



No.....of.....2019

Form code USAMV 0102010108

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 | Plant culture |
| 1.4. Field of study | Agronomy |
| 1.5. Cycle of study ¹ | Bachelor |
| 1.6. Specialization/ Study programme | Montanology |
| 1.7. Form of education | Full time |

2. Characteristics of the course

| | | | | | | | | |
|---|-----------------------------|---------------|----|----------------------|------------|------------------------|-----------------------------|----|
| 2.1. Discipline name | AGROECOLOGY | | | | | | | |
| 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 | I | 2.5. Semester | II | 2.6. Evaluation type | continuous | 2.7. Discipline status | Content ² | DF |
| | | | | | | | Compulsoriness ³ | DI |

3. Total estimated time (teaching hours per semester)

| | | | | | |
|---|-----|----------------------------|----|-----------------------------------|-------|
| 3.1. Hours per week – full time programme | 3 | out of which: 3.2. lecture | 2 | 3.3. seminar/ laboratory/ project | 1 |
| 3.4. Total number of hours in the curriculum | 42 | out of which: 3.5. lecture | 28 | 3.6. seminar/laboratory | 14 |
| Distribution of the time allotted | | | | | hours |
| 3.4.1. Study based on books, textbooks, bibliography and notes | | | | | 20 |
| 3.4.2. Additional documentation in the library, electronic platforms and field experiences | | | | | 20 |
| 3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays | | | | | 20 |
| 3.4.4. Tutorials | | | | | 14 |
| 3.4.5. Examinations | | | | | 4 |
| 3.4.6. Other activities | | | | | |
| 3.7. Total hours of individual study | 78 | | | | |
| 3.8. Total hours per semester | 120 | | | | |
| 3.9. Number of credits ⁴ | 4 | | | | |

4. Prerequisites (if applicable)

| | |
|-------------------------|-------------------------------------|
| 4.1. curriculum-related | Botany, Biophysics, Agrometeorology |
| 4.2. skills-related | |

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 time to start and end of the course. Are not allowed any other 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. Cumulated specific competences

| | |
|---------------------------|--|
| Professional competencies | <p>To know the specific language discipline of Agroecology.</p> <p>To understand the functioning of biological systems.</p> <p>To know the main abiotic and biotic environmental factors and their role in ecosystem functioning.</p> <p>To understand the structure and functions of ecosystems.</p> <p>To know the characteristics and functioning of agroecosystems.</p> <p>To be able to describe the main farming systems.</p> <p>To understand the impact of human activities on air, water, and soil and the main remedies.</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 regarding agroecosystems. |
| 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 that characterize the population and biocenosis.</p> <p>To know the structure and functions of ecosystems.</p> <p>To know the characteristics of the agroecosystems.</p> <p>To acquire the characteristics of agriculture systems.</p> <p>To be aware of the damage and environmental protection problems.</p> |

8. Content

| 8.1. COURSE | Teaching methods | Observation |
|--|---|--|
| <p>Number of hours – 28</p> <p>Chapter 1. PURPOSE AND HISTORY OF ECOLOGY</p> <p>Chapter 2. BIOLOGICAL SYSTEMS</p> <p>Chapter 3. ENVIRONMENTAL FACTORS</p> <p>3.1. Abiotic factors</p> <p>3.2. Biotic factors</p> <p>Chapter 4. STRUCTURE OF THE ECOSYSTEMS</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>Chapter 5. ECOSYSTEM FUNCTIONS</p> <p>5.1. Energy function of ecosystems</p> <p>5.2. The movement function in ecosystems</p> <p>5.3. Self-regulating function</p> <p>Chapter 6. GENERAL TERMS OF AGROECOSYSTEMS</p> <p>6.1. Definition, importance, and historical</p> <p>6.2. Origin and evolution of agricultural systems</p> <p>6.3. Characteristics of farming systems</p> <p>Chapter 7. CLASSIFICATION OF POWER ENGINEERING IN AGROECOSYSTEMS</p> <p>7.1. Extensive agroecosystems</p> <p>7.2. Intensive agroecosystems</p> <p>7.3. Industrialized agroecosystems</p> | <p>Lecture</p> <p>Lecture</p> <p>Lecture</p> <p>Lecture</p> | <p>1 lecture</p> <p>2 lectures</p> <p>2 lectures</p> <p>3 lectures</p> |



| | | |
|---|--|--|
| <p>Chapter 8. AGROECOSYSTEMS AND THE NOURISHMENT OF MANKIND Chapter 9. FARMING SYSTEMS 9.1. Traditional farming systems 9.2. Modern agriculture systems 9.2.1. Industrialized agriculture systems 9.2.2. Sustainable agriculture systems Chapter 10. ENVIRONMENTAL PROTECTION IN AGRICULTURE –THE NATIONAL PLAN FOR RURAL DEVELOPMENT 2014-2020 Chapter 11. ENVIRONMENTAL DAMAGE AND PROTECTION 11.1. Definition and classification of pollution 11.2. Air pollution 11.3. Water pollution 11.4. Soil pollution 11.5. Agricultural diversity conservation 11.6. The risks of genetically modified organisms</p> | <p>Lecture Lecture Lecture Lecture</p> | <p>1 lecture 3 lectures 1 lecture 1 lecture</p> |
| <p>8.2.PRACTICAL WORK Number of hours – 14 Adaptations of organisms to the limited action of abiotic factors – activity in the field Methodologies used in ecology studies of soil - the determination in the field of some physical and chemical parameters of soil - a sampling of soil in order to study microfauna and microflora – activity in the field - estimation of micro-organisms through the most probable number method - the separation of microarthropods by using Berlese-Tullgren method Studying the effects of farming practices on the soil breath by measuring this parameter <i>on site</i> using closed chamber method Monitoring the assimilation capacity of plants using portable system CIRAS 2. The influence of natural and anthropogenic factors Monitoring key indicators of water quality Verification of knowledge</p> | <p>Fieldwork Laboratory activity Laboratory activity Laboratory activity Laboratory activity and fieldwork</p> | <p>1 laboratory session 2 laboratory sessions 1 laboratory session 1 laboratory session 1 laboratory session</p> |
| <p>Compulsory bibliography: 1. Fițiu A., <i>Ecologie și Protecția Mediului</i>, Ed. Academicpres, 2002 2. Maxim, A., <i>Ecologie generală și aplicată</i>, Editura Risoprint Cluj-Napoca, 2008 3. Maxim, A. – coordonator, <i>Agrobiodiversitate și bioconservare</i>. Editura Risoprint Cluj-Napoca, 2010 4. Puia, I., Soran, V., Rotar, I., <i>Agroecologie, ecologism, ecologizare</i>. Editura Genesis, Cluj-Napoca, 1998 5. Șandor, M., Maxim, A., <i>Ecologie. Lucrări practice</i>. Editura AcademicPres, Cluj-Napoca, 2009</p> | | |
| <p>Optional bibliography: 1. Jarvis, D.I., Padoch, C., Cooper, H.D., <i>Managing Biodiversity in Agricultural Ecosystems</i>. Columbia University Press, New York, 2007 2. Kontoleon, A., Pascual, U., Smale, M., <i>Agrobiodiversity Conservation and Economic Development</i>, Routledge, London and New York, 2005. 3. Toncea I., <i>Ghid practic de agricultură ecologică</i>, Ed. Academicpres, 2002</p> | | |

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 where are debated current agroecology and environmental protection issues.

10. Evaluation

| Type of activity | 10.1. Evaluation criteria | 10.2. Evaluation type | 10.3. Percentage of the final grade |
|--------------------------|--|-------------------------------|-------------------------------------|
| 10.4. Course | Biological systems Biotic and abiotic ecological factors Structure and functions of ecosystems Special features of agricultural ecosystems Classification of power engineering in agroecosystems Farming systems Environmental damage and protection | Oral exam | 70% |
| 10.5. Seminar/Laboratory | Methodologies used in ecology studies of soil Studying the effects of farming practices on the soil breath and the assimilation capacity of plants Monitoring key indicators of water quality | Verification of knowledge (4) | 30% |

10.6. Minimum performance standards

Mastering scientific information provided during lectures and practical work at an acceptable level. Obtaining 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) **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
Professor Ph.D. Aurel MAXIM

Laboratory work/seminar coordinator
Senior Lecturer Mignon ȘANDOR

Approved by the
department on
05.09.2019

Head of the Department
Professor Ph.D. Marcel DUDA