



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

COLLEGE OF ARTS & SCIENCES

STUDY ABROAD OFFICE

FedEx GLOBAL EDUCATION CENTER  
CAMPUS BOX 3130  
CHAPEL HILL, NC 27599-3130

T 919.962-7002  
F 919.962-2262  
studyabroad.unc.edu

January 15, 2018

Administrative Board of the College of Arts & Sciences

Dear Colleagues:

The Study Abroad Office submits for your approval a proposal for the establishment of a new program to be offered beginning **Summer 2019** and continuing annually.

Proposed Program: **UNC Ecology and Evolution in Ecuador**

Proposed Program Location: **Quito, Ecuador (University of San Francisco, Quito)**

Faculty Program Leaders: **Dr. Sabrina Burmeister & Dr. Keith W. Sockman, Biology Dept.**

## Program Information

This proposed faculty-led program would be offered for **5+ weeks (6 credits)** during the **Summer** Term.

**Program Rationale:** A course like Ecology and Evolution has so much potential to be taught in a country such as Ecuador. With the rich diversity of plant and animal life and the diverse ecosystems of a mountainous country, there will be many opportunities for us to directly compare what we learn in the classroom with our observations outside. Ecology and Evolution happen everywhere, but there are few places like a cloud forest to observe them so directly. The setting will simultaneously inform us and inspire us in our studies.

**Target Audience:** Biology is the largest major at UNC and this course is required for completion of the major. Many students take it over the summer. By offering it abroad, we can additionally provide them with a study abroad opportunity while they continue to make progress toward completing their degree.

**Anticipated Number of Students:** 10 – 15

**Student Levels Allowed:** Sophomore, Junior, or Senior

**Program Learning Objectives:** By the end of the course, students will be able to explain: 1) the origin of species in the context of natural selection; 2) how natural selection is one mechanism of evolution and contrast it with other methods of evolution; 3) how the interactions between organisms and their physical environments result in changes over evolutionary time (by natural selection), leading to the organismal diversity we see today; 4) how the interactions between organisms and their environment are related to tradeoffs, feedback, and networks at a variety of different scales. We will place a special emphasis on tropical ecology and reference evolution of tropical organisms.



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## Program Academics

**Proposed Course Name/Number:** Ecology & Evolution, BIOL 201

**Course Description:** With worldwide concerns like climate change, population growth, food and water security, and emerging diseases, it is particularly important for students to understand how one's decisions affect the ecosystems around us. In order to make informed decisions one needs a basic understanding of the principles of evolution and ecology. Evolution is the most fundamental concept in biology; it provides the basis for understanding the origin of all biological phenomena. Ecology can be viewed as the theater within which the evolutionary play takes place. Evolution cannot be understood in the absence of ecology and ecology cannot be understood without evolution. Both are essential for a complete understanding of virtually all facets of biology, including how the incredible diversity of life around us originated and is maintained.

**Description of Academic Instruction:** Classroom (both lecture and active learning) and field based observations. We will integrate recitation exercises into our regular class periods. Recitations for this course are in-depth and often hands-on group activities that are designed to supplement the lecture material. When the course is taught on campus, enrollments are enormous and separate recitation periods are required to give small group activity time to students with personal attention from TAs. In a small summer course, those types of activities are readily integrated into the regularly scheduled class time. In addition, they will receive personal attention from faculty rather than TAs. We are in touch with faculty within Biology who have developed recitation material for 201 on campus and will be able to utilize many of the same activities in Quito.

**Adapting Course to Shortened Timeframe:** We have extensive experience adapting courses to the summer schedule, both regular summer sessions as well as Maymester, which is much shorter than our proposed schedule. We will readily be able to adapt the material to the study abroad setting for two reasons. The proposed itinerary has 32 hours of in-class lecture time. In addition, we will use time in transport to field locations to lecture on relevant material (e.g., ecologies of our destinations) in addition to time spent on site discussing the course material related to the excursion, adding at least four hours. A regular semester is typically 36.25 hours. Finally, small classes with compressed formats are MUCH more efficient for delivery of material. One does not need as many hours to cover the same material.

**Description of Excursions/Activities:** Weekend visit to the Cloud Forest, guest lectures with USFQ Biology adjunct faculty member, visit to Otovalo. Possible visit to Tiputini Field Station in the Amazon.

**Course Prerequisites:** NONE

**Degree Requirements?** This proposed course is a Major-required course

**Language Prerequisites:** NONE

A proposed syllabus is included as an addendum to this proposal.



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## Program Location(s)

**Proposed Location(s):** Quito, Ecuador at University of San Francisco, Quito (USFQ), a UNC strategic partner.

**Location Rationale:** Quito offers a number of opportunities. First, UNC and the Department of Biology have an official association with faculty at USFQ. Incorporating the study abroad as an element will further strengthen that relationship and is also likely to make it easier to implement the logistics of the program. Second, the ecology and ecosystems of the region surrounding Quito are a huge asset in a course on Ecology and Evolution. Specifically, Quito is situated near one of the unique tropical ecosystems of the world, the cloud forest. Moreover, because of the surrounding topography, low-elevation tropical forests are immediately accessible. We will be able to make direct connections between our course material and the natural world outside, the tropical ecosystem where biodiversity is unparalleled by any other location in the world. Field excursions would enable us to explore different ecosystems (cloud forest, lowland tropical forest, arid Galapagos Islands), all within easy or moderate reach of Quito. Finally, there is a potential for developing longer-term research collaboration between UNC and USFQ stemming from this course that could provide opportunity for further development of field courses, for example. Second, this program will expand study abroad opportunities for biology majors at UNC. There are relatively few science courses offered as part of the study abroad program, and the study abroad programs have historically been underrepresented by science majors. Offering this course required by all biology majors at UNC will further extend to biology majors the learning and experiential opportunities historically accessed by non-science majors. Quito itself will offer an abundance of cultural experiences. The historic center of Quito has one of the largest and best preserved historic centers in the Americas. Quito was one of the first World Cultural Heritage Sites declared by UNESCO.

We have proposed to teach in Quito rather than at the Galapagos Science Center because of the extraordinary cultural opportunities that Quito represents. The historic center of Quito is a UNESCO world cultural heritage site because it is one of the best preserved historic centers in the Americas. The confluence of indigenous cultures with the history of Spanish colonialism in Quito is remarkable. The Galapagos Islands, while an incredible destination for the biologist, is culturally depauperate by comparison. Thus, it would not offer students the potential for immersion in a foreign culture. (Field stations are not cultural experiences.)

**Connections at the Proposed Location:** University San Francisco, Quito (USFQ), which will coordinate program logistics, housing (host families), excursions, and transportation for the program.

## Health & Safety Information

**Health Insurance:** The Study Abroad Office coordinates with the Office of Risk Management Services to enroll student and faculty participants in international accident and health insurance through GeoBlue for the duration of the program.

**Safety & Risk Information:** Crime (such as pick-pocketing) is widespread in parts of Ecuador. The State Department recommends exercising normal precautions in Ecuador but to avoid the northern border with Colombia due to crime (not relevant to our proposed program).



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Study Abroad Office staff will continue to monitor events in the host country and the U.S. State Department Travel Advisories in accordance with the *UNC Policy Concerning Global Study, Travel, and Research*.

**Health Information:** Food-borne illnesses are the primary health risks for traveling to Quito, Ecuador.

**Required Vaccinations (if applicable):** The CDC recommends that most travelers to Ecuador get the Hepatitis A and Typhoid vaccines because both can be contracted through food or water in Ecuador. Yellow fever vaccine is NOT recommended for Quito. Malaria transmission is NOT known to occur in Quito. Rabies is NOT a major risk in Ecuador. Because Quito is above 6,500 feet in elevation, there is low likelihood of Zika transmission (and other mosquito-borne illnesses)

Health, safety, and security information will be presented to students during the required pre-departure orientation.

## Faculty Program Leader Information

**Faculty Program Leader Bio:** Dr. Sabrina Burmeister is an Associate Professor in the Department of Biology at the University of North Carolina at Chapel Hill. She completed her PhD in Neuroscience in 2001 at University of Texas at Austin and conducted post-doctoral work at Stanford University. Her research interests span evolution, behavior, and neurobiology. Dr. Burmeister joined the Biology Department in 2005 and served as Associate Chair for Diversity from 2014-2016. She currently serves as Director of Faculty Diversity Initiatives in the College of Arts & Science. In 2017 she became a Scientific Teaching Fellow.

Dr. Keith W. Sockman is an Associate Professor in the Department of Biology at the University of North Carolina at Chapel Hill. He completed his PhD in Zoology in 2000 at Washington State University and conducted post-doctoral work at The Johns Hopkins University. Throughout his career, he has maintained an interest in the interface between ecology, behavior, and physiology and has used birds as a study system for his research.

**Experience in Proposed Location(s):** Dr. Burmeister has extensive experience traveling in Latin America, including Mexico, Panama, Costa Rica, Guyana, and Brazil. Most of these trips were research related (lasting 3-6 weeks) so Dr. Burmeister is adept at dealing with the unexpected in a foreign country. Her Spanish language skills are minimal, but adequate for basic traveling.

**Experience Leading Student Groups:** Dr. Sockman has extensive experience guiding small (3-6) groups of undergraduates conducting research in remote locations. This requires creating a sense of shared responsibility, delegating responsibilities (sometimes teaching undergraduates to cook for themselves), and occasionally dealing with the difficulties associated with living and working in close quarters with others. A study abroad program would be less intense, but nonetheless requires many of the same skill.



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## Conclusion

A letter of support from the home academic department is included in as an addendum to this proposal.

We are happy to provide any additional information necessary for your review of this program. Thank you for your time and your support of global opportunities for Carolina students.

Sincerely,

A handwritten signature in black ink that reads "Jason Kinnear".

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Jason A. Kinnear  
Assistant Dean of Study Abroad



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DEPARTMENT OF BIOLOGY  
COKER HALL  
CAMPUS BOX 3280  
CHAPEL HILL, NC 27599-3280

T 919.962.2077  
F 919.962.1625  
biology.unc.edu

March 1, 2018

Study Abroad Office  
The University of North Carolina at Chapel Hill

Dear Study Abroad Office,

I am writing in strong support of the application from Drs. Sabrina Burmeister and Keith Sockman to co-teach BIOL 201 (Ecology and Evolution) as part of a summer abroad program at University of San Francisco, Quito, Ecuador during the 2019 summer. This is an excellent proposal from two excellent faculty for the following reasons.

First, the Department of Biology at UNC has recently established a formal collaborative arrangement with the University of San Francisco, Quito, and we are now trying to consolidate that arrangement not only through research collaborations between our faculty and theirs but also through teaching arrangements precisely of the type proposed herein.

Second, UNC Chapel Hill has a long, rich history in its study abroad program, but it is primarily taken advantage of by non-science majors. Historically, science majors have viewed study abroad as an opportunity for primarily students majoring in the humanities and other areas, where immersion in foreign cultures facilitates learning and scholarship in areas such as literature, art, music, history, and government and politics. But modern science, biology in particular, can often be conducted anywhere and thus science majors have historically missed out on the wonderful opportunities afforded non-science majors. With recent support and encouragement from our UNC Studies Abroad Office, more science departments and students are now trying to facilitate study abroad opportunities for science majors, since they, like anybody, can benefit from cross-cultural immersion and travel to foreign countries. Perhaps nowhere is this more true for a biology major than for travel to the tropics, where first-hand experience with the unique tropical ecosystems of Central and South America exquisitely complements the study of ecology and evolutionary biology, the course subjects of Drs. Burmeister and Sockman's proposal. All within easy to moderate reach of Quito are extraordinarily biodiverse ecosystems, from lowland tropical rainforests, to high-elevation cloud forests, to the arid volcanic islands of the Galapagos, a true crucible not only of evolutionary processes (i.e., the Galapagos tortoises and the Galapagos finches) but of evolutionary and ecology research, starting with that of Charles Darwin and his famous voyage of *The Beagle*.

Drs. Burmeister and Sockman's proposal will provide another reason for science majors to partake in a study abroad program, by offering a Biology majors course that will fulfill one of the major's requirements. With well over 2000 majors, Biology is by far the largest major on campus, and thus the establishment of this biology course abroad will likely have a big impact on the participation in study abroad by science majors as a whole. Moreover, BIOL 201 is a course that is in extremely high demand by our biology majors. Not only is it required of our majors, but the department's current resources are barely sufficient to meet the demand, forcing many students to put it off and thus compromise many aspects of their own coursework, sometimes having to skip other courses they

would have taken if they could more readily or more conveniently take BIOL 201. Thus, this course in Quito will enable students wishing to have this experience abroad to fulfill one of the most difficult requirements our majors face, and it will simultaneously relieve our regular on-campus 201 offerings of the stress they currently face. Due to the heavy demand for BIOL 201 by our majors, I am confident this course will attract a strong, sizeable contingent of students wishing to take it as part of this abroad program.

Third, as alluded to above, the pairing of an ecology and evolution course (BIOL 201) with a study abroad location in the tropics with ready access to diverse ecosystems will unleash a pedagogical synergy. Students studying ecology and evolution want to see first-hand the impacts of ecological interactions and evolutionary phenomena. It is difficult to imagine a more appropriate location to do so.

Fourth, both Dr. Burmeister and Dr. Sockman are ideally qualified for this proposal. They are both veteran UNC professors in the Evolutionary, Ecological, and Organismal side of the Biology Department, and each has a long history of teaching UNC undergraduates in related fields. Dr. Burmeister has taught Evolution of the Brain on several occasions, and Dr. Sockman regularly teaches Evolution of Vertebrates one to two times per year for the past 13 years and has also taught multiple ecology seminars. Dr. Burmeister's research focuses on tropical frogs and their adaptations to their environments. On several occasions, she has taken trips to Panama, Costa Rica, Brazil, and Guyana as part of her research, often on specimen-collecting missions in the tropical rainforest. Dr. Sockman has conducted a long-term (over 10 years) field research program on ecological adaptations in birds that has consistently made use of numerous UNC undergraduates as field research help. Thus, he is well versed in hands-on ecological field research experiences with UNC undergraduates in remote locations. Finally, their UNC undergraduate teaching evaluations are consistently excellent, as UNC undergraduates view their teaching approaches and abilities in high regard.

In short, I strongly recommend this proposal by Drs. Burmeister and Sockman to co-teach a course of BIOL 201 at the University of San Francisco in Quito, Ecuador in the summer of 2019. Please let me know if I can provide any further information.

Sincerely Yours,

A handwritten signature in black ink, appearing to read "Victoria Bautch". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

Victoria L. Bautch, Ph.D.  
Beverly Long Chapin Distinguished Professor and Chair of Biology

## Course Syllabus

Biology 201 - Ecology and Evolution, Study Abroad (Quito Ecuador) Summer 2019

### Instructors:

Dr. Sabrina Burmeister, sburmeister@unc.edu

Dr. Keith Sockman, kws@unc.edu

**Welcome to BIOL 201 - Ecology and Evolution!** With worldwide concerns like global warming, population growth, food and water security, and emerging diseases, it is particularly important for you to understand how your decisions affect the ecosystems around you. In order to make informed decisions you will need a basic understanding of the principles of evolution and ecology. Evolution is the most fundamental concept in biology; it provides the basis for understanding the origin of *all* biological phenomena. Ecology can be viewed as the theater within which the evolutionary play takes place. Evolution cannot be understood in the absence of ecology and ecology cannot be understood without evolution. Both are essential for a complete understanding of virtually all facets of biology, including how the incredible diversity of life around us originated and is maintained.

By the end of this course you will be able to do the following:

1. Explain the origin of species in the context of natural selection;
2. Explain how natural selection is one mechanism of evolution, and contrast it with other mechanisms of evolution;
3. Explain how the interactions between organisms and their physical environments result in changes over evolutionary time (by natural selection), leading to the organismal diversity we see today.
4. Explain how the interactions between organisms and their environment are related to tradeoffs, feedback, and networks at a variety of different scales

**Prerequisites:** We assume that each of you has had the equivalent of a semester course in biology wherein you learned Mendelian genetics and enough basic biology to know the major groups of organisms and the terms used for describing them. We also assume a solid background in high school algebra.



**Course Website:** <http://sakai.unc.edu>

**Required Textbooks:**

1. SimUText Ecology electronic textbook. Available from the SimUText website:  
<https://www.simutext.com/student/register.html#/key/UgRm-fvMw-bSxL-Ju8y-AnG8>  
Available from UNC Student Stores. See instructions for how to register under Sakai Announcements.
2. Bergstrom C.T. and Dugatkin, L.A. 2016. *Evolution*, 2<sup>st</sup> Edition. WW Norton and Company (Editors). Available anywhere textbooks are sold (including UNC Student Stores).

**Reading:** Reading assignments will be listed on the lecture schedule, and will be drawn either from the course textbooks or they will be posted on the course Sakai site. Readings should be completed *prior* to the lecture for which the reading is assigned.

**Guided Reading Questions** are questions meant to assist you as you read the Bergstrom and Dugatkin textbook (these are not graded).

**Sakai Reading Quizzes** are based on the assigned activities or reading for the upcoming week. These quizzes are required and graded based on correct answers. See below for more information.

**READING ASSIGNMENTS/QUIZZES (10% of your grade):** Accompanying every reading assignment will be graded questions (i.e. a quiz) that test your comprehension of the reading. Quizzes corresponding to readings for the upcoming week must be completed prior to class. Reading quizzes can be found on our Sakai site. Mark your calendars and leave yourself enough time to complete these assignments! Please see the lecture schedule for more details. These quizzes will be graded for correct answers. The purpose of these activities is to help you practice using your knowledge and ensure that you come to class prepared to engage more actively with the material you have read. No late assignments or quizzes will be accepted.

**GROUPS**

Students learn more when they work in small groups of peers to discuss issues and solve problems. In every class meeting, you will sit with your group in a designated area. We encourage you to get to know your group members because you will work with them throughout the semester. Collaborating with others is an important skill in all professions, and we are available to help you to solve interpersonal problems that may arise within your group.

**EXAMS (90% of your grade):** There will be 4 exams worth 22.5% each, one for each quarter of the class. Exams 1-3 are not cumulative, except that the advanced material at the end of the course builds on the basic material taught in the beginning. Exam questions will be taken from lectures and assigned readings. **Use each lesson's learning objectives as a study guide!** Exams will consist of a variety of question types including: true-false, multiple choice, fill in the blanks, and short answer. Exam style questions will be given for practice during many lectures. Your final exam will be cumulative: 50% material from the last portion of the class, 50% material you were tested on previously.

**GRADE CALCULATION:** Your letter grade will be based on the sum of your performances on quizzes, in-class participation, exams, and recitation according to the following scale:

A: 93-100% A-: 90-92.9% B+: 86-89.9% B: 83-85.9% B-: 80-82.9%

C+: 76-79.9% C: 73-75.9% C-: 70-72.9% D: 65-69.9% F: <65%

**NOTE:** In order to achieve a fair grade distribution, at the end of the semester, the instructors may *adjust* grade thresholds class-wide to improve your letter grades; the thresholds will under no circumstances be

**UNC CHAPEL HILL**  
**Ecology & Evolution**

	DAY	DATE	ACTIVITY	TRANSFER	Contact Hours	LODGING	MEAL
1	MON	24-Jun	Arrive in Quito	Transfer airport - Hotel Cumbaya		Homestays	NA
2	TUE	25-Jun	AM Orientation & Welcome Lunch USFQ; PM City Tour	BUS		Homestays	B, L, D
	WED	26-Jun	Class at USFQ		3	Homestays	B, D
3	THU	27-Jun	Class at USFQ		3	Homestays	B, D
4	FRI	28-Jun	Class at USFQ		3	Homestays	B, D
5	SAT	29-Jun	Travel to Macquipucuna Activities in Macquipucuna	BUS	2	Macquipucuna	B, L, D
6	SUN	30-Jun	Return to Quito	BUS		Homestays	B, L, D
7	MON	1-Jul	Class at USFQ		3	Homestays	B, D
8	TUE	2-Jul	Class at USFQ		3	Homestays	B, D
9	WED	3-Jul	Class at USFQ		3	Homestays	B, D
10	THU	4-Jul	Class at USFQ		3	Homestays	B, D
11	FRI	5-Jul	Class at USFQ		3	Homestays	B, D
12	SAT	6-Jul	Cayambe Coca Hike + Papallacata	BUS	2	Homestays	B, L, D
13	SUN	7-Jul	Visit to Antisanilla	BUS	2	Homestays	B, L, D
14	MON	8-Jul	Class at USFQ		3	Homestays	B, D
15	TUE	9-Jul	Class at USFQ		3	Homestays	B, D
16	WED	10-Jul	Class at USFQ		3	Homestays	B, D
17	THU	11-Jul	Class at USFQ		3	Homestays	B, D
18	FRI	12-Jul	Class at USFQ		3	Homestays	B, D
19	SAT	13-Jul	Rest Day			Homestays	B, D
20	SUN	14-Jul	Rest Day			Homestays	B, D
21	MON	15-Jul	Class at USFQ		3	Homestays	B, D
22	TUE	16-Jul	Class at USFQ		3	Homestays	B, D
23	WED	17-Jul	Class at USFQ		3	Homestays	B, D
24	THU	18-Jul	Otavaló + Farewell Dinner Late night departure to Quito Airport		2	Homestays	B, L, D
25	FRI	19-Jul	Red-eye departure to US	Transfer to Airport		NA	NA

**Total Contact Hours: 56**