



No. _____ of _____

USAMV form 0102010107 (discipline code)

SUBJECT OUTLINE

1. Information on the programme

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
1.2. Faculty	Agriculture
1.3. Department	III - Environmental and plant protection
1.4. Field of study	Environmental Engineering
1.5. Cycle of study ¹	Bachelor
1.6. Specialization/ Study programme	Engineering and environmental protection in agriculture
1.7. Form of education	Full time

2. Information on the discipline

2.1. Discipline name	Environmental economy						
2.2. Course coordinator	PhD. Lecturer Cristian IEDERAN						
2.3. Seminar/ laboratory/ project coordinator	PhD. Lecturer Cristian IEDERAN						
2.4. Year of study	2.5. Semester	2.6. Evaluation type	continuous	2.7. Discipline status	Content ²		
					Compulsoriness ³	DI	

3. Total estimated time (teaching hours per semester)

3.1. Hours per week - full time programme		out of which: 3.2. lecture	3.3. seminar/ laboratory/ project	2
3.4. Total number of hours in the curriculum		out of which: 3.5. lecture	3.6. seminar/laboratory	28
Distribution of the time allotted				hours
3.4.1. Study based on books, textbooks, bibliography and notes				10
3.4.2. Additional documentation in the library, electronic platforms and field experiences				4
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays				4
3.4.4. Tutorials				2
3.4.5. Examinations				2
3.4.6. Other activities				
3.7. Total hours of individual study	22			
3.8. Total hours per semester	78			
3.9. Number of credits ⁴	3			

4. Prerequisites (if applicable)

4.1. curriculum-related	General ecology, General economy
4.2. skills-related	The student must have general knowledge of environmental issues and economic efficiency.

5. Conditions (if applicable)

5.1. for the course	Room equipped with computer, video projector and blackboard. The course is interactive, students can ask questions about the content of the exhibition. The university discipline requires the observance of the start and end time of the course.
5.2. for the seminar/ laboratory/ project	At seminars it is compulsory to go through the teaching material that contains each topic. Academic discipline is required throughout the duration of the seminars.

6. Cumulated specific competences

Professional competences	C1 Explaining the mechanisms of processes and effects of anthropic or natural origin that determine and influence the pollution of the environment. Description and application of the concepts, theories and practical methods for determining the quality of the environment. Applying basic scientific knowledge in defining and explaining concepts related to environmental protection issues in agriculture. Choosing the principles and establishing the appropriate basic methods for solving problems
Transversal competences	CT3 Objective self-assessment of the need for continuous training in order to constantly adapt and respond to the demands of economic development; the use of information and communication techniques and, at least, of a language of international circulation

7. Discipline objectives (based on the cumulated specific competences)

7.1. General objective	The economy of the environment is a discipline of fundamental training for the specialists in consultancy and expertise in agriculture, being defined worldwide, as a discipline located on the border between ecology and the economic sciences. The environmental economy aims to train specialists in agricultural consultancy, focusing on policies adopted at the level of international bodies and the impact of these policies at global, regional and local level. It studies the natural resources, as well as their use in keeping with the ecological balance in nature. The economic evaluation of the environmental problems becomes a mandatory condition for arguing the allocations of the reimbursable financial means and free of charge for the purpose of modernizing the production processes, the provision of services and performing the sustainable development works.
7.2. Specific objectives	The course transmits to the students specific notions and information for tackling the environmental problem as a public good and a system based on self-reproduction, which is in close interdependence with the economic environment. The issue of the course is focused on the study of the interdependence between natural capital (governed by biological laws) and the economic environment (dominated by economic laws). The economy of the environment aims to prepare the students in substantiating the common perspective of two components through concepts such as: rational management of resources, damages and costs related to the environment, micro and macro economic repercussions. The course follows the circular flow of matter, starting with its condition of primary resource taken from the environment and until its discharge in it, in the form of residue, passing through all the phases of production, accumulation of capital, consumption and economic management. Finally, the course aims to substantiate the transition from the stationary model of development to the model of sustainable development by elaborating the techniques for evaluating in monetary terms the phenomena related to the evolution of the environment and using analysis methods as a decision support.

8. Content

8.1. COURSE Number of hours -28	Teaching methods	Observation
	Lecture	1 lecture = 2 hours
INTRODUCTION. Environmental economy - general considerations. Definitions and concepts. Matter, time and space, energy generators and living environment. Energy flow, substance and information in ecosystems. Ecosystems production capacity. The economy of the environment between excessive economism and conservative environmentalism	Lecture	1 lecture
NATURAL RESOURCES USED, QUALITY AND LIMITING FACTORS. Ability to support the environment. Non-renewable resources - minerals and fossil fuels. Renewable resources - water, air, soil, flora, wildlife. Permanent resources - solar, wind, geothermal and wave energy. Agroecosystems: biological factor and technological factor of agricultural production. Social-economic factors. Economic and environmental	Lecture	1 lecture

protection priorities or coexistence between contemporary human interests and the integrity of nature.		
THE STATE OF THE ENVIRONMENT: TRENDS, THREATS AND OPPORTUNITIES. Addressing the ecological aspects through the prism of the economic estimation. Protecting the environment in running companies. Estimating the economic value of biodiversity and other environmental goods. The correlation between economic growth and the environment. Ecological management.	Lecture	1 lecture
FAVORABILITY AND PHENOMENES OF DEGRADATION OF AGRICULTURAL LANDS IN ROMANIA. Deterioration of soil properties through processes: physical, chemical, biological and complex. Destruction of soil through processes of dislocation, cover and loss of land. The imbalances of agroecosystems. Pollution, degradation, desertification, erosion, compaction. Installing and maintaining ecological balance in agroecosystems.	Lecture	1 lecture
PRODUCTION AND PRODUCTIVITY IN VARIOUS AGRICULTURAL SYSTEMS. Agroecosystems and agricultural areas in Romania. Land fund - quality, limitations and degradation factors. Agriculture systems. Conventional agriculture. Agriculture with low inputs. Subsistence agriculture. Sustainable agriculture. Organic farming. Precision agriculture.	Lecture	1 lecture
ECONOMY AND ENVIRONMENT. Two ecological revolutions. The historical evolution of the environmental economy. The circular and sustainable economy. Recordings of economic growth and environmental impact.	Lecture	1 lecture
ECONOMIC AND ENVIRONMENTAL POLICIES. External costs and market failures. Internality of externality. Optimal externality. The bearable level of pollution. Political and economic instruments. Elimination of subsidies. Ecotaxes and ecorealities. Voluntary or negotiated agreements. The Kyoto Protocol, 1997; The Johannesburg Summit, 2002.	Lecture	1 lecture
CREATING AN EFFECTIVE ENVIRONMENTAL POLICY. Determining the costs of degraded resources and the benefits of environmental policies. Currency methodologies. Promoting sustainable development. Steps to sustainable development. International environmental law from concept to Stockholm Summit, 1972 to taxation in Rio de Janeiro, 1992.	Lecture	1 lecture
INSTRUMENTS OF ENVIRONMENTAL POLICIES. Setting environmental goals and targets. Criteria for evaluating environmental policy instruments. The list of options of environmental policy instruments (direct, normative, indirect, economic; voluntary policy instruments).	Lecture	1 lecture
INSTRUMENTS FOR PROMOTING ENVIRONMENTAL POLICIES. "Direct" or "command and control" approaches. "Indirect" or "market-based" approaches (taxes, grants, deposit funds, market creation, environmental policies through financial levers, "Green Budgeting"). Comparison between "direct" and "indirect" type approaches.	Lecture	1 lecture
APPLICATIONS OF ENVIRONMENTAL POLICY INSTRUMENTS IN EU and Central and Eastern Europe. Brief history of applications in Romania. Sustainable economic growth in Romania.	Lecture	1 lecture
ENVIRONMENTAL POLICIES OF THE MICROECONOMY. External and internal factors that influence the development of the environmental market. Radical changes in managerial behavior. Environmental aspects of competitiveness. Challenges of the near future for Romanian and Central and Eastern European businesses. Strategies, plans and action programs.	Lecture	1 lecture

PRODUCTION OF ECONOMIC HARVEST. Ecotechnics and ecotechnologies. Soil management. Energy management. Agricultural management. Ecological management. Technical progress in agriculture. Implementation and implementation of ecological reconstruction programs.		1 lecture
THE COMPLEX ENVIRONMENT SYSTEM - AGRICULTURE - ECONOMY. Intermediate technologies. Economical technologies. Naturalistic technologies. Alternative technologies. Adapted technologies. Energy-productive and ecological parameters.	Lecture	1 lecture

8.2. PRACTICAL WORKS Number of hours - 28	Teaching methods	seminar
	exemplification	1 seminar (2 hours/seminar)
Evaluation of the environmental government policy in Romania according to the environmental economy criteria (competitive group discussions). Quasi-fiscal and budgetary transfers in favor of agriculture - comparative analysis.	exemplification	1 seminar
Evaluation of the governmental environmental policy in Romania as a factor contributing to the development of the environmental market and to the industrial restructuring on ecological basis (competitive group discussions).	exemplification	1 seminar
Evaluation of the environmental costs of drought phenomena. Analysis of hurricane amplification and flooding. Research, system analysis, techniques and models.	exemplification	1 seminar
Desertification analysis. Pálfi - PAI aridity index, Domuța - ICD climatic index, De Martonne - And aridity index Lang - L, Lang - L aridity index, Meyer - M unsaturation coefficient, Standardized precipitation index - SPI.	exemplification	1 seminar
Determination of soil resilience. Determination of soil resistance to penetration with Fieldscout SC 900 Soil Spectrum digital penetrometer. Determination of physical soil degradation. Destruction. Crusting. Primary and secondary compaction. Agrochemical degradation. Biological degradation.	exemplification	1 seminar
Determination of soil permeability for water with digital infiltrometer with Turf Tec sonar alarm. Determination of the infiltration with the Munz - Faure - Laine permeameter. Determination of humidity (gravimetric method, Delmhorst KS-D1 gypsum electrometric humidometer, Jet filament tensile meter ARL 2725, Turf Tec sonic alarm digital infiltrometer, Aquaterr Temp 300 digital thermohygrometer).	exemplification	1 seminar
Measuring the gas-atmospheric function of the soil and quantifying the impact of different uses. Measurement of CO2 emissions - Gradient method with state-of-the-art GMM220 Vaisala sensors. Dependence of pollutant emissions on GDP / inhabitant - comparative analysis.	exemplification	1 seminar
Evaluation of the costs of environmental protection actions and identification of their sources of support. Development of long-term programs correlated at national and international level regarding the protection of the environment.	exemplification	1 seminar
Measuring the capacity of assimilating the environment. The relationship between the volume of production and the level of pollution.	exemplification	1 seminar
The environmental and economic functions of fixed assets. Quantitative - flow of goods, depletion of stocks. Qualitative - flow of services - degradation of fixed assets. Qualitative - waste stream, environmental degradation.	exemplification	1 seminar

Environmental costs. Costs generated. Costs incurred. Repercussion costs. Technical assistance in the field of economics and environmental statistics for databases, reports and mathematical modeling.	exemplification	1 seminar
Cost benefit analysis. Costs (direct, externalities - market price, externalities - substitute price). Benefits (direct, externalities - market price, externalities - substitute price). Prevention expenditure analysis. Analysis of relocation costs. Externality assessment using "shadow" prices.	exemplification	1 seminar
Establishing sustainable agricultural eco-technologies, technology transfer and integration into the European platform: sustainable resource management.	exemplification	1 seminar
Knowledge verification / Related support / Case study debates	testing	1 seminar
<ol style="list-style-type: none"> 1. Arion F., 2012. <i>Economia mediului</i>. Suport de curs. 2. Rusu Teodor, Gheres Marinela, 2008. <i>Economia mediului</i>. Editura Risoprint Cluj-Napoca 3. Marinela Geres, T.Rusu, M.I.Gheres, 2003. <i>Economia mediului și protecția agroecosistemelor</i>. Editura Risoprint, Cluj-Napoca. 4. Guș, P., T.Rusu, 2005. <i>Dezvoltarea durabilă a agriculturii</i>. Editura Risoprint Cluj-Napoca 		
<i>Optional bibliography:</i> <ol style="list-style-type: none"> 1. David W. et al. Baltimore, 2001, <i>Economics of Natural Resources and the Environment</i>, The Johns Hopkins University Press. 2. Rusu, T., 2005. <i>Ecotehnica</i>. Editura Risoprint Cluj-Napoca. 3. ICPA București. <i>Cod de bune practici agricole</i>. 2003. Vol. I, II, III 		

9. Corroborating the discipline content with the expectations of the epistemic community representatives, of the professional associations and of the relevant employers in the corresponding field

The content of the discipline is consistent with what is done in other university centers in the country and abroad. To better adapt to the demands of the labor market of the content of the discipline, meetings were held with representatives of the business environment.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation type	10.3. Percentage of the final grade
10.4. Course	- the knowledge by the students of the complex interaction environment - economy through the unitary approach of the activities from general to private,	continuous	70 %
10.5. Seminar/Laboratory	- knowledge of environmental actions at national, county, zonal, communal and local (urban and rural) levels and economic and social impact. - knowledge of the costs of degraded resources and the benefits of environmental policies		30%
10.6. Minimum performance standards			
Mastery of scientific information transmitted through lectures and practical papers at an acceptable level. Obtaining the passing grade for the ongoing checks is a condition of promotability.			

- 1 Cycle of studies - choose one of the three options: Bachelor/Master/Ph.D.
- 2 according to the educational plan
- 3 Discipline status (compulsoriness) - choose one of the options – **DI** (compulsory discipline) **DO** (optional discipline) **DFac** (facultative discipline).
- 4 One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

Filled in on
04.09.2019

Course coordinator
PhD. Lecturer Cristian IEDERAN

Laboratory work/seminar coordinator
PhD. Lecturer Cristian IEDERAN



Approved by the
department on
05.09.2019

Head of the Department
Prof. dr. Ioan OROIAN

