



No. _____ of _____

USAMV form 0107040101

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	Environmental and Plant Protection
1.4. Field of study	Environmental Engineering
1.5. Cycle of study ¹	Bachelor / Master
1.6. Specialization/ Study programme	Environmental Engineering
1.7. Form of education	Full time

2. Information on the discipline

2.1. Discipline name	Ecological reconstruction of the soil 1							
2.2. Course coordinator	Prof.PhD. Laura Paulette							
2.3. Seminar/ laboratory/ project coordinator	Lecturer PhD IOan Brasovean							
2.4. Year of study	IV	2.5. Semester	1	2.6. Evaluation type	Summative	2.7. Discipline status	Content ²	DS
							Compulsoriness ³	DI

3. Total estimated time (teaching hours per semester)

3.1. Hours per week – full time programme	4	out of which: 3.2. lecture	2	3.3. seminar/ laboratory/ project	2
3.4. Total number of hours in the curriculum	56	out of which: 3.5. lecture	28	3.6. seminar/laboratory	28
Distribution of the time allotted					hours
3.4.1. Study based on books, textbooks, bibliography and notes					15
3.4.2. Additional documentation in the library, electronic platforms and field experiences					10
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					10
3.4.4. Tutorials					5
3.4.5. Examinations					4
3.4.6. Other activities					
3.7. Total hours of individual study	44				
3.8. Total hours per semester	100				
3.9. Number of credits ⁴	4				

4. Prerequisites (if applicable)

4.1. curriculum-related	Pedology, Ecology
4.2. skills-related	Knowledge regarding the components and functions of the edaphic system in degraded conditions

5. Conditions (if applicable)

5.1. for the course	Teaching is interactive, illustrated with photos and drawings in Power Point. It aims a direct response of the information presented (question and answer) by both, teacher and students. Academic discipline enforce the start time and end of the course. It is not allowing any other activities during the lecture, mobile phones are closed.
5.2. for the seminar/ laboratory/ project	Physical and chemical analysis of soil are performed during the practical works in the laboratory and on the field soil profile morphology is analyzed.

	Under the direct supervision of practical framework, each student will conduct an individual work with laboratory materials provided and described in the guide for practical work. Academic discipline is required throughout the duration of the works.
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6. Cumulated specific competences

Professional competences	<p>The rational management and exploitation of edaphic resources.</p> <p>Providing services regarding ecological reconstruction measures according to the causes of agricultural land degradation.</p> <p>Conducting specialized studies and expertise and providing consultancy in ecological reconstruction</p> <p>Taking soil samples, carrying out analyses in laboratories and specialized equipment and interpreting them.</p> <p>Teaching and research activities in the field of ecological reconstruction</p>
Transversal competences	<p>Demonstrate practical skills in identifying degradation factors / processes</p> <p>Be able to identify methods of controlling and combating physical and chemical degradation</p> <p>To be able to organize the development of the specific activities of the remediation programs.</p> <p>To demonstrate logic and organization in the evaluation of the degradations induced by the activities carried out through agriculture</p> <p>To participate in research activities in the field.</p>

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

7.1. General objective	Acquiring knowledge on ecological rehabilitation of agricultural land.
7.2. Specific objectives	<p>Acquiring knowledge about the factors involved in agricultural land degradation</p> <p>Be able to analyse environmental and edaphic components affected by degradation</p> <p>To apply the remediation programs specific to the type of degradation.</p>

8. Content

8.1. COURSE Number of hours –28	Teaching methods	Observation
The concept of ecological reconstruction. Ecological reconstruction, general and specific notions of agriculture. Agriculture in sustainable development. Agricultural systems	Lecture	1 lecture = 2 hours
Renewable natural resources. Soil - renewable resource. Basic soil functions. Soil resources by the purpose of their use. Farmland. Physical-geographical characterization of soils in Romania. Soil quality status	Lecture	2 lectures
Degradation of agricultural land. Classification of degradation processes Soil degradation through agriculture / concepts and definitions	Lecture	1 lecture
Degradation of agricultural land through soil works Destruction of soil. Soil compaction. Modification of water regime and biological activity.	Lecture	1 lecture
Erosion degradation. Causes and effects of erosion. Preventive anti-erosion measures for rehabilitation and ecological reconstruction	Lecture	2 lectures
Degradation by application of pesticides. Definition and classification of pesticides. Effects of pesticides on ecosystems. Alternatives to reducing pesticide use	Lecture	1 lecture
Degradation by application of fertilizers. Rational fertilization. Principles and concepts. Restrictions and precautions when applying chemical and organic fertilizers. Nitrates. Areas vulnerable and potentially vulnerable to nitrates. Measures for ecological reconstruction of degraded land through the use of fertilizers	Lecture	2 lectures
Degradation by applying solid and liquid manure and wastewater. Agricultural waste. Restrictions and precautions for the application and storage of agricultural waste as measures to prevent the degradation of agricultural land. Modification of soil organic matter	Lecture	1 lecture
Degradation by irrational grazing. Technical measures and actions to reconstruct the degraded pastures.	Lecture	1 lecture
Deforestation. The current state of deforestation in Romania. Land degradation processes due to deforestation. Measures for reconstruction of lands degraded by deforestation.	Lecture	1 lecture
Irrational irrigation. Processes generated by irrational irrigation. Changes in soil properties in improvement systems	Lecture	1 lecture
Soil monitoring. Integrated soil monitoring. Concept, structure and scope. Monitoring criteria	Lecture	1 lecture

8.2. PRACTICAL WORKS Number of hours –	Teaching methods	Observation
Introduction. Glossary used in ecological reconstruction. Definitions Methods of ensuring soil quality. Soil conservation. Soil quality indicators. Methods of determination and evaluation. Processes of physical soil degradation. Preventing and combating agricultural land degradation due to soil works Soil erosion. Evaluation and monitoring of soil losses. Preventive anti-erosion measures for the rehabilitation and ecological reconstruction of the eroded lands. Processes of chemical soil degradation. Quantification of soil degradation produced by unreasonable fertilization and the action of pesticides. Methods to reduce pesticide consumption. Nitrates: evaluation methods and criteria for establishing vulnerable and potentially vulnerable areas for nitrates. Acidification of soil. Methods to correct soil reaction. Management of organic residues from livestock farms. Methods to combat soil degradation produced by applying solid and liquid manure Methods to combat soil degradation produced by wastewater and agricultural waste Methods of soil organic matter conservation. Ecological reconstruction of deforested land. Study of the changes induced by the irrational irrigation. Improvement techniques of the lands degraded by irrational irrigation. Soil quality monitoring indicators.	Presentation	1 lab work (2 hours/work)
	Study case	1 lab work
	Study case	1 lab work
	Study case	1 lab work
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	Study case	1 lab work
Compulsory bibliography: <ol style="list-style-type: none"> 1. Paulette Laura, 2015- <i>Reconstrucția ecologică a solurilor 1. Terenurile agricole</i>. Editura BioFlux, Cluj Napoca, ISBN 978-606-8191-86-7, ISBN 978-606-8191-88-1, 196 p. 2. ICPA, 2006, <i>Codul de bune practici agricole</i>, București. 3. Florea N., Munteanu I. – <i>Sistemul Român de Taxonomie a Solurilor (SRTS)</i>, București 2003 4. Ordin MMGA-MAPDR nr. 241/196 din 2005 – <i>Lista localităților pe județe unde există surse de nitrați din activități agricole</i> 5. Ordin MMGA-MAPDR nr. 242/197 din 2005 – <i>Program de organizare a Sistemului național de monitoring integrat al solului</i> 6. Ordin MMGA-MAPDR nr. 296/216 din 2005 – <i>program cadru de acțiune tehnic pentru elaborarea programului de acțiune în zone vulnerabile la poluarea cu nitrați din surse agricole</i> 7. Ordin MAPDR nr. 302 din 2005 privind <i>regitrul fermelor</i> 		
Optional bibliography: <ol style="list-style-type: none"> 1. CHIRIȚĂ C-TIN, 1974 – <i>Ecopedologie cu baze de pedologie generală</i>. Ed Ceres, București. 2. ICPA, 1986 - <i>Metodologia de elaborare a studiilor pedologice</i>. București. 3. Lăcătușu R. și colab. – <i>Impactul surselor de poluare din siturile horticoale periurbane și urbane asupra calității mediului înconjurător și a produselor legumicole</i>; Ed Est Falia București, 2004 4. Popescu C., Bucur D. – <i>Valorificarea unor terenuri agricole expuse poluării și degradării</i>; Ed. Ion Ionescu de la Brad Iași, 2004. 5. DEFRA, Departament for Environment, Food & Rural Affairs – <i>Manure planning în NVZs – England</i>, 2004. 		

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 similar to that of the disciplines within the faculties with environmental profile of the universities of the country. The content is supplemented annually, based on the new information published in the field and the debates with farmers, practitioners and specialists.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation type	10.3. Percentage of the final grade
10.4. Course	Answer to the quizzes	summative(E)	70%
10.5. Seminar/Laboratory	Answer to the quizzes	test	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 on-the-spot checks is a condition for participation in the exam.

- 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
Prof. PhD Laura Paulette

Laboratory work/seminar coordinator
Lecturer PhD Ioan Braşovean

Approved by the
department on
05.09.2019

Head of the Department
Prof. PhD Ioan Oroian