ETSU Study Abroad: "Evolution of Biodiversity in Ecuador and Galápagos"

EVOLUTION OF BIODIVERSITY IN ECUADOR & GALÁPAGOS:
A new ETSU Study Abroad course for Summer 2015

Instructors: Dr. Tim McDowell and Dr. Tom Laughlin, ETSU Department of Biological Sciences

Credit hours: 3. (1 hour lecture, 2 hours field/lab). Prerequisites: BIOL 1 & 2 or permission of the instructors. Biology majors distribution credit: Population menu. Course open to both Undergrad and Grad students.

Course location: Multiple sites in Ecuador, including the one week in the Galápagos Islands, and two weeks in the Andes and the Oriente (Amazon) regions.

Course dates: June 2015, three weeks including travel to-from Johnson City. Exact dates depend on cruise arrangements.

Major course themes: Evolutionary biology and Biological Diversity:
I. Concepts in evolutionary biology:
- founder populations: plant endemics with continental sister species, bird groups
- niche partitioning: finches, fishes, marine iguana vs land iguana.
- adaptive radiations: finches, iguana subspecies, crabs?
- life histories: sea lions, seals, tortoises, boobies, frigate birds, iguanas, crabs, etc.
- allopatric speciation: finches, endemic plant species, iguanas, etc
- history of Darwin's visit, collecting, changing understanding of species

II. Concepts in biological diversity:
- global biodiversity hotspots
- relative biodiversity of regions in Ecuador (Galápagos, Sierras, Oriente, Coast)
- origins of biodiversity on oceanic islands
- plant diversity: super-diverse plant families by region
- habitat isolation and species diversity
- coevolution: symbiotic interactions of plant-animal-fungi-bacterial species

Learning outcomes:
At the conclusion of this study abroad field course, students should be able to:
- compare and contrast the biological diversity observed at multiple tropical habitats, including marine, coastal, montane, and rainforest regions.
- interpret and comment on evolutionary mechanisms and life history processes represented in the organisms and communities visited in the Galápagos, the Sierras and the Oriente regions of Ecuador.
- produce a descriptive nature log of many diverse plants and animals introduced during field trips, supplemented with photos and drawings or figures as appropriate.
- describe basic vegetative and reproductive structures of plants and recognize various families of tropical plants
discuss conservations efforts with respect to the public and private lands visited during our Ecuador travels

Course readings:
Students will prepare for the trip by reading in advance *The Galápagos: A Natural History*, by Henry Nicholls, 2014 (Basic Books), an introduction to the archipelago. There will be a course library available during the course travels with many natural history books. Scientific articles will be provided for special topics discussions during the course.

Grading: Students' grades for the course will be based upon the following activities:
- Course journal: 30
- Predeparture test on reading assignment: 20
- Post-trip test on course content: 20
- Quizzes during course: 15
- Participation in field activities: 15
- Total points: 100

The Course journal will be written on a daily basis by each student, and will include observations and comments concerning the field trips, lectures and readings.
The Predeparture test may be taken a second time, near the end of the course, for a lower maximum score of 15 points. It will be given during the first two days of the course.

The Post-trip test will be comprehensive and may include material covered in the readings, the field trips, and the course lectures or discussion sessions.

The Quizzes will be given in the field or during lecture sessions, and will concern basics of plant and animal biology and ecology, comparisons of various habitats, and evolutionary concepts discussed during the course.

The Participation points will be based on students' daily involvement in course activities, including field trips, discussions, and lectures.

**Tentative Itinerary:**

<table>
<thead>
<tr>
<th>Day</th>
<th>Activity notes</th>
<th>Location</th>
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<tbody>
<tr>
<td>1</td>
<td>Travel Johnson City - Quito Ecuador</td>
<td>Quito</td>
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<tr>
<td>2</td>
<td>Quito EC. AM- Botanical Garden, Reptile exhibit PM- Historic Quito</td>
<td>Quito</td>
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<tr>
<td>3</td>
<td>flight to Galápagos islands (AM) begin tour of Galápagos Islands</td>
<td>Galápagos</td>
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<tr>
<td>4</td>
<td>touring Galápagos Islands, on boat</td>
<td>Galápagos</td>
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<tr>
<td>5</td>
<td>touring Galápagos Islands, on boat</td>
<td>Galápagos</td>
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<td>6</td>
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<td>8</td>
<td>touring Galápagos Islands, on boat</td>
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<td>9</td>
<td>touring Galápagos Islands, on boat</td>
<td>Galápagos</td>
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<tr>
<td>10</td>
<td>end boat tour, return flight to Quito</td>
<td>Quito</td>
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<tr>
<td>11</td>
<td>travel to Baños</td>
<td>Baños</td>
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<tr>
<td>12</td>
<td>hike and other activities</td>
<td>Baños</td>
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<tr>
<td>13</td>
<td>open day for students</td>
<td>Baños</td>
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<tr>
<td>14</td>
<td>travel to Puyo, walk along river, visit university</td>
<td>Puyo</td>
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<tr>
<td>15</td>
<td>Omaere ethnobotanical garden</td>
<td>Puyo</td>
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<tr>
<td>16</td>
<td>rainforest Jatun Sacha, monkeys Mishwalli</td>
<td>Puyo</td>
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<tr>
<td>17</td>
<td>travel to Otañalo</td>
<td>Otañalo</td>
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<td>18</td>
<td>Peguche waterfall, Condor Park, El Lechero</td>
<td>Otañalo</td>
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<tr>
<td>19</td>
<td>hike, Cuicocha Lake, museum, Cotacachi</td>
<td>Otañalo</td>
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<tr>
<td>20</td>
<td>return to Quito</td>
<td>Quito</td>
</tr>
<tr>
<td>21</td>
<td>return flight to Johnson City</td>
<td>Johnson City</td>
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**Course cost:**

- **Course travel in Ecuador:** $3500. (including Galápagos week-long cruise)
- **(includes: full week Galápagos tour to many islands; all hotels and meals for two weeks on mainland Ecuador; all transportation within Ecuador, to the Galápagos Islands; all entrance fees)**
- **International flight to Ecuador:** $1000. (Tri-Cities to Quito round trip, prices range $850-$1200)
- **Tuition and fees (undergrad):** $1000. (payment for 3 credit hours tuition and fees)

**Total cost for completing this course:** $5500. (close estimate, subject to change)

**Scholarships:**

Scholarships for ETSU Study Abroad programs are available to students with minimum GPA of 2.75. Both undergrad and grad students may receive scholarships for Study Abroad courses. Scholarship awards depend on the student's application and student need, and may cover ½ of the total costs plus an additional $1000 for highly qualified students. Thus, qualified ETSU students are eligible for scholarships of $2750 - $3750 for this course.

Information on ETSU Study Abroad scholarships is on-line at the Honors College, International Programs site here: [http://www.etsu.edu/honors/international/abroad/scholarships/education.aspx](http://www.etsu.edu/honors/international/abroad/scholarships/education.aspx)

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