

Course Syllabus

BIO 366 / HON 366/ IDS 366

The Natural History of the Galapagos Islands and Ecuador II

I. Basic Information

Purpose: This course will provide direct, first-hand exposure to the natural history of the Galapagos Islands and Ecuador while the student participates in a faculty-led travel program to the region during Maymester. Students also will be able to experience and learn about the culture and history of Ecuador.

Course Description: An immersion experience to develop a deep understanding of the natural history (including geology, climate, and ecology of plants and animals) of the Galapagos Islands and mainland Ecuador, with a reflection on interactions between these and the history, culture and economics of the Islands and Ecuador from pre-colonial to modern times. Offered during Maymester. (Limited to students who will participate in the faculty-led travel program —a two-week, intensive trip to the Galapagos Islands and Ecuador.)

Course Prerequisites: BIO 365 / HON 365/ IDS 365 Natural History of the Galapagos Islands and Ecuador I. Permission of instructor (based on acceptance into the faculty-led travel program to the Galapagos Islands and Ecuador) and a signed contract and all fees paid in full for participation in the trip also are required.

Course Credit: 0.5 course credits (2 semester hours). Students will not receive a grade until the abroad experience has been completed and the final draft of the monograph has been submitted.

Requirements Met by this Course: When taken in conjunction with BIO 365 or HON 365 (and with the BIO 185 prerequisite completed), this course will fulfill the requirements for an Organismal Biology Option course. When taken in conjunction with HON 365 or IDS 365, this course will fulfill the requirements for a Natural Sciences Liberal Learning course with a laboratory component. This course also will fulfill the Global Perspectives Civic Responsibility Liberal Learning requirement. This course will fulfill the requirements for a capstone course for the Environmental Studies Concentration.

Course Instructor: Dr. Donald Lovett, Dept. of Biology.

Texts to Purchase: One of the following (as selected by the student):

Galapagos: A Natural History, M. H. Jackson. 1994.

Galapagos: A Natural History Guide, P. Constant. 2007.

Galápagos: A Natural History, J. Kricher. 2006.

II. Learning Goals

A. Content goals

1. Academic Goals. This course is intended to lead the student to develop an understanding of the following:

- a. The geographic regions and climatic zones of the Ecuador mainland and the Galapagos Islands, with particular attention given to altitudinal zonation and how the geography, geology (including soil conditions), ocean currents (including El Niño, La Niña, and up-wellings), and climate affect the distribution of terrestrial and marine ecosystems across the landscape of the mainland and the islands.
- b. How differences in the dispersal ability of various groups of organisms have affected the degree to which the flora and fauna of the islands are endemic (unique to the archipelago and to each island); how species that disperse readily (such as marine birds) are responsible for the colonization of the islands by other types of organisms, especially plant species; how humans are responsible for the historically-recent dispersal and introduction of species to the islands.
- c. How the degree of isolation of the islands and how differences in ecological conditions among the islands have led to adaptive radiation and the formation of endemic species or subspecies that often are distinct from one another among the islands and from their mainland ancestors.
- d. The ecological impacts of human populations and introduced species on the island ecosystems; the measures (including the eradication of introduced species) that have been taken to conserve/restore native species; the biological factors (including population genetics) affecting these conservation efforts.
- e. How geography, topography, climate, and distribution of natural habitats have affected the history, development, and economy of Ecuador; how these features have affected the distribution of human civilizations and populations, both historically and in recent times; the impact of historical events (including the rise and fall of the Incan Empire, arrival of Europeans, and modern day industry, commercial exploitation of natural resources, and tourism) on the culture and economics of both mainland Ecuador and the Islands.

2. Trip-related Goals

- a. Appreciation for the history and cultural of Ecuador.
- b. Immersion experience for speaking Spanish. (Note: Students are not required to demonstrate proficiency in Spanish; all naturalists are fluent in English; all service providers in the hotels and on the cruise speak some English.)

- c. A rich cross-cultural experience. (Students experience first-hand aspects of Ecuadoran life and are able to interact with Ecuadorian nationals in a manner that is appropriate, polite, and respectful.)

B. Performance Goals

1. Students will demonstrate an understanding of material related to their assigned topic by preparing an illustrated monograph on their topic that will include a collection of photographs taken by participants in the program. Topics will include the following:

- a. Volcanism, tectonic plates, mountain-building processes, erosion, and geology.
- b. Ocean currents, prevailing winds (El Niño, La Niña), seasons, climatic zones.
- c. Sea birds (2 students)
- d. Land birds (2 students)
- e. Mammals (including marine mammals)
- f. Reptiles (2 students)
- g. Fishes and marine invertebrates (2 people)
- h. Trees, woody plants, vegetative zones (2 people)
- i. Non-woody plants, cacti, non-vascular plants, vegetative zones (2 people)
- j. Human influence on natural habitats (including introduced plants and animals)
- k. Conservation/restoration efforts, genetic diversity/maintaining biodiversity
- l. Political and economic issues (including ecotourism and environmentalism)

2. Students will maintain a field notebook using the 'Grinnell Method'. Students will demonstrate proper documentation techniques and will develop skills in observing and recording wildlife, vegetation, geology, and other pertinent ecological details. The notebook will include notes made during targeted observation periods in each major habitat or island (as assigned to the entire class by the instructor). For each student, notebooks should emphasize observations and interpretations related to the student's assigned topic and notes taken during narrated hikes and evening lectures by the naturalists.

3. In writing their monographs, students will demonstrate that they were able to apply the information that they had learned in BIO 365 / HON 365 / IDS 365 to their observations made during their abroad experience and to synthesize this information in the narrative of the monographs.

4. While in Ecuador, students will demonstrate an understanding of, and sensitivity to, cultural norms, expected behavior, and basic interpersonal civilities.

III. Student Assessment

A, Assessment Plan

1. At regular intervals during the trip, students will turn in their field notebooks for grading; the students will receive feedback on their implementation of the 'Grinnell Method' in their notebooks and on the completeness and effectiveness of notes on their field observations.

2. The first complete draft of the monograph will be due within one week following return to the U.S. (It is expected that students would have been working on their monographs during the faculty-led travel program.) The monograph will be evaluated on the basis of the learning goals and assessment goals listed above. Monographs also will be evaluated on the basis of the completeness of information that has been incorporated (including information from outside references and their field notebooks) and the degree to which the learning goals of the course were addressed with respect to each student's particular topic. Students also will be expected to incorporate a correlation of their observations with those of Charles Darwin in his various reports and his conclusions from his voyage. Students will be provided with written feedback on the first complete draft of their monograph and will have to submit a revised final monograph within an additional week. (This deadline has been developed in coordination with Records and Registration). For students who are enrolled for honors credit, the monograph will be expected to include substantial citations from primary research articles (for science topics) or to incorporate extensive information from supplemental readings relevant the topic (for non-science topics).

3. Student participation in discussions at the daily meetings (in which each day's observations and experiences will be summarized and reviewed) will be graded.

4. The instructor(s) will observe each student's interactions with host-country nationals and with other people encountered in Ecuador (including the Galapagos Islands). Formative evaluations of student behavior will be provided throughout the trip by the instructors.

5. Attempts by the student to utilize Spanish to engage with host-country nationals will be evaluated on the basis of the student's prior preparation in the language. Students will be expected to regularly utilize Spanish in basic interpersonal civilities.

6. Each student will be evaluated on his/her (a) demonstrated willingness to engage in all activities of the faculty-led travel program, (b) arrival for activities on time and prepared to participate, (c) demonstration of behavior during the abroad experience that is conducive to fostering a positive experience for all participants in the course and for others around them, that reflects positively on TCNJ, and that does not endanger the safety or well-being of himself/herself or others around them.

B. Rationale

1. The purpose of requiring that the 'Grinnell Method' be used for making field notes is that it can help the student to develop observational skills and can facilitate a complete and effective recording of observations, as well as interpretations of these observations. By requiring that students make notes using the 'Grinnell Method' and by grading these notes, students will be motivated to make more careful observations and to consider more deeply their observations, so that a less superficial view of the habitats is fostered.

2. The monograph will provide a mechanism for each student to synthesize information obtained before the trip (from in-class lectures, from textbooks, natural history guides, scholarly works and research reports, and on-line sources), information obtained during the trip (from

museums in Ecuador, information provided by Ecuadorian naturalists, the on-board library of the cruise ship), and from the student's own observations in the field. These monographs will incorporate and address relevant concepts listed in the course's Learning Goals. Furthermore, pdf files of all monographs will be assembled into a large electronic "reference" that will be distributed to each participant. The additional expectations added to those enrolled for honors credit are in compliance with Honors Program criteria.

3. Formative evaluation of the student's interactions with host-country nationals will allow for a richer cross-cultural experience and will help to enhance the immersion experience of all participants.

4. One objective of any abroad experience is for the student to learn to interact with people from other countries in a manner that is culturally and socially appropriate. In addition, host nationals typically are more likely to engage in a positive manner with those foreign visitors who attempt to follow social norms and customs of the local culture.

5. By expecting that a student should attempt to communicate in Spanish with host-country nationals, it is anticipated that the student may understand the power of such attempts in developing positive relationships with host-country nationals. Students who have not had previous training or experience in speaking Spanish will not be expected to acquire any level of fluency from the small amount of language training that they received before departing for Ecuador, while those who have studied the language previously would be expected to demonstrate a higher level of engagement and fluency.

6. In order to ensure the safety and well-being of all participants, to enhance the educational and cross-cultural experience for all participants, and to ensure the opportunity for future faculty-led abroad experiences to Ecuador, students will be held accountable for their actions by having their grade in the course dependent in part on their personal behavior during the trip.

C. Methods and Criteria

1. Each day while in the field, the class will be assigned specific localities or habitats in which they are to make detailed observations in their field notebooks using the 'Grinnell Method'. The notebooks will be collected on a regular basis and evaluated on the basis of the manner to which the method was implemented and the quality of the observations and interpretations made.

2. The monographs will be graded on the basis of thoroughness and extent to which salient details from the assigned topic are organized and the extent to which relevant concepts from the Learning Goals of the course are addressed. The quality of the actual writing also will be assessed. A list of comments and suggested editorial changes will be provided to the student in order to improve the quality of the final reference text created by the students.

3. Instructor(s) will maintain a record of student participation, performance and behavior during the program. Evaluation will be subjective, but based upon norms typical for participants in such trips.

IV. Learning Activities

A. Summary of Learning Activities

1. Students will spend the first nights in Ecuador at a hacienda in a botanical preserve which includes upland tropical forests and upland grasslands. Opportunities for short hikes and extensive bird watching are available on the property of the hacienda.

2. Students will spend a day in Quito, visiting the following (tentative itinerary): (a) the natural history museum at the National Polytechnic School (where there are dioramas of the various Ecuadoran habitats; these dioramas are similar to those in the American Museum of Natural History. Students will learn about the various climatic zones and ecosystems in Ecuador at this museum); (b) the Central Bank Museum of Quito (which features Ecuadoran cultural artifacts from as far back as the Incan empire); and (c) cathedrals built in the 16th and 17th centuries (works of art and artifacts from these periods are on display in their basilicas and museums). Other optional sites within the Old Town area of Quito also will be available for the students to visit during their free-time in the afternoon. The group then will visit the equatorial monument and the Ethnographic Museum at Mital del Mundo to learn about indigenous peoples of the region.

3. Students will travel with a local naturalist along the EcoRuta Paseo del Quinde (Trail of the Hummingbird Ecological Route) of Ecuador. This route will be followed from the Andean highland habitat at 9,300 ft elevation down to the sub-tropical cloud forest in Tandayapa at 3,700 ft. The greatest density and diversity of birds per acre in the world exist along the corridor of this ecological route. In Tandayapa, the naturalist will lead a half-day hike into the cloud forest, where students will discover the local flora and fauna, focusing on local birds (especially humming birds), insects (especially butterflies), and orchids.

4. The group will fly to the Galapagos Islands and spend 8 days on board a 20-passenger cruise ship to visit 10 different islands in the archipelago. The daily schedule will be as follows: 3 hours in the morning visiting one island location with a naturalist (in groups of 10) and 3 hours in the afternoon visiting another location or island. The naturalists are trained and certified by the Galapagos National Park System. During each of these hikes, the naturalist will provide a continual narration on the natural history of the area, as well as details of cultural history and impacts of humans and introduced species. Included in the natural history topics covered by the naturalist will be geological processes, climate, ocean currents, basic ecology of each species, and evolutionary processes that have led to the current species on the island. In addition, about 2 hours each day are available for snorkeling in the shallows to observe the marine life (including diving birds, sea turtles, and sea lions) and for making individual observations for the field notebook. The ship has an extensive library of field guides, natural history books, and books on evolution that is available for students to use in preparing their daily notes (that will later be incorporated into their monographs). Each evening before dinner, the naturalists provide a 30

minute PowerPoint presentation (on a wide-screen monitor) about the sites to be visited the next day and some background information on the species that will be encountered. Each evening after dinner there will be a group meeting in which students will share notes and observations from their field notebooks and will report on details pertaining to their specific topics. Furthermore, students will submit photographs of the day's excursions for sharing with the group via PowerPoint as a way to review the day's experiences. (Photographs taken by participants will be collated and distributed for later use by students to illustrate their monographs). While on Santa Cruz Island, students also will visit the Darwin Research Center, and on San Cristobal Island students will visit the Galapagos Islands Interpretive Center.

5. Meals in the course of the trip will incorporate traditional and local foods and fruits.

6. The first complete draft of the monograph on each student's assigned topic will be reviewed by the instructor (with comments provided), edited by the student, and then compiled into a single pdf electronic reference, so that each student will have a personal copy of all monographs submitted by members of the class.

B. Rationale

The itinerary of the trip has been designed to maximize the breadth of the natural history of Ecuador to which the students are exposed. In addition, the itinerary includes visits to natural history, cultural, and ethnographic museums and to sites of historical events that shaped the country. Finally, the itinerary provides opportunities to learn about and observe first-hand the culture of the Ecuadoran people and to become directly immersed into the culture of the country.

V. Course Grading:

Daily review of Field Notebooks	40
Participation in daily discussions	40
Cultural sensitivity, use of Spanish	20
Attitude, contribution to safety and success of the group	50*
<u>Monograph</u>	<u>100</u>
Total	250

* -- Note: Engaging in behavior which endangers a member of the group, which damages property or which substantially detracts from the experience for the group (including failure to arrive at an event at the specified time), failure to participate fully in organized activities, failure to engage in cooperative learning, failure to respect the natural habitat, or failure to follow rules or specific instructions from governmental officials, naturalists/guides or the instructor(s) may lead to substantial additional penalty, including receiving a failing grade in the course.

VI. Additional Details:

1. Cooperative learning: Student contributions to the class are essential to the success of the experience. Students will each bring a variety of backgrounds and experiences, which makes each student a unique educational resource. Students should feel free to ask questions; other students are expected to be respectful of students who are asking questions and to be helpful in assisting other students learn or understand material. An important component of the learning experience will be asking questions, sharing observations with the class, and listening to what the instructors, naturalists, and classmates have to say.

2. Academic Integrity. Science is a collaborative process. Therefore, students are encouraged to work together both to complete the assigned work and to learn material. *However, when it comes to writing essays or the monograph, each student must do his/her own work independently.* In addition, where information included in the monograph is derived from a print or on-line source, proper citation must be given. Students should avoid use of direct quotes, and should paraphrase all details obtained from sources. (Consult the TCNJ Academic Integrity Policy regarding consequences for submitting the work of others as your own (i.e., plagiarism): <http://www.tcnj.edu/~studlife/judaff/academic.html>).

3. Students with Differing Abilities. The following information comes directly from the tour company that arranges the cruise: “Passengers able to walk a few hours a day unassisted will be able to fully enjoy the Galapagos. Some of the excursions require more physical activity than others and involve short steep climbs or long walks in hot weather. However, most excursions require moderate activity and the walks are at a leisurely pace. Entering and exiting the *pangas* (local word for dinghies) require that you need to be reasonably fit and sure footed.” The conditions encountered when visiting the islands are beyond the control of TCNJ; students concerned about these requirements should consult with the faculty members leading the trip or with the TCNJ Office for International and Off-Campus Programs.

Course Outline

BIO 366 / HON 366 / IDS 366 The Natural History of the Galapagos Islands and Ecuador II

- | <u>Day</u> | <u>Activity</u> |
|------------|---|
| 1 | Fly to Quito, stay at Hosteria San Jorge Botanical Reserve in the foothills of mountains above the city. |
| 2 | Visit Quito destinations, including the natural history museum at the National Polytechnic School, the Central Bank Museum of Quito, the San Franciscan cathedral and museum (constructed in 1534), and the basilica and museum of the Society of Jesus (constructed in 1603). Students will have the afternoon free to visit other churches, the national palace (and its museum), various historic parks, and a fair-trade handicraft market in the Old Town district. Later in the day, students will visit the Mital del Mundo equatorial monument and Ethnographic Museum to learn about indigenous peoples of the region. |
| 3 | Travel along the EcoRuta Paseo del Quinde (Trail of the Hummingbird Ecological Route) from the Andean highland habitat down to the cloud forest of Tandayapa. In Tandayapa, a naturalist will lead a half-day hike into the cloud forest. Lunch will be served at the San Jorge Lodge in the Tandayapa Hummingbird Reserve. |
| 4-11 | Fly to Galapagos Islands and cruise to various islands; narrated hikes led by park naturalists. Islands to be visited (tentative itinerary):
San Cristobal
Genovese
Fernandina
Isabella
Santiago
Bainbridge Rock
Bartolome
Seymore Norte
Santa Cruz (including Darwin Research Center)
Española |
| 12 | Free Day in Quito. |
| 13 | Return to U.S. |
| 20 | First draft of complete monograph due. |
| 27 | Final draft monograph due. |