Ecology and Environmental Protection (Agricultural biotechnologies, Ist Year of study, Ist semester)

Credit value (ECTS) 5

Course category
Domain (Imposed)

Course holder:
Lecturer Dr. Cristina SLABU

Objectives (lecture and practical course work)

The aims of this course are
- To provide knowledge of general ecology in order to understand basic principles, structure and function of ecosystems
- To raise the students' awareness for responsible and sustainable use of natural resources and for environmental protection
- To teach the students how to avoid environmental pollution
- To provide theoretical knowledge and practical skills for recognition, analysis, and interpretation ecological problems. Students should gain all the necessary skills to independently provide solutions for environmental problems.

Contents (syllabus)

Course (chapters / subchapters)
I. Ecology - biological science with interdisciplinary approach, with practical and social character: definition, object of study, historic; research methods used in ecology.
II. Organisms and their environments: abiotic and biotic factors; laws of Ecology.
III. Ecosystem: general systems theory; systems classification; characteristics of biological systems; hierarchy of biological systems; characteristics of biological systems; the concept of ecosystem; biotope; biocoenosis; ecosystem structure; ecosystem functions; ecosystem dynamics; types of natural ecosystems.
IV. Anthropogenic impact on the environment: loss of biodiversity and extinctions; soil degradation and reduction of its fertility; environmental pollution, problems and control measures.
V. Genetically modified organisms and their environmental impacts: what are genetically modified organisms and how are they obtained; controversies over the ecological impact of genetically modified organisms.
VI. Sustainable development: ecological principles for management of natural resources and environmental protection; optimal use of natural resources in ecosystems; conservation of genetic resources.
VII. Biotechnologies and sustainable agriculture: genetic erosion of plant resources; the use of biotechnologies in the conservation of agricultural biodiversit, the importance and role of biotechnologies in promoting sustainable agriculture, biodynamic agriculture and organic farming as alternatives to conventional agriculture.
VIII. Aspects regarding the ecological implications of biotechnologies: valorization of plant biomass by bioconversion; biological processing of industrial waste; biological depollution: wastewater treatment, decontamination of polluted soils**.**
IX. Environmental protection: environmental protection in Romania in the context of the global environmental protection**.**

Practical course
1. Management problems: information of students about course aims, the targeted skills, the criteria and methods o evaluation, work safety rules; laboratory equipment and ustensils.
2. Estimation of structural indices of biocenosis in ecological studies: relative abundance, density, frequenc constancy, Shannon-Wiener function, distribution.
3. Structural and functional analysis of an ecosystem. Quantitative analysis of abiotic factors: temperatur humidity, atmospheric pressure, soil characteristics.
4. Ecological adaptations of plants to different environmental conditions (work carried out in Botanical Garden - Iasi).
5. Agricultural Ecosystems: types, structure, function, environmental impact **(**field observations at "V. Adamachi" Research and Experimental Farm**).**
6. Possibilities to identify genetically modified organisms. Visiting the LECOM Laboratory, for the expertise, certification and control of genetically modified organisms and agri-food products (within USAMV Iaşi)
Final colloquium of knowledge evaluation.

References

1. Cogălniceanu D., 2007 – Ecologie şi protecţia mediului – Program postuniversitar de conversie profesională pentru cadrele didactice din mediul rural. www.ecoportal.ro/dan_cogalniceanu/file_download/60/ecologie.pdf
2. Malschi D., 2014 – Biotehnologii si depoluarea sistemelor ecologice. Ed. Bioflux, Cluj-Napoca
3. Maxim A., 2008 – Ecologie generală şi aplicată. Ed. Risoprint, Cluj-Napoca
4. Petre M, 2006 – Biotehnologii ecologice cu aplicaţii în horticultură şi viticultură. Editura Didactică şi Pedagogică, Bucureşti.
5. Petre M, Teodorescu, Al., 2009 – Biotehnologia protecției mediului – vol. I. Ed. CD Press, Bucureşti
6. Slabu Cristina, 2017 – Ecologie (note de curs). USAMV Iaşi
7. Stugren, B., 1994 – Ecologie teoretică, Ed. Sarmis, Cluj
8. Stanciu C., 2006 – Biotehnologii in protecția mediului, Ed. Europlus, Galați
9. Şchiopu D., Vîntu V. (coord.), 2002 - Ecologia şi protecţia mediului. Edit. “Ion Ionescu de la Brad”, Iaşi
10. Toma Liana Doina, 2009 – Ecologie şi protecţia mediului. Ed. PIM; Iaşi
***Protocolul de la Cartagena privind biosecuritatea la Convenţia privind diversitatea biologică
*** Legislația europeană și națională privind OMG

Evaluation

Evaluation forms	Evaluation Methods	Percentage of the final grade
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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