

## COURSE DETAIL

### ECOLOGY

**Country**

Italy

**Host Institution**

University of Bologna

**Program(s)**

University of Bologna

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Biological Sciences

**UCEAP Course Number**

142

**UCEAP Course Suffix****UCEAP Official Title**

ECOLOGY

**UCEAP Transcript Title**

ECOLOGY

**UCEAP Quarter Units**

6.00

**UCEAP Semester Units**

4.00

## Course Description

This course is part of the Laurea Magistrale degree program and is intended for advanced level students. Enrollment is by permission of the instructor. The course is aimed at the comprehension of the fundamental principles of how ecological systems work. It focuses on the ecological problems caused by human activities as well. Fundamental and applied aspects of ecology are emphasized. An understanding of the scope of the problems facing us (climate change, unsustainable use of resources, pollution, extinctions, and the erosion of natural biodiversity) and the means to counter and solve these problems depend on a proper grasp of ecological fundamentals. Although the course analyzes all the main types of ecosystems, it works in particular on aquatic ecosystems, covering concepts such as sustainable development, ecosystem services, and environmental monitoring in detail.

The course content is divided as follows:

1. *Introduction*: the cultural roots of ecology, the aims of ecology, the levels of ecological organization, temporal and spatial scales, ecology as a science, ecological methods and tools
2. *Interactions between organisms and their environment*: ecological niche, life cycles and energy acquisition
3. *The populations*: life histories, growth models, life cycles, carrying capacity, the concept of metapopulation, examples of methods of sampling and estimations
4. *Biotic interactions*: competition, predation, parasitism, facilitation and other positive interactions, direct and indirect interactions
5. *Communities and biodiversity*: community structure, ecological successions, distribution, biodiversity and biodiversity indices, factors affecting biodiversity.
6. *Ecosystems and their dynamics*: food chains and food webs, ecosystem functioning, trophic cascades, disturbances and resilience, regime shifts, alternative stable states.
7. *Ecosystem, general concepts*: energy flow, biogeochemical cycles, biomass on earth, decomposition and detritivores, biomes, microclimate and Biotic pump.

8. *Different types of ecosystems*: lentic ecosystems abiotic dynamics, lentic ecosystems communities, terrestrial ecosystems, biomes and microclimate.
9. *River ecosystems*: lotic environments and their catchments: Hydrology, geomorphology and river community.
10. *Natural depuration process (NBSs)*: riparian ecotones, characteristics and function, wetlands, natural phytodepuration systems, other NBSs.
11. *Threats to biological diversity*: habitat degradation and loss, pollution, eutrophication, overexploitation of natural resources, invasive species, climate changes.
12. *Introduction to conservation biology*: the natural capital, ecosystem goods and services
13. *Conservation of populations and ecosystems*: vulnerability and conservation status, reintroductions, restorations, protected areas, spatial planning, current legislations, examples of management of anthropogenic exploitation, success conservation and management stories, monitoring

**Language(s) of Instruction**

English

**Host Institution Course Number**

88369

**Host Institution Course Title**

ECOLOGY

**Host Institution Course Details**

<https://www.unibo.it/en/study/course-units-transferable-skills-moocs/course-uni...>

**Host Institution Campus**

BOLOGNA

**Host Institution Faculty****Host Institution Degree**

LM in LOW CARBON TECHNOLOGIES AND SUSTAINABLE CHEMISTRY

**Host Institution Department**

INDUSTRIAL CHEMISTRY

**Course Last Reviewed**

2025-2026

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