FUNDACION CENTRO DE ESTUDIOS INTERAMERICANOS, CEDEI

ENV 340 Conservation Biology

Conservation biology emerged as an important new discipline during the 1980s in response to the alarming loss of biological diversity throughout the world, a result of rapid growth of the human population and the expansion of human activities. This course is an introduction to conservation biology with an emphasis on Latin America.

We will first introduce general concepts of conservation biology and biodiversity at the species, genetic and ecosystem levels before going on to overview the main threats to biodiversity, discussing mainly examples from Latin America, and then consider the various problems faced by small populations of endangered species. We will discuss conservation strategies for individual populations and species, and for communities and ecosystems, both from theoretical and practical standpoints, taking into consideration the problems faced by conservation biologists in developing countries.

Throughout the term, students will carry out an original investigation on a topic of their choice. There will be a maximum of one homework assignment each week.

Course Objectives

1. Understand the scientific use of the term biodiversity and the ecological and evolutionary principles governing biodiversity at the species, genetic and ecosystem levels.
2. Identify the ecological, social and economic impacts of diversity loss and the need for biological conservation.
3. Identify the causes of anthropogenic impacts, the ways in which they affect species and ecosystems and impact human populations, particularly in developing countries.

4. Understand the management principles and methods used to conserve and restore biodiversity at species, population and ecosystem levels.

5. Understand the interdisciplinary nature of conservation biology and the roles of policy, culture and ethics in conservation.

Exams and grading

1. Mid-term exam 30%

2. Class work and assignments 10%

3. Final exam 30%

4. Term Project 25%

5. Oral presentation of project 5%

Text:

A Primer of Conservation Biology, Richard B. Primack, Sinauer Associates, 5th ed. 2012
Additional reading material is available.

Class 1

Introduction to Conservation Biology

Population growth and the global biodiversity crisis - what are we losing and does it matter? Origins and aims of Conservation Biology. Biological and social crisis in Latin America - implications for conservation. Interdisciplinary aspects of conservation biology.

Class 2

Video State of the Planet 1

Some successful conservation projects in Latin America

Class 3

What is Biodiversity?

Species diversity, - endemism, alpha, beta and gamma diversity. Species diversity in the tropics. Genetic Diversity. Ecosystem and community diversity and organization. Keystone species, Keystone resources.

Class 4

The Value of Biodiversity. Ecological Economics, Direct and Indirect Economic values, Option Values and Existence Values

Class 5

Endangered amphibians - endemism, value and ecological importance, threats, extinction crisis.

Threats to biodiversity part 1 (DVD) Video – State of the Planet 2 (if time)

Class 6

Threats to biodiversity part 2

Overexploitation. Habitat loss and fragmentation (student presentations)

Class 7

Threats to biodiversity part 3 (DVD)

Contamination. Blue Planet II Plastics in the ocean.

Class 8

Threats to Biodiversity part 4

Invasive species, disease. Examples from Galápagos

Class 9

Threats to Biodiversity part 5 (DVD)

Climate change. Video – The Truth about Climate Change. Climate change in the tropics - El Niño events, Galapagos, Coral reefs, Tropical mountain ecosystems (student presentations).

Class 10

Mid Term Exam

Class 11

Extinctions and Island Biogeography

Extinction rates in the past, extinctions caused by human activities. Endemic species and extinctions on islands, The Theory of Island Biogeography

Class 12

Problems of small populations

Minimum viable populations, loss of genetic diversity, inbreeding & outbreeding depression, stochastic environmental and demographic factors, extinction vortices.

Class 13

Conserving populations and species

Flagship species, IUCN conservation categories . Monitoring populations, metapopulations. **Conservation *Ex Situ* -** Zoos, botanical gardens, rescue centers, options for confiscated animals.

Class 14

Establishing new populations Introductions, reintroductions and augmentations. Californian Condor, Golden Lion Tamarin, Blue and Yellow macaws, Spectacled bears. Black-footed ferret. Galápagos tortoises, Macaws in Peru. **(student presentations**).

Class 15

Conserving Ecosystems 1 Establishing priorities - Hotspots, key wilderness areas,

global 200 etc.Rapid assessment programs, Indicator species and Endemic Bird AreasGap analysis. Design and management of protected areas – in theory.The SLOSS debate, Wildlife corridors

Class 16

Conserving Ecosystems – 2

Protected areas and people. Protected areas in Latin America. Indigenous people and National Parks. Squatters and *colonos.* Extractive reserves, Biosphere reserves

Class 17

Conservation outside protected areas

Biodiversity and agriculture – Shade-grown coffee and chocolate, ICDPs, Wildlife management. Conservation and sustainable development - International agreements, the roles of government, NGOS, development agencies etc.

Class 18

Restoration Ecology. Restoration of damaged ecosystems – Tropical dry forests, rainforests, cloud-forests, mangroves, Galápagos.

Class 19

Final Exam

Class 20

Student research project presentations