Objective

In this course we will analyze the fundamental theories that explain the structure and dynamics of plant and animal populations and communities in tropical ecosystems, both in ecological and evolutionary time. We will study the different types of terrestrial and aquatic tropical ecosystems, and we will examine the main methods to sample and describe populations and communities in theory and in practice. Moreover, we will analyze the diverse Ecuadorian ecosystems (e.g. tropical rain forest, páramo, dry forest), their fauna, flora, cultures, protected areas and the main environmental issues affecting them.

Teaching Methodology

Students will attend lectures and read the assigned materials carefully before coming to class in order to be prepared to discuss them. Students will be required to give short (10 minutes) presentations of assigned articles. The presentation should include a summary of the article and a commentary of the articles’ quality. This oral presentation is a communication exercise, student’s goal is to effectively communicate to the audience what he or she reads.

Lectures will be complemented with field work and assignments to apply some of the methodology reviewed in lecture. Students will have to present written reports of the field practices. The report should include a brief introduction, a detailed description of the study area and methods, a section of results and discussion and a list of references. Oral presentations of field practices will be required.

This course will have a midterm exam and a final exam. The exams will cover lectures and text material. Any academic dishonesty on the exam or papers will result in a failing grade for the course.

Course Contents

- Introduction to tropical ecosystems (world distribution of tropical climates, biogeographical, regions, main Ecuadorian ecosystems)
- Deserts and environmental factors (main tropical deserts, environmental factors and plant and animal distributions, Ecuadorian deserts)
- Grasslands and primary production (grass structure and biology, photosynthesis, assessment of grassland primary production, effects of grazing on grass growth, primary production rates in terrestrial biomes, Ecuadorian grasslands)
- Savanna and population dynamics (main savannas, herbivores and herbivory, principles of population growth, factors determining population density, density dependent and independent mortality factors, competition, predation)
• Lakes, energy flow and biogeochemical cycling (thermal stratification, food chains and energy flow, trophic levels, food web dynamics, biogeochemical cycles, eutrophication, main tropical lakes)
• Rivers, floodplains and estuaries (flood-pulse concept, river continuum concept, main tropical rivers, Ecuadorian rivers)
• Wetland and succession (wetland zonation, wetland succession, ecological succession, main tropical wetlands, Ecuadorian wetlands)
• Tropical rain forest and biodiversity (vegetation structure of tropical rain forest, plant-animal interactions, micro-climates and resource acquisition, biological diversity, gap theory, patch dynamics, main tropical rain forests, Ecuadorian rain forest)
• Montains, zonation and community gradients (zonation on tropical mountains, main tropical mountains, the páramo ecosystem)
• Global ecology: biodiversity conservation, climate change and sustainable development

Grading

Attendance and class participation 10%
Article presentation 10%
Midterm Exam 10%
Reports of field work 30% (15% written report and 15% oral report)
Assignments 20% (10% each)
Final Exam 20%

Scale: A=100-91, B=90-81 , C=80-71, D=70-61, F=<60

Main Text Book (MTB)

Support Texts (in the library)

Readings


Oral presentations (OP)


