning Strategies Center, <https://commons.ucsd.edu/academic-support/learning-strategies/index.html>
- The UCSD Basic Needs HUB is part of a UCSD network to address basic needs insecurity, including housing and food. It contains the Triton food pantry and other organizations. Students can obtain personal care products from the HUB for free, including shampoo, menstrual products, toothpaste, and even diapers for students with young dependents. 39% of UCSD students reported having trouble obtaining food: you are not alone, so I encourage you to take advantage of the support that's available. <https://basicneeds.ucsd.edu/>

I would be glad to help you identify other resources if needed.

Students requesting accommodations and services due to a disability for this course need to provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD), prior to eligibility for requests. Receipt of AFAs in advance is necessary for appropriate planning for the provision of reasonable accommodations. OSD Academic Liaisons also need to receive current AFAs. For more information, contact the OSD at (858) 534.4382 (V); (858) 534-9709 (TTY); osd@ucsd.edu, or <http://osd.ucsd.edu>. **You will need to coordinate scheduling of exams with me. All of these arrangements should be made within the first two weeks of the quarter.**

The Academic Achievement Hub (<https://aah.ucsd.edu/>) has many resources to help you succeed, including Learning Strategies tutoring: <https://aah.ucsd.edu/learning-strategies/index.html>

For transfer students: The Triton Transfer Hub offers services to transfer students including study spaces, peer coaches, learning strategists, free printing, and community building opportunities. <https://transferstudents.ucsd.edu/transfer-hub/index.html>

If you are having academic difficulty, OASIS (<http://oasis.ucsd.edu/>) can often help. They provide tutoring, as well as classes in study skills and time management.

This is a stressful time. If you are having personal difficulties, do not hesitate to seek help at Counseling and Psychological Services (CAPS):

(<https://wellness.ucsd.edu/CAPS/Pages/default.aspx>), which is free to students. They can help you get over many types of hurdles.

Problems? If you have serious medical or personal problems during the quarter, the university allows medical withdrawals. Contact the Biology Student Affairs Advising Services office at 858-534-0557 or go to their website.

Educational research and Evolutionary Inquiry

I and my colleagues do research on how students learn biology. One way that we measure whether a particular approach was effective is to look at your work in this class. However, it is your choice whether you consent to my using your work in our research. If you do participate in the research study, that would mean that your work in this class would be added to a set of data that we can analyze after the class ends. Your name and other personally identifiable information would be removed from the work before we analyze it. Your work would be anonymous for the data analysis. Also, we do the data analysis after the class ends and all grades have been turned in. As a result, none of this analysis could affect your grade in any way.

Please read the consent form for this research, which is appended to the end of the syllabus. It is also posted in the Course Information part of the class Canvas site.

If you consent to being part of this research, you don't need to do anything.

If you do NOT consent to being part of this research, you can opt out of it. In that case, please follow the directions at the end of the consent form to opt out. There are no penalties for opting out of the study, and it will not affect your grade in any way. The opt-out information is sent to a third party who keeps it safe until after classes end and I've submitted the grades, and then they de-identify the data and remove anyone's work who has opted out.

If you have questions or concerns, please email me: sarahs@ucsd.edu.

University Policy on Integrity of Scholarship

Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating or any other forms of dishonesty will not be tolerated because they undermine learning and the University's ability to certify students' knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result in sanctions. Sanctions can include an F in this class and suspension or dismissal from the University. So, think carefully before you act by asking yourself: a) is what I'm about to do or submit for credit an honest, fair, respectful, responsible & trustworthy representation of my knowledge and abilities at this time and, b) would my instructor approve of my action? You are ultimately the only person responsible for your behavior. So, if you are unsure, don't ask a friend — ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at academicintegrity.ucsd.edu. (Source: Academic Integrity Office, 2018)

Students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity. Academic misconduct is broadly defined as any prohibited and dishonest means to receive course credit, a higher grade, or avoid a lower grade. Academic misconduct misrepresents your knowledge and abilities, which undermines the instructor's ability to determine how well you're doing in the course. Please do not risk your future by cheating.

Students suspected of academic integrity violations on exams will be invited to Zoom follow-up meetings where they will be asked to (in real time, on video) justify their answers. If the instructor isn't convinced during the meeting, or if the student refuses to participate, the violations will be reported to the Academic Integrity Office.

To uphold academic integrity, students shall:

—Complete and submit academic work that is their own and that is an honest and fair representation of their knowledge and abilities at the time of submission.

—Know and follow the standards of the class and the institution.

Thus, no student shall engage in an activity that undermines academic integrity or facilitates academic integrity violations by others. This includes, but is not limited to, the following behaviors:

- No student shall procure, provide, or accept any material that contains questions or answers to any examination or assignment unless the student's possession of the material has been authorized by the instructor.
- No student shall complete, in part or in total, any academic work (e.g., examination, assignment, paper) or obtain academic credit (e.g., attendance, participation) for another person.
- No student shall allow any academic work or academic credit to be completed or obtained, in part or in whole, for themselves by another person.
- No student shall plagiarize or copy the work of others and submit it as their own work.
- No student shall employ aids in undertaking course work or in completing any exam or assignment that are not authorized by the instructor.
- No student shall alter graded class assignments or examinations and then resubmit them for regrading without the instructor's permission.
- No student shall submit substantially the same material more than once without prior authorization from the instructor, such as a paper that was written and submitted in another class.

(Source: UCSD Policy on Integrity of Scholarship, <http://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2>).

If you do not understand these expectations and authorizations, please speak with the Instructor as soon as possible. Please read the official UCSD policy at <https://academicintegrity.ucsd.edu/process/policy.html>

Policy on posting or selling course materials

Please do NOT post my lectures or class materials on public websites like Course Hero. I work hard on my class materials and do not want the material being made public for anyone to see or download.

Enrollment questions: Administrative, advising, or registration questions should be submitted via the Virtual Advising Center (vac.ucsd.edu).

University of California, San Diego
Consent to Act as a Research Subject

Investigating the Impact of Pedagogical Choices on University Student Learning and Engagement

Who is conducting the study, why you have been asked to participate, how you were selected, and what is the approximate number of participants in the study?

Gabriele Wienhausen, Director of the Teaching and Learning Commons, together with her education research colleagues is conducting a research study to find out more about how pedagogical choices affect student learning and experience in the classroom. You have been asked to participate in this study because you are a student in a class that is being studied or used as a control. There will be approximately 500,000 participants in this study.

Why is this study being done?

The purpose of this study is to create knowledge that has the potential to improve the learning and educational experience of students at UC San Diego and beyond.

What will happen to you in this study and which procedures are standard of care and which are experimental?

If you agree to be in this study, the following will happen:

- Your data from this class including grades, homework and exam submissions, and survey responses will be included in the analysis to determine the effectiveness of the pedagogical techniques used in this course compared to other similar courses.

How much time will each study procedure take, what is your total time commitment, and how long will the study last?

Your participation involves only agreeing to let us use your data in our analysis. It will require no time on your part above the time you put into this course without agreeing to the study.

What risks are associated with this study?

Participation in this study may involve some added risks or discomforts. These include the following:

1. A potential for the loss of confidentiality. We will not share your personally identifying data with people outside our research team. Data will only be kept in anonymized form for research purposes. Course data will not be used for this research study until after final grades have been posted and will be rendered confidential by removing any identifiers before analysis. Your instructor will not know whether or not you are participating in this study until after final grades have been posted. Data from students who opt out of the study will be removed prior to data analysis. Research records will be kept confidential to the extent allowed by law. Research records may be reviewed by the UCSD Institutional Review Board.

Since this is an investigational study, there may be some unknown risks that are currently unforeseeable. You will be informed of any significant new findings.

What are the alternatives to participating in this study?

The alternatives to participation in this study are not to participate. If you choose to opt-out of participating in this research study, we will exclude your data from analysis. Whether you participate will have no impact on your experience or grade in the associated class as the professor will not know who is or is not participating in the study until after final grades are assigned.

What benefits can be reasonably expected?

There is no direct benefit to you for participating in the study. The investigator, however, may learn more about how to improve student learning, and society may benefit from this knowledge.

Can you choose to not participate or withdraw from the study without penalty or loss of benefits?

Participation in research is entirely voluntary. You may refuse to participate or withdraw or refuse to answer specific questions in an interview or on a questionnaire at any time without penalty or loss of benefits to which you are entitled. If you decide that you no longer wish to continue in this study before the end of the quarter, simply respond to the online opt-out form here: <https://goo.gl/forms/JSBRjEmkES6W6xYc2>. If you decide to opt out after the quarter has ended, you must contact Laurel Nelson (laureln@ucsd.edu) and give the quarter and the course from which you would like your data withdrawn.

You will be told if any important new information is found during the course of this study that may affect your wanting to continue.

Can you be withdrawn from the study without your consent?

The PI may remove you from the study without your consent if the PI feels it is in your best interest or the best interest of the study. You may also be withdrawn from the study if you do not follow the instructions given you by the study personnel.

Will you be compensated for participating in this study?

You will not be compensated for participating in this study.

Are there any costs associated with participating in this study?

There will be no cost to you for participating in this study.

Who can you call if you have questions?

Gabriele Wienhausen and/or her colleague has explained this study to you and answered your questions. If you have other questions or research-related problems, you may reach Gabriele Wienhausen at gwienhausen@ucsd.edu or (858) 534-3958.

You may call the Human Research Protections Program Office at 858-246-HRPP (858-246-4777) to inquire about your rights as a research subject or to report research-related problems.

Your Consent

If you consent to participate in this study, no action is needed. If you DO NOT consent to participate in this study, or you choose to opt-out at any time during the quarter, please submit this form online at https://docs.google.com/forms/d/e/1FAIpQLScs0Czynypp4SxQJOsFMgP9nFDjJ0zzYPISBWsiP3_wiWkdjaA/viewform. Your instructor will not have access to the list of students who opted out until after grades are posted. Note that you must separately opt-out of the study for each course involved in this study.

[] I am not 18 years or older or I do not consent to anonymized research use of my data from the course specified below.

Course name: _____

Course section number: _____

Term: _____

Name: _____

PID: _____