



No. \_\_\_\_\_ of \_\_\_\_\_ 2019

USAMV form 0107020104

## SUBJECT OUTLINE

## 1. Information on the programme

1.1. Higher Education Institution	University of Agricultural Sciences and Veterinary Medicine, 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 <sup>1</sup>	Bachelor
1.6. Specialization/ Study programme	Environmental Engineering
1.7. Form of education	Full time

## 2. Information on the discipline

2.1. Discipline name	GENERAL ECOLOGY I							
2.2. Course coordinator	Professor Ph.D. Aurel MAXIM							
2.3. Seminar/ laboratory/ project coordinator	Professor Ph.D. Aurel MAXIM							
2.4. Year of study	II	2.5. Semester	I	2.6. Evaluation type	Sumative	2.7. Discipline status	Content <sup>2</sup>	DD
							Compulsoriness <sup>3</sup>	D!

## 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
<b>Distribution of the time allotted</b>					hours
3.4.1. Study based on books, textbooks, bibliography and notes					24
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					10
3.4.5. Examinations					10
3.4.6. Other activities					
3.7. Total hours of individual study	64				
3.8. Total hours per semester	120				
3.9. Number of credits <sup>4</sup>	4				

## 4. Prerequisites (if applicable)

4.1. curriculum-related	Botany, Zoology, Agrometeorology
4.2. skills-related	Students must have knowledge of plant morphology and systematic

## 5. Conditions (if applicable)

5.1. for the course	The course is interactive, students can ask questions regarding the content of the statement. Academic discipline enforces the start time and the end of the course. Are not allowed any kind of activities during the lecture, mobile phones are closed.
5.2. for the seminar/ laboratory/ project	At practical work the consultation of the practical mentor is mandatory, each student will develop an individual activity with laboratory material made available and described in the guide for practical work. Academic discipline is imposed throughout the tutorial.



## 6. Specific competencies gained

Professional competencies	<p>To know the specific discipline language of Ecology.</p> <p>To understand the functioning of biological systems.</p> <p>To acquire the computation of parameters that characterizes the population dynamics.</p> <p>To master the calculation of indices that define the relationships between species of biocenosis group.</p> <p>To know the main abiotic and biotic environmental factors and their role in ecosystem functioning.</p> <p>To understand the spatial structure, trophic and temporal biochemical ecosystems.</p>
Transversal competences	<p>Autonomy and assuming responsibility.</p> <p>Application of efficient work techniques in multidisciplinary team.</p> <p>Personal development and management of time and activities to carry out work tasks during courses and practical work.</p>

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

7.1. General objective	To acquire knowledge of the structure and functions of ecosystems
7.2. Specific objectives	<p>To know the characteristics of abiotic factors and their influence on the biotic component of the ecosystem.</p> <p>To acquire indexes of population and biocenosis.</p> <p>To know the structure of ecosystems.</p>

## 8. Content

8.1.COURSE	Teaching methods	Observation
<p><b>Number of hours – 28</b></p> <p><b>Chapter 1. Purpose and history of ecology</b></p> <p><b>Part I</b></p> <p><b>GENERAL ECOLOGY CONCEPTS</b></p> <p><b>Chapter 2. Biological systems</b></p> <p><b>Chapter 3. Environmental factors</b></p> <p>3.1. Abiotic factors</p> <p>3.1.1. Climatic factors</p> <p>3.1.2. Fire</p> <p>3.1.3. Geographical factors</p> <p>3.1.4. Mechanical factors</p> <p>3.1.5. Edaphic factors</p> <p>3.1.6. The interaction of abiotic factors</p> <p>3.1.7. Laws of ecological factors action</p> <p>3.1.8. The importance of climatic factors for combating pests in plants</p> <p>3.2. Biotic factors</p> <p>3.2.1. Homologies relations</p> <p>3.2.2. Heterotopias relations</p> <p>3.2.3 Complex relations</p> <p><b>Chapter 4. Structure of the ecosystem</b></p> <p>4.1. Spatial structure of the ecosystems</p> <p>4.2. Trophic structure of the ecosystem</p> <p>4.3. Biochemical structure of the ecosystems</p> <p>4.4. Temporal structure of the ecosystems</p> <p>4.4.1. Ecosystem dynamics</p> <p>4.4.2. The development of the ecosystem (ecological series)</p>	<p>Lectures</p> <p>Lectures</p> <p>Lectures</p> <p>Lectures</p>	<p>1 lecture</p> <p>1 lecture</p> <p>3 lectures</p> <p>3 lectures</p> <p>6 lectures</p>



<p><b>8.2.PRACTICAL WORK</b>  <b>Number of hours – 28</b>  Systemic analysis - working methodology in modern ecology  Study of the adaptations of organisms to the limited action of light, temperature and water - activity in the field  Mapping the plant systematic as a working method in studies of flora and vegetation - way of achieving and interpretation  Methodologies used in ecology studies of soil:</p> <ul style="list-style-type: none"> <li>- the determination in the field of some physical and chemical parameters of soil</li> <li>- a sampling of soil in order to study micro-organisms, microarthropods, lumbricids and other edaphic animals – activity in the field</li> <li>- estimation of soil bacteria through the most probable number method</li> <li>- the separation of microarthropods by using Berlese-Tullgren method</li> <li>- identifying the main groups of microarthropods present in soil samples</li> </ul> <p>Methodologies used in limnology studies:</p> <ul style="list-style-type: none"> <li>- the determination in the field of some physical and chemical parameters of water – activity in the field</li> <li>- the methodology of sampling the plankton – activity in the field</li> <li>- the methodology of sampling the benthos – activity in the field</li> <li>- identifying groups of planktonic and benthic organisms</li> </ul> <p>Estimation of relative and absolute density of population  Biological diversity analysis of biocoenoses by using Simpson and Shannon-Wiener indices: calculation and interpretation  Trophic spectrum analysis of a community diversity and ecological evaluation of the main groups involved in decomposition  Verification of knowledge</p>	<p>Laboratory activity</p> <p>Fieldwork</p> <p>Laboratory activity and fieldwork</p> <p>Laboratory activity and fieldwork</p> <p>Fieldwork</p> <p>Laboratory activity</p> <p>Laboratory activity</p> <p>Laboratory activity</p>	<p>1 laboratory session</p> <p>1 laboratory session</p> <p>2 laboratory sessions</p> <p>4 laboratory sessions</p> <p>2 laboratory sessions</p> <p>1 laboratory session</p> <p>1 laboratory session</p> <p>1 laboratory session</p> <p>1 laboratory session</p>
<p><b>Compulsory bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Botnariuc N., Vădineanu A, <i>Ecologie, Ed. Did. Si Ped., Bucuresti, 1982</i></li> <li>2. Fițiu A., <i>Ecologie și Protecția Mediului, Ed. Academicpres, 2002</i></li> <li>3. Maxim, A., <i>Ecologie 3ractic și aplicată, Editura Risoprint Cluj-Napoca, 2008</i></li> <li>4. Muntean L., Stirban M, <i>Ecologie și Protecția Mediului, Editura Dacia, 1995</i></li> <li>5. Șandor, M., Maxim, A., <i>Ecologie. Lucrări practice. Editura AcademicPres, Cluj-Napoca, 2009</i></li> <li>6. Șandor M., <i>Ecologie aplicată. Metode și principii. Editura Digital Data Cluj, 2012</i></li> </ol>		
<p><b>Optional bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Fabian A., <i>Onaca Rodica, Ecologie aplicată, Ed. Sarmis, Cluj Napoca, 1999</i></li> <li>2. Jorgensen, S. E., <i>Integration of Ecosystem Theories: A Pattern, Kluwer Academic Publishers, 1992</i></li> <li>3. Șchiopu, D., Vântu, V., <i>Ecologie și protecția mediului, Ed. „Ion Ionescu de la Brad”, Iași, 2002</i></li> <li>4. Toncea I., <i>Ghid 3ractice de agricultură ecologică, Ed. Academicpres, 2002</i></li> </ol>		



**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**

In order to identify ways of modernization and continuous improvement of teaching and course content with the current issues and practical problems, teachers and students participate in an annual environmental symposium of University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca in collaboration with the Romanian Waters and Protection Agency Environment Cluj where they debate current environmental issues.

**10. Evaluation**

Type of activity	10.1. Evaluation criteria	10.2. Evaluation type	10.3. Percentage of the final grade
<b>10.4. Course</b>	Biological systems Biotic and abiotic environmental factors The structure ecosystems	Oral exam	70%
<b>10.5. Seminar/Laboratory</b>	Mapping the plant systematic- way of achieving and interpretation Methodologies used in ecology studies of soil Methodologies used in limnology studies Trophic spectrum analysis of a biocenosis	Verification of knowledge (4)	30%
<b>10.6. Minimum performance standards</b> Mastering scientific information provided during lectures and practical work at an acceptable level. Obtain the pass mark in continuous assessment is a graduation requirement.			

- 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) DFae (facultative discipline).
- 4 One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

Filled in on  
4/9/2019

Course coordinator  
Professor Ph.D. Aurel MAXIM

Laboratory work/seminar coordinator  
Professor Ph.D. Aurel MAXIM

Approved by the  
department on  
5/9/2019

Head of the Department  
Professor Ph.D. Ioan OROIAN