TROPICAL DIVERSITY COURSE SYLLABUS

Biological diversity is a very extensive topic. In this course we will discuss diversity with particular emphasis on the Neotropics. We will speak about what “diversity” means, the components of diversity, the fundamental importance of ecological interactions in diversity, species extinctions, current hypotheses about higher diversity in the tropics, diversity measurement methods, biological conservation, effects of forest fragmentation and the biological importance of protected areas. In your reader, you will find useful papers for class discussion and your own understanding, but you are welcome to complement each topic with more information and with your own perspective.

LECTURES

1. Climate and biological diversity of Costa Rica
2. What does “diversity” mean?
   Diversity components $\alpha$, $\beta$ and $\gamma$
   Species Richness
   Indices and the True Diversity Measurements
3. What is a species?
   Speciation
4. Evolution, Biogeography and Diversity
5. Latitudinal patterns of species richness
   Ecological interactions
6. Biological conservation
   Fragmentation and Contemporary Defaunation
7. Species extinction
   Forest restoration

EVALUATION

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<td>I Practical test</td>
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<td><strong>Total</strong></td>
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<td><strong>Taxonomic specialization</strong></td>
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Note: class and excursion dates are subject to change.

Rev: 9/2014
EVALUATION EXPLANATION

Practical tests
Practical tests will evaluate mostly field-trip information: orientation walks, group projects, workshops (for example plant families, insect orders), but might include night-talks. You should learn and memorize taxonomic terms (species, family, etc.) and biological aspects about the organisms observed in the field. Your main resource to study for the practical test is your field notebooks (but you may not use notebooks during either of the two practical tests).

There are three simultaneous sections in the first practical test: slide, table and trail. The group is divided into three sub-groups, one for each section; once you finish one section you will switch and go for the next one. For the first practical test we will provide paper to record your answers. The second practical test consists of two non-simultaneous sections: table and trail, or only one of those, depending on the weather during the Peñas Blancas field trip. For the second practical test, you should provide the paper for your responses.

Usually each question in the practical test includes two parts: (A) and (B). Usually part (A) is identification (common name, species, family or order, and we will state very explicitly what we are asking). Usually the part (B) is about “any aspect” discussed during the field trip (ecology, behavior, distribution, natural history, evolution or other aspect).

Slide section: In this section, we will show about 12 photographs (one every two minutes) of: organisms, sites visited, people, ecosystems, etc. In other words, everything that we all saw during the field trip is fair game. Example: A picture of a leaf-cutter ant (*Atta cephalotes*) that you saw in the island, and we may ask:
(A) Name this organism (common or scientific name).
(B) Describe briefly two factors that might prevent this species from establishing a breeding population on Isla San José.

Table section: In this section, we will ask between 12 and 15 questions about specimens displayed on a table, with one chair per question for you to sit and work. After two minutes per question, you will switch to the next question. Table-section questions may consist of: a living organism, a museum specimen, an insect on a pin, etc. This section will likely emphasize insect related questions.
Example: We show you a singing mouse in a kennel box, and we may ask:
(A) State the order of this animal.
(B) Explain briefly, what is the function of the structure on its larynx indicated in the photo?

Trail section: We will do this section outside in the field, and identify between 12 and 15 plant families or genera. After two minutes per plant, you will switch to the next plant. This section will emphasize on plants.
Example: A *Piper corrugatum* plant (Piperaceae) in the forest, and we may ask:
(A) State the genus of this plant.
(B) Name the most likely seed – dispersers of this plant.

Mid – term
This test is mostly about lectures (classroom and “lecture-lets” during the field trips), class discussions, readings, seminars, night-talks, sites visited, people, and ecosystems. The Tropical Diversity mid – term could include multiple choice questions and/or short answers. You will work independently, and the test will take two hours. It is open-book, open-notebook and open-reader. Please note that internet will not be available for this test. You will decide where you want to work on this test (classroom, library, balcony, forest, etc.). Staff will be available in the Station during the test time for any additional clarification.

Final:
This test is also about lectures, readings, seminars, night-talks, everything that we all saw. It is a take-home test, and you will have some days to work independently on it. Usually this test includes four or five exercises. You will submit this test electronically.
**Homework:**
Homework will be announced and explained. You will submit your homework assignments electronically.

**Quizzes:**
These are brief evaluations about lectures, readings, or night-talks. They will not be announced.

**Taxonomic specialization:**
This optional activity allows you to learn more taxonomic aspects and how to recognize and identify members of a given group selected by you.
Here are some examples of former taxonomic specializations:
- Species in the genus *Piper* in Monteverde.
- Species of Cetacea in Golfo de Baja California.
- Species of Phyllostomidae in Peñas Blancas.
- Families of Coleoptera around the Estación Biológica Monteverde.

Each student doing this activity should indicate the taxonomic level of the group that she/he wants to learn about, as well as a “delimited” geographic area. If you opt to do this, you need to discuss with me the group you will focus on, and then send a written note.

The taxonomic specialization is worth 4% of your final grade; if you choose a taxonomic specialization, you will be under a slightly different evaluation scheme, in which the First Practical test will be worth 23% (instead of 25%) and the Second Practical test will be worth 13% (instead of 15%) of the final grade. Each student doing a taxonomic specialization will be evaluated independently in an oral test. The main benefit of this independent and optional activity is the taxonomic knowledge obtained by you.