



Nr. \_\_\_\_\_ from \_\_\_\_\_

Form code USAMV 010101011

**COURSE DESCRIPTION****1. General data**

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. Domain of study	Agronomy
1.5. level of study <sup>1)</sup>	Bachelor
1.6. Specialization/ Program of study	Agriculture
1.7. Form of teaching	IF

**2. Characteristics of the course**

2.1. Name of the course	Microbiology							
2.2. Course leader	Prof.dr. Roxana Vidican							
2.3. Coordinator of the laboratory/seminars activity	Lect. dr. Vlad Stoian							
2.4. Year of study	I	2.5. Semester	II	2.6. Type of Evaluation	Summative	2.7. Course regime	Content <sup>2</sup>	DF
							Level of compulsory <sup>3</sup>	DI

**3. Total estimated time (hours/semester for the teaching activities)**

3.1. Number of hours/week-frequency form	4	of which: 3.2. course	2	3.3. seminar/ laboratory/ project	2
3.4. Total hours in the teaching curricula	56	Of which: 3.5. course	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					15
3.4.2. Additional documentation in the library, electronic platforms and field experiences					15
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					10
3.4.4. Tutorials					10
3.4.5. Examinations					9
3.4.6. Other activities					
3.7. Total hours of individual study	59				
3.8. Total hours per semester	115				
3.9. Number of credits <sup>4</sup>	4				

**4. Prerequisites (if applicable)**

4.1. curriculum-related	Physiology, Biochemistry, Genetics, Pedology, Agrochemistry
4.2. skills-related	The student should have knowledge concerning the metabolic processes, intracellular chemical processes, soil as living environment and changes in soil nutrients.

**5. Conditions (if applicable)**

5.1. for the course	The course is interactive, students can ask questions regarding the content of the exposure. Academic discipline require compliance Time start and end of the course. Will
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	must be closed.
5.2. for the seminar/ laboratory/ project	For practical work is mandatory consultation of practical handbook, each student will develop an individual activity with laboratory materials that are available and described in the handbook. Academic discipline is imposed for the duration of entire works.

## 6. Cumulated specific competences

Professional competences	<p>To know the specific language for the discipline of Microbiology.</p> <p>To understand the role of microorganisms in nature</p> <p>To know the main groups of microorganisms</p> <p>To acquire general microbiology techniques and the conduct of work in a laboratory</p> <p>To know the general characteristics of viruses, bacteria, algae, protozoa and fungi</p> <p>To know the microscopic examination techniques</p> <p>To know the elements of microbial genetics and immunology</p> <p>To learn thoroughly the fundamental concepts of microbiology, its interdisciplinary nature and its impact on various areas of human activity.</p>
Transversal competences	<p>To demonstrate ability to assess microbial component of an ecosystem</p> <p>It can develop conservation projects and stimulate microbial activity analyzed according to the specific ecosystem</p> <p>To be able to think scientific activities and decision concerning the extension and activity of microorganisms on ecosystem level / area / region, including installation of experiences</p> <p>To demonstrate concerns about professional development by engaging in investigations technological impacts on the structure and dynamics of microbial component</p> <p>To participate in the research lab and field experiences of the discipline</p>

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

7.1. Subject general objective	To acquire knowledge about the fundamental concepts of microbiology with knowledge of the anatomy and morphology of the main groups of microorganisms at the current requirements level.
7.2. Specific objective	<p>To understand the distribution of microorganisms at the level of ecosystems in our country and globally.</p> <p>To identify the microorganisms and to be able to assess their activity and role in nutrients circuit at the ecosystem's level.</p> <p>To know the factors that influence the distribution and activity of microorganisms, and inter-relationships between them.</p>

## 8. Content

8.1. COURSE Number of hours - 28	Methods of teaching	Observations
<b>Object of study and the importance of microbiology.</b>	Lecture	1 lecture
<b>Viruses:</b> morphology, anatomy, replication, chemical composition, taxonomy, host-virus relations, bacteriophages, cyanophages and viroids Interferons. Bacteriophages. Cyanophages. Mycoviruses. Viruses in the soil. Prions.	Lecture	1 lecture
<b>Bacteria:</b> anatomy, cell structure, growth, nutrition, the role of bacteria in soil, ecology, taxonomy.	Lecture	2 lectures
<b>Fungi:</b> morphology, anatomy, nutrition, multiplication, taxonomy.	Lecture	2 lectures
<b>Algae:</b> morphology, anatomy, nutrition, multiplication, taxonomy.	Lecture	1 lecture
<b>Other groups of microorganism.</b>	Lecture	2 lectures
<b>Behavior of microorganisms to the action of</b>	Lecture	1 lecture

<b>ecological factors.</b>	Lecture	1 lecture
<b>Microbial positive interactions</b>	Lecture	1 lecture
<b>Microbial negative interactions.</b>	Lecture	1 lecture
<b>Influence of agricultural technologies on microorganism: fertilizers, amendments, soil tillage, pesticides.</b>	Lecture	1 lecture

<b>8.2.PRACTICAL WORK</b> <b>Number of hours - 28</b>		
Organization of a microbiology laboratory. Materials and laboratory equipment. Safety rules in the laboratory of microbiology.	Theoretical and practical work	1 laboratory work
Apparatus for study in microbiology. Magnifying glass, microscope, electron microscope.	Theoretical and practical work	1 laboratory work
General microbiological techniques. Sterilization. Methods of sterilization in microbiology.	Theoretical and practical work	1 laboratory work
Preparation of culture media for microorganisms.	Practical work	1 laboratory work
Inoculation techniques for microorganisms.	Practical work	1 laboratory work
Study of cultural characteristics of microorganism and isolation in pure cultures.	Practical work	2 laboratory work
Conduct of the microscopic examination. Examining morphological and tinctorial characters of microorganisms.	Practical work	2 laboratory work
Methods of quantification of microbial cells.	Practical work	1 laboratory work
Determination of soil respiration and microbial biomass.	Practical work	1 laboratory work
Management of microbial resources from agricultural soils - reaction to technologies.	Practical work	1 laboratory work
<i>Compulsory bibliography:</i>		
1. VIDICAN ROXANA, (2005) - <i>Notite de curs</i>		
2. PAMFIL DORU (1999) - <i>Microbiologie</i>		
3. PAMFIL DORU, HENEGARIU OCTAVIAN (1996) - <i>Microbiologie generala</i>		
<i>Facultative bibliography:</i>		
1. Dragan - Bularda O. (2000) - <i>Microbiologie</i>		

**9. Corroboration of the subject content with the expectations of the epistemic communities' representatives, of the professional associations and representatives employers in the domain**

In order to identify ways of modernization and continuous improvement of teaching and course content with the current issues and practical problems the teachers participate in symposiums organized by University of Agricultural Sciences and Veterinary Medicine in the country, Symposiums in areas of interest organized by universities in the country and abroad, the annual meeting of the Romanian Society of Grassland and other Societies working in areas of interest where they meet with farmers being discussed current and future aspects of the dynamics of Microbiology in Romania and Europe

**10. Evaluation**

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
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<p><b>10.4. Course</b></p>	<p>Knowing the importance of microbiology and relations with other sciences.          Knowing the characteristics and morphology of viruses.          Assimilation of knowledges regarding the general characteristics of the morphology and anatomy of bacteria and fungi.          Deepening aspects of soil microbiology, role of microorganisms in the circuit elements in soil.          Mastering knowledge regarding microbial genetics and immunology elements, understanding the phenomenon of immunity or acquired resistance.          Understanding changes in the behavior of microorganisms under the influence of ecological factors, fertilization and amendment and treatments with plant protection substances.          Assimilation of concepts about fermentation processes and microorganisms actions on agricultural products.</p>	<p>Sumative          Theoretical exam          +          Activity at course and interest shown</p>	<p>70%</p>
<p><b>10.5. Seminar/Laborator</b></p>	<p>Knowing the general microbiological techniques.          Learning the information about the preparation of culture media and techniques for inoculation of microorganisms.          Correctness of microscopic examination of morphological and tinctorial characters of microorganisms.          Mastering the art of execution smears and staining.          Knowing the microbiology fermentation techniques.</p>	<p>Practical activity and verification results.</p>	<p>30%</p>

**10.6. Minimal standard of performance**

Knowing of scientific information transmitted through lectures and practical work at an acceptable level.  
 Obtaining the pass mark in continuous assessment is a condition of graduation.

- <sup>1</sup> level of study – to be chosen one of the following – Bachelor /Post graduate/Doctoral
- <sup>2</sup> Course regime (content)- for bachelor level it will be chosen one of the following - DF (fundamental subject), DD (subject in teh domain), DS (specific subject ), DC (complementary subject).
- <sup>3</sup> Course regime ( compulsory level)- to be chosen one of the following – DI (compulsory subject) DO ( Optional subject) DFac ( Facultative subject).
- <sup>4</sup> One ECTS is equivalent with 25-30 de hours of study (didactical and individual study).

Filled in on  
04.09.2019

Course coordinator  
Prof. dr. Roxana Vidican

Leader of the laboratory/seminars  
Lect. dr. Vlad Stoian

Approved by the  
department on  
05.092019

Department manager  
Prof. dr. Marcel Dida



