Natural History and conservation of the Galápagos Islands and tropical Andes  
Spring 2019 PBIO 195/ENVS 150

Instructors:
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Course Description
Ecuador, the most biodiverse country in the world, harbors an incredible array of landscapes within a remarkably small area. This course will provide a hands-on exploration of the unique biodiversity found in the tropical Andes and the Galápagos Islands, while studying ideas of how this great diversity came to be, and learning about the current conservation efforts in place that aim to protect this diversity.

Course learning goals
This course is intended to be a unique immersion experience for students to develop a broad understanding of the natural history (geology, climate, biodiversity, biogeography) of the Galápagos Islands and the tropical Andes within the context of the following specific objectives:

1. Discover the rich biodiversity of the Andes by learning to identify different species and contemplate their adaptations to the environment.
2. Explore the biogeographic patterns of the flora and fauna in the Galápagos Islands through learning about historical geologic events, climate shifts, and the subsequent colonization of organisms in different ecosystems.
3. Examine Darwin’s ideas about natural selection, adaptation, and speciation through direct observation of the evolutionary phenomena witnessed in the Galápagos Islands.
4. Learn about current conservation efforts that will preserve the rich biodiversity and the country’s indigenous way of life.

Books
Required:

Recommended:

Performance Goals
1. Participation: students will be expected to engage in pre-departure meetings, daily activities, as well as nightly lectures and discussions.
2. Completion of assignments
   a. Assignment 1: Pre-departure readings, writing, and snip-it
   b. Student field notebook: Students will maintain a field notebook that demonstrates an understanding of field identification techniques with
daily-recorded observations. Notebooks will be evaluated and graded for completeness.

c. Final Project: at pre-departure meetings students will choose a topic that they will focus on throughout the course, developing an outline of a presentation (project proposal) to be completed before the last day of the trip. A 10-minute presentation, with an accompanying essay (less than 5 pages) will be handed in after the completion of the course at a post-trip meeting.

Grading
We will use the following tentative grading scheme:

<table>
<thead>
<tr>
<th>Assignment 1</th>
<th>10%</th>
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<tbody>
<tr>
<td>Field notebook</td>
<td>25%</td>
</tr>
<tr>
<td>Project Outline (proposal)</td>
<td>5%</td>
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<tr>
<td>Final Project Report</td>
<td>20%</td>
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<tr>
<td>Final Project Presentation</td>
<td>20%</td>
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<tr>
<td>Participation</td>
<td>20%</td>
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</tbody>
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Academic honesty: You are expected to maintain a high standard of academic honesty. Please read about UVM’s Academic Honesty Policy at http://www.uvm.edu/policies/student/acadintegrity.pdf

Be particularly careful to avoid plagiarism when working on written assignments.

Religious holidays: You have the right to practice the religion of your choice. Each semester, you should submit in writing to your instructors by the end of the second full week of classes your documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observances to make up this work.

Tentative schedule
Spring Break, March 9-March 17, 2019 (Itinerary subject to change)

Day 1: Arrive in Ecuador
Activities: travel day, orientation on arrival.

Day 2: Andes
Activities: visit Rancho del Cañon near Papallacta, explore cloud forest and páramo ecosystem, finish at thermal pools.
Lesson: learn basic plant identification and basic field techniques.
Lecture: Andean tectonics and biogeography

Day 3: Fly from Quito to the Island of Baltra, final destination Island of Isabela
Activities: Travel to Isla Isabela by plane and speed boat
Lesson: NPG development, rules, and regulations
Lecture: Galápagos island tectonics and biogeography

**Day 4:** Galápagos island Isabela  
Activities: morning snorkel instructions at the Concha Perla lagoon; afternoon visit Isabela’s Giant Tortoise Breeding Center; explore Flamingo Lagoon  
Lesson: explore the mangroves and lagoon ecosystem; learn about conservation efforts on Galápagos; visit the unique salt-marsh ecosystem and the animals that have adapted to live there  
Lecture: Conservation and sustainability in Ecuador

**Day 5:** Galápagos island Isabela  
Activities: Visit Islole Tintoreras hiking and snorkeling with penguins, sea lions, marine iguanas, green sea turtle, and tropical fish; afternoon visit numerous coastal sites (potentially Playa del amor, El Estero, and Cerro Orchilla)  
Lesson: explore and learn about the costal and marine ecosystem; explore dry-forest lowland vegetation and costal ecosystem development; examine plant adaptations to different environments  
Lecture: Marine Ecology in the Galápagos

**Day 6:** Galápagos island Isabela  
Activities: morning hike the Sierra Negra Volcano, the world's second largest volcanic crater (6 miles in diameter and 300 feet deep), visiting both La Bocanilla and Volcan Chico; afternoon descend to Campo Duro, a private forest reserve on the flank of the volcano with an organic farm and giant tortoise rehabilitation center, eat dinner and sleep at Campo Duro  
Lesson: learn about highlands ecosystem ecology; visit different types of lava fields; examine colonization of lava by pioneer species; explore how to live sustainably on Galápagos.  
Lecture: Darwin, natural selection, speciation, and adaptation

**Day 7:** Galápagos island Isabela; Galápagos island Santa Cruz  
Activities: travel to Santa Cruz by speed boat; afternoon hike to Tortuga Bay with Monique and Pete or Darwin research center with Sandra  
Lesson: natural resource cycles of marine life in the Galápagos  
Free evening to work on project proposal, remember an outline is due before you leave Ecuador

**Day 8:** Galápagos island Santa Cruz  
Activities: travel day (students fly back to Quito)  
Group discussion: Trip summary

**Day 9:** Arrive in Burlington  
Activities: travel day (students fly back to US)