

EBIO 4460: Ecology and Evolution in the Galápagos Islands

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Lec 5:30 – 7:30, RAMY N240

Lecturer: Derek Sweeny, derek.sweeny@colorado.edu.

Office Hours: By appointment (C287 RAMY)

Email: I consider email exchange in the context of this class to be a professional correspondence and it should be conducted in that manner. Writing formal emails is a great professional skill for all of you to practice. I will be available by email during normal 'business hours' (8am-6pm Monday-Friday).

Overview: This is a field-based, experiential course among selected islands of the Galápagos Archipelago. The course is designed to introduce students to:

- 1) ecology and evolution on islands;
- 2) the value of field observations and keeping a notebook as a record of your observations and thoughts;
- 3) the value of islands for understanding human influences on populations of plants and animals; and
- 4) the use of photography and illustration for making observations of the characteristics, distribution, and abundance of animals and plants

Course objectives and learning goals:

- 1) *Engage in observation-discovery and hypothesis-driven studies of ecology, evolution, and conservation biology.*
 - Develop different problem-solving strategies and use ecological and evolutionary principles to understand ecology, evolution, and conservation on islands.
 - Make personal discoveries about the world

- 2) *Effectively communicate scientific content, methods, and thinking*

- Construct logical-deductive arguments based on evidence
- Develop oral, written and visual science communication skills. Every job in science requires effective communication. Several class assignments will focus on communicating knowledge about population genetics through multiple venues.
- Communicate the applications of population genetics biology
- Effectively argue the relevance of population genetics to diverse audiences
- Demonstrate awareness of the ways context, audience, and purpose drive content, presentation, and stylistic choices

3) *Decipher, assess the validity, and gauge the uncertainty of scientific claims*

- Distinguish between claims based on scientific evidence and other types of claims
- Judge and critique the reliability, sufficiency, and/or authenticity of information
- Correctly interpret graphical, tabular, and text-based description of data
- Enhance ability to synthesize and critically evaluate information. Science is not about simply regurgitating information. We will engage in focused readings and discussions that will require critical thinking.

4) *Collaborate with people of varying knowledge and points of view towards common goals*

- Effectively collaborate with others towards shared goals
- Make and solidify interpersonal connections that stem from preparedness and participation in the sociology of science

5) *Use principals of evolution to explain the diversify of life*

- Explain how evolution happens (heritable variation, struggle for existence, natural selection, drift)
- Evaluate the human impact on the ecology and evolution of humans and other species

6) *Use your knowledge of ecology and evolution to explain patterns across multiple temporal and spatial scales, particularly on islands.*

- Model or illustrate how life history traits, competition, predation, parasitism and niche effects can influence ecology and evolution

Instructional format: This Global Seminar consists of two distinct but integrated parts: the pre-trip, and the expedition. The main emphasis of the pre-trip part of the course will be foundational learning about the ecology, evolution, and the effects of human presence in the Galápagos as well as the history of the archipelago. The pre-trip phase will consist of 6 two-hour classes (see above).

Suggested text: Weiner, Jonathan. 1995. The Beak of the Finch: A Story of Evolution in Our Time. Vintage Press. ISBN: 978-0679733379. **This book is writing for the general public and we strongly urge you to read it before or during the trip.**

Pre-trip expectations: We will engage in learning activities about the Galápagos prior to the trip. **It is expected that you will attend all pre-trip sessions and complete all assignments to the best of your ability.** Typically, the pre-class activities will focus on a particular topic and you will be asked to work on assignments designed to achieve specific learning goals.

When in the Galapagos: You will develop a notebook that is your record of observations, information, and thoughts during the trip. In addition, there will be a series of assignments. These will take different forms. One example: I will ask you to merge your observations about the natural world with a quote from the Origin of Species. On a typical day, we will be active during the entire day, from early morning to the end of the day. After dinner, we will meet and engage in some planned learning activities. This typically lasts for an hour (or so). After that, you are on your own.

Grading: Grades will be based on individual and group products generated during the course. Students will generate a field notebook while in the Galapagos that contains their responses to all assignments and projects. This will be due prior to leaving the Galapagos. In general, final course grades will be calculated on the familiar scale where $\geq 90\%$ = A; $\geq 80\%$ = B, $\geq 70\%$ = C, etc.

Participation and Class Discussions: Throughout the semester (and then in Ecuador), we will be having numerous discussions. You will receive credit for attending class and participating in these activities. Active discussion is an essential component of this course. It is imperative that all students do the assigned reading and actively comment and ask questions during any discussion period.

Pre-trip presentation: This will be an individual project wherein you select a topic of interest from the list provided (or come up with your own in consultation with me) and give a 10min presentation to the class on that topic. This will serve as a way for you to help your classmates become familiar with Galápagos flora, fauna, ecology, and conservation and will help prepare everyone for our expedition in January. I will provide a list of topics on the first day that we meet.

Expedition Field notebook: This will be an individual project and will make up the majority of your grade for the course. During our time in mainland Ecuador and

on the Galápagos Islands I will be asking you to reflect on your experience and record it in words, illustrations, and with pictures. There will also be daily themes/assignments, which you will respond to/complete in your field notebook. At the end of the trip I will collect all of your field notebooks and assign the main grade of the course based on their overall quality.

If you intend to include personal reflections in your filed books please keep in mind that I will be reading everything at the end of the trip. If you do want to journal in a more personal way during the trip, which can be very fun, I would suggest bringing an additional notebook.

I will provide write-in-the-rain and watercolor notebooks. If you want an additional notebook beyond those you will have to purchase it yourself. More details on the field notebook component of the course will be provided prior to the end of the semester.

Tentative schedule of pre-trip events:

Meeting	Topic	Activity
	Darwin and the Galapagos, Being in the field	Short discussion about Darwin and the Galapagos, starting a field notebook - how to look at nature, and a discussion about the Hickman and Stewart readings
	Geological setting Climate and the environmental setting	Lecture and activities designed to achieve specific learning goals
	How evolution happens: cases studies from the Galapagos	Lecture and activities designed to achieve specific learning goals
	Field notebooks, sketching, and watercolors	Lecture and activities designed to achieve specific learning goals
	Student topics	Student presentations

In Class Use of Electronic Devices: Electronics (cell phones, laptops, ipads...) can be powerful learning tools and I encourage students to use these devices appropriately to help them better learn the material in class (e.g. taking notes). However, research has shown that students who check their cell phones in class receive on average half a grade lower than their peers who don't. Surfing the Internet, or checking email on your laptop in class is even worse (almost a full grade lower on average). This behavior also distracts students around you and brings down their performance as well. You may be convinced that you are good

at multitasking, but science shows that you are not. Please use electronic devices appropriately in my classroom.

Accommodation for Disabilities: If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

Classroom Behavior: Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

Honor Code: All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu; 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).

Sexual Misconduct, Discrimination, Harassment, and/or Related

Retaliation: The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a

concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#). Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Religious Holidays: Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please make me aware of any upcoming observances as soon as possible. See the [campus policy regarding religious observances](#) for full details.