

# Ecology and environmental protection (for the MPM Specialization)

## First Year of Studies, First SEMESTER

**Credit value (ECTS) 6**

### Course category

Domain (Imposed)

### Course holder:

Lecturer Dr. Cristina SLABU

### Discipline objectives (course and practical works)

The aim of the course is to expand the knowledge of Ecology for master's students, focusing on fundamental principles, the structure and dynamics of ecosystems, as well as the development of sustainable strategies for the management and responsible use of natural and anthropogenic ecosystems.

The aim of the practical works is to familiarize students with the specific techniques of ecological studies and to develop the skills to apply theoretical knowledge in practice.

### Contents (syllabus)

Course (chapters / subchapters)
<b>INTRODUCTORY CONCEPTS:</b> Definition, subject of study, history of Ecology as a biological science; branches of Ecology; importance of ecological knowledge in the current context.
<b>ADAPTATION OF ORGANISMS TO THE ENVIRONMENT:</b> Abiotic and biotic factors influencing natural populations; adaptation to the environment; phenotype, genotype, ecotype; limiting factors in species distribution; impact of climate change - effects on ecosystems, adaptation strategies.
<b>POPULATION ECOLOGY:</b> Size and density of natural populations; regulation of population size in nature; population dynamics; demographic strategies in different species; population structure: age structure, sexual structure, spatial distribution; intraspecific social relationships and their effects on distribution; limiting factors for species distribution.
<b>COMMUNITY ECOLOGY:</b> Abundance and diversity of species in communities; ecosystem structure and types of interactions between species; the concept of ecological niche: fundamental niche vs. realized niche; analysis of trophic relationships and interspecific interactions; interspecific interactions: competition, predation, parasitism, amensalism, commensalism, mutualism.
<b>CONSERVATION OF HABITATS AND SPECIES:</b> Conservation status: pressures and threats to protected habitats and species; ecosystem conservation strategies: the role of ecological succession in ecosystem stability; primary and secondary succession: importance and strategies for conserving genetic resources.

**STRATEGIES FOR SUSTAINABLE USE OF RESOURCES:** Principles of sustainable use; management of natural resources and environmental protection; waste management; recycling and reuse of waste as raw materials.

**ENVIRONMENTAL PROTECTION POLICIES AND STRATEGIES:** Environmental strategies and policies; national and international efforts for environmental protection; eco-conditionality and the European Green Deal; harmonizing environmental objectives with economic and social goals; importance and strategies for integrating environmental objectives into economic and social planning.

### Practical applications/ laboratory work

**Management problems:** informing students about the objectives of the discipline, the targeted competencies, the criteria and methods of evaluation; presentation of work safety rules, laboratory equipment, and utensils.

**General methods of ecological sampling and planning of field studies:** Exploring various sampling methods used in Ecology and applying them in planning an ecological study, with a focus on selecting appropriate methods for different types of ecosystems.

**Estimating the size and density of herbaceous plant populations using the quadrat method:** Using the quadrat method to estimate the size and density of herbaceous plant populations, involving random selection of sample areas and data collection in the field. Practical application at V. Adamachi Farm.

**Study of beetle populations adapted to urban environments:** Practical application in Copou Park.

**Analysis of spatial distribution and density and age of oak and hornbeam populations:** Practical application in Bârnova Forest.

**Analysis of litter and organism communities by processing soil samples and applying ecological indices:** Identifying the main groups of invertebrates and applying ecological indices for a qualitative and quantitative characterization of the biocenosis.

**Assessment of anthropogenic impact on natural ecosystems:** Analyzing the impact of introducing foreign species, air quality analysis, and noise pollution assessment. Practical application in the Ciric area.

**Familiarization with the organization of activities in environmental protection institutions:** Visit to the Iași Environmental Protection Agency.

**Final colloquium of knowledge evaluation.**

### References

- Cogălniceanu D., 2012 – Ecologie și protecția mediului. Editura Politehnica Press;
- Jităreanu G. (coordonator), 2020 – Tratat de Agrotehnică: Subcapitolul 12.4.1. Indicatori privind eroziunea solului în UE-28 și cerințele de mediu (p. 879-881); Subcapitolul 14.2.2. Agricultura biologică/ecologică/organică (p.1222-1223); Subcapitolul 14.2.8. Agricultura durabilă (p. 1227-1237). Editura "Ion Ionescu de la Brad", Iași;
- Preda, C., Ruști, D. M., & Cogălniceanu, D., 2020 - Lucrări practice de ecologie generală. Editura Universitară.
- Slabu Cristina, Covașă Mihaela, 2021 – Ecologie și protecția mediului - suport de studiu pentru studenți. Ediția a 2-a. Editura "Ion Ionescu de la Brad", Iași.
- \*\*\* Legislația de mediu – actualizată.
- \*\*\*Consiliul Europei – Pactul verde european. <https://www.consilium.europa.eu/>
- \*\*\*Ministerul Agriculturii- AFIR - Ghidul fermierului privind condiționalitatea (actualizat)

\*\*\*Parlamentul european. Politica de mediu: principii generale și cadrul de bază.  
<https://www.europarl.europa.eu/>

### **Evaluation**

<b>Evaluation forms</b>	<b>Evaluation Methods</b>	<b>Percentage of the final grade</b>
Colloquium	Oral evaluation	60%
Assessment of activity during the semester.	Oral evaluation during the semester, verification tests, laboratory colloquium.	40%

### **Contact**

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