EBIO 3780: Tropical Field Biology & Conservation

Instructors

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Community Partners: Fundación Conservación de los Andes Tropicales (FCAT; https://fcat-ecuador.org)

Margarita Baquero
Executive Director

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Fernando Castillo
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Domingo Cabrera
Founding Member, Biologist & Conservation Activist

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Biologist & Conservation Activist

Course Overview: This is an intensive, immersive study abroad course with a strong focus on experiential learning and engaged scholarship. The course will be primarily based in Ecuador, with expectations for additional work before and after the international experience. The course serves as a 3000-level elective in the Department of Ecology and Evolutionary Biology, and as an elective for Environmental Studies (EVST) minors. It includes a mandatory, zero-credit Service Learning component (to be fulfilled during the course), which will satisfy the second tier SL requirement for sophomores, juniors, and seniors. Students will receive 3 total credit hours for completing this course.

Course goals: The goal of this course is to increase students' understanding of contemporary issues in tropical biology and conservation. In addition, this course aims to broaden students' capacity to complete the scientific process with an emphasis on biological systems and conservation.

Course objectives: This course will: (1) expose students to foundational theories and methods central to tropical biology through lectures, readings, and workshops; (2) guide students in independent research projects; and (3) familiarize students with the complexity of socio-economic dynamics involved with conservation in the tropics.

Course outcomes: By the end of the course students should be able to: (1) explain the implication of foundational theories in tropical biology; (2) develop, implement, and present scientific studies using appropriate techniques; and (3) assess the factors that impact local conservation outcomes.

Course activities and schedule:

Pre-Ecuador (April 4 – August 3, 2019)

1. Development of research project ideas
2. Reading to provide baseline knowledge and refine project ideas
3. A short (1 – 2 pg.) proposal for research in Ecuador **– DUE May 30, 2019**

Ecuador (August 4 – August 19, 2019)

1. Classroom lectures
2. Research project: project design; data analysis and interpretation; presentation of results
4. Engaged scholarship: visits to community conservation projects, daily interaction with Ecuadorian biologist and conservation practitioners
5. Exam and two reflective essays

Post-Ecuador (August 19 – September 19, 2019)

1. 10 pg. (double-space) scientific report on independent research conducted in Ecuador, with 10-15 references **– DUE September 1, 2019**
2. One, three pg. reflective essay **– DUE September 1, 2019**

General course structure: *Tropical Field Biology and Conservation* gives students the opportunity to increase their understanding and appreciation of tropical biology, and to apply the theory and knowledge they have acquired in the classroom to the real world. Students will travel with Dr. Karubian, Dr. Ribeiro, and Zoe Diaz-Martin to Ecuador for a 16-day intensive field course. While on the course, students will receive regular lectures on tropical biology and conservation and will implement and write up field-based research projects related to the lecture material. Students will increase their knowledge base about tropical ecology and conservation and will experience the challenges and rewards of conducting field research and implementing conservation activities in tropical environments. These activities will take place within a context of community engagement based on active collaboration and interaction with Ecuadorian local residents in a variety of contexts.

Typical daily schedule:

7am – 8am:	Breakfast (1 hr)
8am - 12am:	Research project: data collection in the field (4 hr)
12pm - 1pm:	Lunch (1 hr)
2pm - 4pm:	Lecture or workshop (2 hr)
4pm – 6pm:	Research project: data collection or data analysis (4 hr)
6pm – 7pm:	Dinner (1 hr)
7pm – 8pm:	Informal lecture (1 hr)
8pm - 11pm:	Study / reading / work on reports (3 hr)

Lectures: Students will receive daily lectures. Day time class lectures are designed to provide a strong foundation of expertise in tropical ecology and conservation, which will be enhanced by experiential learning, and community engagement components of the class. Informal evening lectures will be provided by practitioners in the field of tropical ecology and conservation.

Workshops: Instructors will lead a series of workshops that provide students with practical knowledge of tropical forests and methods to study these systems. These

workshops are designed to be interactive and focus on experiential learning. They will be led by course instructors and FCAT biologists.

Research projects: Students will implement a hands-on research projects with close instructor guidance and supervision. Students will choose *one* of the following research project topics:

1. Caterpillar predation: This group will quantify rates of predation on clay molds of caterpillars in different experimental contexts. Students have the opportunity to experimentally investigate how life history factors, such as caterpillar color, density, size, and position, and environmental factors, such as habitat type and abundance of avian predators, may interact to shape evolution of mimicry and habitat use in the wild.
2. Terrestrial animal communities: Students will use motion-activated camera traps to valuate how different habitat variables impact the diversity and composition of terrestrial mammals and birds. There is also the opportunity to conduct research on seed dispersal and other ecological processes in the context of this project.
3. Avian communities: Students will deploy mist nets to capture birds and record data on each individual. The group will then use the data to explore a number of questions relating to factors influencing community diversity and composition, and also species morphological traits.
4. Social aspects of conservation: This group will take an ethnographic approach to understanding the social dynamics of conservation. Using a combination of long-form interviews with select conservationists in the region and potentially written surveys for a sub-set local families, students will study how residents think about conservation-oriented issues.

Prior to departure, instructors will meet with students twice to identify viable projects and guide project development. In this pre-departure component of the course, students will conduct literature review and prepare a short (1 – 2 pg) research proposal. In Ecuador, students will collect data in close collaboration with instructors and our in-country counterparts from FCAT. With instructor supervision, students will formulate hypotheses, collect data from the field, analyze data, and write up preliminary reports on their findings. Research findings will also be presented orally in an informal seminar on the final day of the Ecuador component of the course. After completion of the course, students will be expected to continue working on their reports, including additional analyses (if appropriate), more extensive literature review, improving writing quality. Instructors will interact with students via email during this phase, and students will electronically submit a final report after returning from Ecuador.

Community Engagement / Service Learning: The zero-credit Service Learning component of this course is obligatory, and will consist of directed ecology/conservation field research, exchange and interaction with local residents, and exposure to local conservation projects. Student research projects will be designed and implemented in close collaboration with FCAT personnel. These individuals are longtime members of the Ecuadorian non-governmental organization *Fundacion para la Conservacion de los Andes Tropicales*, with over 50 years of tropical ecology and conservation experience among them. They are the community partners on this course, and they will accompany the students in all phases of the course and collaborate on the research projects. In this sense, Tulane students will directly incorporate 'engaged scholarship' approaches into their scientific research in a fundamental way.

In addition to this intensive collaboration with our core community partners, students will visit a series of local communities and conservation and research projects. During these visits, students will interact with local residents and conservation practitioners to gain a first-hand sense of the conditions shaping the land use decisions in biodiversity hotspots. Students will write and turn in three reflection essays in which they document their interactions with local community members and discuss the ways in which this experience has shaped their perception of ecological research and conservation biology.

Co-requisite or Prerequisite: Consent of instructor. Ecology & Evolutionary Biology 2200 and Spanish are recommended, but not required.

Description of Assignments:

Research Proposal: Students are expected to submit a 1 – 2 page research proposal modeled after a NSF Graduate Research Fellowship proposal by **May 30th, 2019.** The proposal should contain 5 – 10 relevant references, and should clearly lay out hypotheses to be tested, methods, expected results and interpretation. Students will develop this proposal in conjunction with the instructors

Exam: One essay and short answer exam will be administered during the course to assess understanding of core concepts and information from classroom lectures. The exam will be given on Day 12 of the course.

Reflection Essays: Students write and submit three, three-page (double spaced) reflection essays about the role that community engagement plays in both conducting tropical ecological research and conservation. The goal is for students to reflect on personal observations about the biological and cultural diversity that you will experience throughout the trip. The essays should explore impactful aspects of the course and what students have gained through their experiences. The first essay should consider student's first impressions of the course and the experience. The second essay should focus on student's thoughts on the three different community conservation sites the course visits. The third and final reflection should focus on final reflections about the course and experiences and is due September 1, 2019 (same day as final report).

Research Report: Students will work with instructors and community partners to design and implement a research project, resulting in a single report at the conclusion of the course. Students are expected to present a thorough introduction with appropriate references; coherent hypotheses; detailed methods; results; and discussion. Instructors will meet on a daily basis with students during the course to assist with project and report development, including statistical analyses. Students will have basic statistical results and a working draft of the final report in hand by the completion of the Ecuador component of the course. Upon returning home, students will have one month to complete the final report. During this time, they are expected to refine the writing style, complete literature review and any outstanding analyses, and format the report properly. The final report should be approximately 10 double spaced pages of text, not including figures or references. The report should include 10 – 15 references. Specific guidelines for the written and oral presentations are provided below.

Oral Presentation: As a group, students will prepare 10 to 15-minute presentations summarizing their research, to be presented in a mini-symposium on the final day of the

Ecuador component of the course. Each student is responsible for contributing to the presentation and will present a portion of their group's presentation (2-5 minutes). Presentations will follow the same general outline as the research reports (above) and will be made in Powerpoint or Prezzi. Students will work with instructors to ensure background information, hypotheses, methods, results and discussion are all adequately included in the presentations.

Grading:

Research Proposal	**10%**
Exam	**20%**
Reflection Essays (5% each)	**15%**
Research report	**40%**
Oral presentation	**15%**

A+ = 98-100 B+ = 88-89.9 C+ = 78-79.9 D+ = 68-69.9 F = <60
A = 92-97.9 B = 82-87.9 C = 72-77.9 D = 62-67.9
A - = 90-91.9 B - = 80-81.9 C - = 70-71.9 D - = 60-61.9

Promoting Respect for Others in This Class:

"Tulane University recognizes the inherent dignity of all individuals and promotes respect for all people. As 'One Wave,' Tulane is committed to providing an environment free of all forms of discrimination outlined in our University Equal Opportunity/Anti-Discrimination Policies, which includes all forms of sexual and gender-based discrimination and harassment, including sexual assault, intimate partner violence, and stalking. If you (or someone you know) has experienced or is experiencing these types of behaviors, know that you are not alone. Resources and support are available. Learn more at [titleix.tulane.edu] titleix.tulane.edu and onewave.tulane.edu. Any and all of your communications on these matters will be treated as either "Confidential" or "Private" as explained in the updated chart below."

Confidential	Private
Except in extreme circumstances, involving imminent danger to one's self or others, nothing will be shared without your explicit permission.	*Conversations are kept as confidential as possible, but information is shared with key staff members so the University can offer resources and accommodations and take action if necessary for safety reasons.*
Counseling & Psychological Services (CAPS) | (504) 314-2277 or The Line (24/7) | (504) 264-6074	Case Management & Victim Support Services | (504) 314-2160 or srss@tulane.edu
Student Health Center | (504) 865-5255	Tulane University Police (TUPD) | Uptown - (504) 865-5911. Downtown - (504) 988-5531
Sexual Aggression Peer Hotline and Education (SAPHE) | (504) 654-9543	Title IX Coordinator | (504) 865-5615 or titleix@tulane.edu

Detailed Course Itinerary

August 4th: Arrive in Quito, Ecuador

All students must be in Quito, Ecuador by the evening of August 4th. Lodging is TBA.

August 5th: Travel to FCAT Reserve

From Quito, we will travel as a group to the FCAT Reserve, stopping along the way to experience other ecosystems and attractions. We will arrive to the Reserve in the late afternoon/early evening.

August 6th – 10th: Course activities at FCAT Reserve (5 days)

The FCAT Reserve is a privately-owned reserve in northwestern Ecuador. The 165.4 ha property contains a mixture of pasture, secondary, and old growth forest. It provides a suitable venue for students to directly investigate how different types of anthropogenic land use impact patterns of diversity and ecological processes. In addition, its proximity to other community run conservation projects provides students the opportunity to investigate the socio-economic aspects of conservation in the region. Facilities at the station include running water, hot showers, shared dormitory style rooms, and prepared meals. During this time students will be given lectures and workshops and begin research projects.

August 11th – 13th: Field trips to community conservation projects (3 days)

The course will travel to three different community projects and spend the day and a night at each site. Our first stop will be Bilsa Biological Station, which is another private reserve run by the organization Jatun Satcha. Bilsa Biological Station, Bilsa is known for its wide variety of wildlife and is home to endemic species such as the long-wattled umbrella bird, the banded ground cuckoo, and the Ecuadorian capuchin. At Bilsa, we will divide into three groups and explore different parts of the reserve. Our second stop will be the Refugio del Gavilán (https://refugiodelgavilan.com/), which is a family run eco-tourism project that aims to develop a sustainable model of conservation by attracting volunteers. This property offers beautiful waterfalls and an opportunity for cultural exchange with the family and nearby school. The third site is the Laguna de Cube, a freshwater lake that was declared a RAMSAR site for its importance for water fowl. La Laguna offers eco-tourism cabins to house tourists who are visiting the lake. The cabins at the Laguna are run communally by the nearest hamlet, la Y de la Laguna (or just la Y). At the Laguna we will be learning about monitoring freshwater ecosystem and sampling micro invertebrates.

August 14th – 17th : Continue course activities at FCAT Reserve (4 days)

Back at the FCAT Reserve students will continue their research projects and will finalize their research presentations. Lectures and workshops will continue. The last day at the Reserve students will present their research projects and the day will end with a party that includes community members.

August 18th: Travel Day

We will travel from the FCAT Reserve to Quito. Back in Quito any presentations that were not given the day before will be presented then. Students will be flying back to the US on the evening of the 18th.

Course schedule:

Date	Location	AM	PM	Topic	Assignment due
4-Aug			Arrive to Quito		
5-Aug		Travel to FCAT Reserve	Get settled in at FCAT reserve		
6-Aug	FCAT Reserve	Orientation hike / Workshop	Research Project	Study Design and Field Methods (ZDM & TL)	
7-Aug	FCAT Reserve	Research Project	Lecture / Research Project	Human Dimensions of Conservation (JK)	
8-Aug	FCAT Reserve	Research Project	Lecture / Research Project	Biogeography of tropics (RDR)	
9-Aug	FCAT Reserve	Research Project	Lecture / Research Project	Tropical Forest Structure (ZDM)	
10-Aug	FCAT Reserve	Research Project	Lecture / Research Project	Biological Interactions (RDR)	Reflection 1
11-Aug	Community Conservation Field Trip	Bilsa Biological Station			
12-Aug	Community Conservation Field Trip	Refugio del Gavilán			
13-Aug	Community Conservation Field Trip	La Laguna de Cube			
14-Aug	FCAT Reserve	Research Project	Workshop / Research Project	Tropical Plant Identification and Ecology (ZDM & TL)	
15-Aug	FCAT Reserve	Research Project	Lecture / Research Project	Tropical bat biology (KN) + evening bat workshop	
16-Aug	FCAT Reserve	Research Project	Exam / Prepare presentations		Exam
17-Aug	FCAT Reserve	Presentations	Party		Reflection 2 / Presentation slides
18-Aug		Travel to Quito	Papallacta Depart for US		