Course Syllabus

BIO 366 / HON 366/ IDS 366
The Natural History of the Galápagos Islands and Ecuador II
- 2017 -

I. Basic Information

Purpose: This course will provide direct, first-hand exposure to the natural history of the Galápagos Islands and Ecuador while the student participates in a faculty-led travel program to the region during Summer Session I. 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 Galápagos Islands and continental 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 Summer Session I. (Limited to students who will participate in the faculty-led travel program —a two-week, intensive trip to the Galápagos Islands and Ecuador.)

Course Prerequisites: BIO 365 / HON 365/ IDS 365 Natural History of the Galápagos Islands and Ecuador I. Permission of instructor (based on acceptance into the f faculty-led travel program to the Galápagos 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):

Galápagos: A Natural History, M. H. Jackson. 1994.
Galápagos: 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 continental Ecuador and the Galápagos 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 continental 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 ship 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:

1. Tectonic plates, hydrothermal vents, volcanism, types of lava, mountain-building, and geology
2. Ocean currents, prevailing winds (El Niño, La Niña), seasons, climate
3. Sea birds
4. Wading birds and shore birds (including freshwater birds, such as ducks)
5. Land birds (on the islands)
6. Mammals (including marine mammals and terrestrial species)
7. Reptiles
8. Fishes (marine, pelagic/oceanic, brackish)
9. Marine invertebrates (including coral reefs and hydrothermal vent animals), macrophytic algae, and marine habitat formation
10. Terrestrial, brackish, and freshwater invertebrates, freshwater habitats including fish
11. Woody plants, vegetative zones of the islands
12. Non-woody plants, cacti, non-vascular plants, vegetative zones of the islands
13. Ecological zones in continental Ecuador (inter-montane arid zone, tropical montane cloud forest, *páramo*, montane rainforest, EBA's, IBA's, Choco & other biodiversity hotspots, Cayembe Coca Ecological Reserve)
14. Introduced species, their impact, and their eradication; habitat restoration efforts, maintaining biodiversity.
15. Human influence on natural habitats (other than introduced species and habitat restoration); includes impact of residents/immigrants (population growth), water conservation, waste disposal, agriculture, fisheries and other harvesting, tourism, conservation efforts, maintaining biodiversity/reducing human impacts)
16. Political and economic issues (including ecotourism and environmentalism)

2. Students will maintain a field notebook using the 'Grinnell System'. 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 monograph narrative.

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 journal pages and species account pages for grading; the students will receive feedback on their implementation of the 'Grinnell System' 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 notes and observations made during the faculty-led program, including, but not limited to, information provided by the Galápagos National Park guides and displays at the interpretive center. 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 a week after returning from Ecuador. (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 topi**cs)** or to incorporate extensive information from supplemental readings relevant to 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 Galápagos Islands). Formative evaluations of student behavior will be provided throughout the trip by the instructors.

5. Attempts by the student to utilized 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 for 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 System' 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 System' 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, while those who have studied the language previously would be expected to demonstrate an appropriate level of engagement and fluency. In addition, host nationals typically are more likely to engage in a positive manner with those foreign visitors who attempt to speak their language, no matter how awkward or unsuccessful the visitor's efforts may be.

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 System'. The transcribed journal pages and species account pages will be collected regularly and evaluated on the basis of the manner to which the Grinnell method was implemented and the quality of the observations and interpretations made.

2. The monographs will be graded on the basis of thoroughness and the 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. The instructor 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 two nights in Ecuador in Quito. On Saturday, the group will visiting the Central Bank Museum of Quito (which features Ecuadoran cultural artifacts from as far back as the Incan empire) and cathedrals built in the 16th and 17th centuries (works of art and artifacts from these periods are on display in their basilicas and museums), and other sites within the Old Town area of Quito.

2. The group will fly to the Galápagos Islands and send 8 days on board a 20-passenger cruise ship to visit several 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 Galápagos 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 in 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 will provide a 30 minute PowerPoint presentation (on a wide-screen monitor) about the sites to be visited the next day and about 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. (Photographs taken by

participants will be collated and distributed for later use by students to illustrate their monographs). While on Santa Cruz Island, students will visit the Centro de Crianza Fausto Llerena (Fausto Llerena Breeding Center, formerly named the Darwin Research Center), and on San Cristobal Island students will visit the Galápagos Islands Interpretive Center.

3. On our second Sunday in Ecuador, the group will return to Quito and travel by bus from the Andean highland habitat down to the sub-tropical cloud forest in Tandayapa (at the Bellavista Cloud Forest Reserve & Lodge at 5,500 ft). The greatest density and diversity of birds per acre in the world exist along the corridor of this ecological route called the EcoRuta Paseo del Quinde (Trail of the Hummingbird Ecological Route). Early the next morning, the naturalists will lead those who are interested on a short hike to do some bird watching. After breakfast the entire group will go out on 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 (esp. butterflies), and orchids.

4. After lunch, the group then will travel to the Otavalo area, stopping to examine a number of habitat types, including the inter-montane rain shadow desert and the upland forests. We will spend the next two nights in homestays in the village of San Clemente. On the first morning we will learn about Quechua beliefs and farming practices, followed by a medicinal plant hike. Students will have the option to continue with the hike or return to the village center. The members of the village will host a traditional banquet for lunch. In the afternoon we will spend time in the village learning more about village life. After dinner with your host family, we will attend a performance of indigenous dance and music by a local troupe.

5. The next morning, students will visit the open-air markets of Otavalo (Mercardo Centro and Plaza de Panchos). From there we will travel to the nearby town of Cayambe to visit the Quitsato sundial, in order to learn about the ancient Incan knowledge of astronomy. From there we will continue on to Papallacta, where we will enjoy the natural hot springs.

6. On the last day, there is an optional hike (around the resort or up into the Cayambe-Coca Ecological Reserve) and an opportunity throughout the day to relax in the hot springs or take advantage of the spa services. After dinner we head to the airport for our return flight home.

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

8. 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 and cultural 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:

Field journal pages and species account pages	40
Participation in daily discussions	40
Cultural sensitivity, use of Spanish	20
Attitude, contribution to safety and success of the group	50*
Monograph	100
Total	250

* -- Note: Engaging in behavior which endangers a member of the group, damages property or which substantially detracts from the experience for the group, or adversely affects the reputation of TCNJ, failure to participate fully in organized activities, failure to arrive on time and prepared for daily departures, failure to engage positively in cooperative learning, failure to respect the natural habitat, or failure to follow rules or specific instructions from government officials, the ship's captain, naturalists/guides or the TCNJ instructor(s) may lead to substantial additional penalty, including receiving a failing grade in both courses (365 and 366).

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 Galápagos. 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 Center for Global Engagement.

Course Outline
BIO 366 / HON 366 / IDS 366
The Natural History of the Galápagos Islands and Ecuador II
2017

Day	**Activity**
May 19	Fly to Quito, stay at Hotel Real Audiencia in the Old Town section of the city.
May 20	Visit Quito destinations, including the Museo Nacional Banco Central del Ecuador, the Basilica del Voto Nacional, historic Heladería San Agustín (for lunch, established 1858), Plaza Independencia, the Iglesia de La Compania de Jesus (constructed in 1603) and its museum, and the Iglesia y Monasterio de San Francisco (constructed in 1534) and its art museum. After dinner, visit historic Calle la Ronda and enjoy salsa dancing with locals.
May 21-28	Fly to the Galápagos Islands and board cruise ship; narrated hikes led by Galápagos Natation Park naturalists. Islands to be visited (subject to change by GNP): San Cristobal, Genovesa, Fernandina, Isabella, Santiago, Rábida, and Santa Cruz.
May 28	Fly to Quito. 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 at the Bellavista Cloud Forest Reserve & Lodge.
May 29	Enjoy early morning bird watching, followed by a half-day hike in the cloud forest. Lunch will be served at the lodge before traveling by bus to Imbabura Province to spend two nights in homestays with indigenous Quichua families in the village of San Clemente.
May 30	Learn about Quichua beliefs and farming practices, followed by a medicinal plant hike. Optional extended hike. Traditional banquet lunch hosted by the villagers. After eating dinner with a host family, attend a performance of indigenous dance and music by a local troupe.
May 31	Visit the open-air markets of Otavalo (Mercado Central and Plaza de Panchos), travel to the nearby town of Cayambe to visit the Quitsato sundial, and then continue on to Papallacta, where we will enjoy the natural hotsprings at Termas Lodge.
June 1	Optional hikes around the resort or into the Cayambe-Coca Ecological Reserve. Relax and enjoy the hot springs and spa. After dinner head to the Quito airport for return flight home to the U.S. in late evening.
June 2	Arrive home in the U.S. later in the morning
June 12	Completed monograph due.