122-01 123-01 Tropical Biodiversity in Costa Rica

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Syllabus for BIOL 122/123 Tropical Biodiversity in Costa Rica

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Student learning outcomes:

- Students will be introduced to the diversity of organisms in the Neotropical ecosystems of Costa Rica and learn to recognize and identify a variety of species of plants and animals in the field.
- Students will develop a research topic concerning the conservation and/or management of natural resources in the Neotropics.
- Students will observe first-hand some of the threats to conserving tropical biodiversity in a developing country and the biological concerns of agricultural production.
- Students will develop hypotheses addressing aspects of the tropics related to their particular experiences. Students will design research projects to collect data to test specific predictions. They will summarize, analyze, and present these data and results addressing their hypotheses.

Overview of course & grades (600 total points):

**Before trip preparation** due (via email to Dr. Ray) by Dec 27th:
- Pre-trip packet on textbooks (100 points)
- Project [Conservation/management of natural resource] (100 points)

**In country assessments:**
- Powerpoint presentation on research article (50 points)
- Participation in discussions and personal conduct (50 points)
- Field identification quizzes (40 points)
- Research project conducted in Costa Rica (group project; 60 points)

**Post-trip assignments** (due early in spring semester):
- Final exam (100 points).
- Flushed-out experimental proposal (100 points).

**Before-trip Assignments:**

Students will read the *Nature of the Rainforest* book and respond to a series of questions. Students will also read a supplemental article on agricultural issues concerning chocolate production. There will be a short worksheet designed to introduce students to the identification of plants and animals we will encounter on our trip. These questions will be handed out in the December meeting.

Also before leaving for Costa Rica, students will develop a project to address some issue relating to conservation or management of natural resources in Costa Rica. You are encouraged to work with Dr. Farnsworth and Dr. Ray to find a topic that aligns with your interests. One example of a topic is to examine the challenges and environmental impacts of specific agricultural products in a tropical setting. Bananas are a large and important crop in the tropics in general and in Costa Rica in particular with a very interesting history of economic and environmental impacts. Bananas also have an uncertain future. Similar projects could be developed concerning Chocolate, Coffee, or Pineapples. Other projects could address government policies or impacts of ecotourism.
Students must work with Dr. Farnsworth or Dr. Ray to develop an outline of the project that must be approved before Dec. 12th.

**During Trip:**

While in Costa Rica, students will present a summary of their project with a computer-aided (e.g. Powerpoint) presentation to the class and lead a discussion. This presentation must be organized and informative and use visuals that help illustrate the main points of the project.

There will be two field practical quizzes (20 points each). Students will be expected to identify approximately 10 tropical plant families from the characteristics observed in the field. In addition, students will learn to identify a variety of animals, including representative mammals, reptiles, amphibians, birds, insects, and other invertebrates. The quizzes may include additional details about field specimens such as distinctive behaviors or human uses.

In the evenings, students will participate in discussions. In addition to presenting their own work, students are expected to be engaged in the discussions of other student’s research. There will also be presentations by local experts on current conservation issues in Costa Rica.

Students will also work in small groups to design a research project. This project must include a hypothesis that directly leads to a specific prediction. Groups will then perform a test of that prediction by collecting appropriate data and analyzing the results. Toward the end of the trip, groups will present their work to the class.

**After returning from Costa Rica:**

Dr. Farnsworth and Dr. Ray will send a post-trip test consisting of a series of questions designed to synthesize our experiences in Costa Rica with the readings and discussions relating to Neotropical ecology. This will be an open-note, open-book, take-home assignment.

Each student will also write a research proposal to address a question related to a specific experience s/he had while in Costa Rica. This assignment requires an explicitly-described hypothesis. From that hypothesis, the student will make a specific testable prediction. The assignment is to describe a realistic methodology that could be used to collect data that will test that specific prediction.