

Ecology

Code: 101954
ECTS Credits: 6

Degree	Type	Year	Semester
2500890 Genetics	FB	2	1

Contact

Name: Javier Retana Alumbrosos
Email: Javier.Retana@uab.cat

Use of languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Teachers

Miquel Riba Rovira

External teachers

Rafael Poyatos

Prerequisites

- There are no official prerequisites but it is convenient that the student has taken the optional subjects of Biology and Earth Sciences and the Environment in secondary school.
- It is also recommended that the student has achieved a minimum basic knowledge about Zoology, Botany, Mathematics and Statistics.

Objectives and Contextualisation

The course will focus on important aspects at the levels of organism, population, community and ecosystem, framed in five contexts:

1. Effects of ecological machinery: the environment acts on the life of the organism, modifies the expectations of survival and reproduction (phenotypic selection). The aspects of autoecology, the organism level, are the basic material to understand the distinction between soft and hard selection modes.
2. The different meanings of the concept of environment, which have conditioned our perspective to understand, ecologically and evolutionarily, the relationship between the environment and the organism. The basic attributes of the natural history of organisms will be presented, and summarized in the life strategies of classical K and r, which help to understand the great variation of biological cycles and their important components: duration of life, age of sexual maturity, etc.
3. The biological success that comes with a certain lifestyle, embodied in the concept of Darwinian fitness, can be modified by the accumulation of individuals. The level of complexity of the population is then treated. Vital statistics, summarized by demography, change with the populations size (and their spatial distribution) and prelude the introduction of the idea of soft selection, or selection at the local level.

4. The study of the numerical changes of the populations and their causes (population dynamics) are the basis of the change of allelic frequencies, and the possibility of evolutionary change. The speed of growth of a population is determined by the availability of resources and their types, so that the population growth models will be described. As every organism during its life can be seen as a resource by another organism, there appear several types of binary interactions, and more complex, which are summarized in mutualism, competition, depredation, parasitism and misfortune. The general essence of the type of interaction will be addressed, which requires an approach essentially based on equations, understanding will be carried to an advisable level.

5. The persistence of a species in the long term may also depend, in part, on how the transmission of individual attributes, to the next generations (natural selection,) is carried out, which, in turn, may be conditioned by how the population is configured in the spatial context, either as a population distributed continuously or distributed in a spatial mosaic of local populations of variable size and extension. For this, basic aspects of the ecology of dispersion and migration, and some of the processes that hinder them (fragmentation of habitats and "impermeability" of the ecological matrix) will be considered.

Finally, the reasons for the unequal distribution of the organisms abundances and the number of populations, in a given geographic area, correspond to the level of complexity of the communities. The central idea at this level is diversity, and the main hypotheses to explain the genesis of (high) diversity will be described. A synoptic view of biodiversity and its more social relevance will be given.

Content

1. Introduction to Ecology
2. Ecology and evolution
3. Response of organisms to environmental factors
4. Populations: basic demographic concepts and processes
5. Population dynamics
6. Interactions between species
7. Composition and structure of communities
8. Dynamics of communities - Succession and Disturbance
9. Trophic networks and trophic levels
10. Functioning of ecosystems
11. Global change