



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Ecologia Generale

2627-2-E3202Q011-E3202Q01101

Aims

The course provides fundamental knowledge on the structure and functioning of ecosystems, in which different species interact with one another and with the surrounding environment. The program ranges from the study of the physical environment (climate, terrestrial and aquatic biomes) to population dynamics, up to community ecology and biogeochemical flows.

Particularly the following educational objectives are planned

****Knowledge and understanding**

Knowledge of the relationships between organisms and environment; quantitative analysis of ecological systems.

****Knowledge and applied understanding**

Knowledge, understanding, and application of the main methodologies useful for studying the ecosystems.

Autonomy of judgment

Through the acquisition of the concepts of ecology, the student will increase his ability in the comprehension of ecosystem functions

****Communication skills**

During the lessons, the student will be invited to take an active part in the lesson by discussing the topics covered in class. This will improve communication skills in public.

****Ability to learn**

The course will improve the student's learning skills in the interpretation of natural phenomena, and ecosystems functions

Contents

Contents:

General Ecology: Energy fluxes and material cycling in the ecosystems. Primary and secondary productivity. Trophic chains. The biogeochemical cycles. Population responses as a function of environmental factors. Exponential and logistic growth of populations. Reproductive strategies. Interactions among populations in the biological communities. The concept of ecological niche. Biodiversity

Detailed program

General ecology:

The multidisciplinary nature of Ecology and the study of the relationships between organisms and environment.

The physical environment: climate, aquatic and terrestrial environment.

The organisms and the environment: ecological genetics, adaptations and natural selection.

Populations: properties and growth of populations; metapopulations.

Populations: life history.

Intraspecific population regulation.

Metapopulation

Species interactions, population dynamics and natural selection.

Interspecific competition, parasitism and mutualism.

Community ecology

Community ecology (structure and dynamics of community, factors influencing the communities)

Ecosystem ecology (ecosystem energetics, decomposition and biogeochemical cycles).

The role of biodiversity in ecosystems. Factors of changes in biodiversity.

Terrestrial ecosystems. Ecoregions. Biomes.

Inland water ecosystems. The seasonal cycle in lakes. The functioning of rivers and the "river continuum" concept.

Marine ecosystems, biotic and abiotic conditions. Coral reef and Kelp prairies. The Mediterranean Sea.

Prerequisites

Basic knowledge of mathematics, chemistry, physics and statistics, as well as of botanical and zoological subjects.

Teaching form

Teaching is structured as Lecture-based Instruction, consisting of 24 two-hour lectures delivered in person.

Textbook and teaching resource

Smith and Smith – *Elementi di Ecologia* - Pearson Editore

Ricklefs R. E., 1999, L'economia della natura, Zanichelli, Bologna;

Odum E. P., Barrett 2006, Fondamenti di Ecologia, Piccin, Padova

slides

Semester

annual

Assessment method

Oral examination

Oral examination at the end of the course. The evaluation criteria will consist in the verification of the student's knowledge of the program presented during the course of general and applied ecology, as well as on the experiences made during the attendance of the laboratory of ecology (the presence is compulsory for at least 75% of the lectures). The exam will aim to ascertain the acquisition of basic skills and to evaluate the understanding of the concepts, the ability to connect the various topics covered. It is underlined that, at the end of the laboratory activities, an oral exam with a vote expressed out of thirty is foreseen. Consequently, the final vote will be calculated using the weighted average of the credits of the three parts of the course (General Ecology, Applied Ecology and Applied Ecology Laboratory).

mark range 18-30/30

Office hours

by arrangement writing an email to antonio.finizio@unimib.it

Sustainable Development Goals

AFFORDABLE AND CLEAN ENERGY | LIFE BELOW WATER | LIFE ON LAND
