No._____of _____ **Form code USAMV 0101020111**

COURSE DESCRIPTION

1. General data

1.1. Higher Education Institution	University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca
1.2. Facultaty	Agriculture
1.3. Departament	Plant culture
1.4.Domain of study	Agronomy
1.5.level of study[1)]	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	II	2.5. Semester	I	2.6. Type of Evaluation	summative	2.7. Course regime	Content[2]	DF
							Level of complulsory[3]	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
Distribution of time					hours
Distribution of the time allotted					15
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					15
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					6
3.4.4. Tutorials					8
3.4.5. Examinations					
3.4.6. Other activities	64				
3.7. Total hours of individual study	120				
3.8. Total hours per semester	4				

4. Prerequisites (if applicable)

4.1. of curriculum	Physiology, Biochemistry, Genetics, Pedology, Agrochemistry
4.2. of competences	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. of course development	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 not be tolerated any other activities during the lecture and mobile phones must be closed.

ecological factors.	Lecture	1 lecture
Microbial positive intarctions	Lecture	1 lecture
Microbial negative interactions.	Lecture	1 lecture
Influence of agricultural technlogies on microorganism: fertilzers, amendments, soi tillage, pesticides.	Lecture	1 lecture

8.2.PRACTICAL WORK **Number of hours – 28**		
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 quantifficatio of microbial cells.	Practical work	1 laboratory work
Determination of soil respiration and microbial biomass.	Practical work	1 laboratory work
Management of microbial resourcesfrom agricultural soils – reaction to technologies.	Practical work	1 laboratory work

Compulsoru bibliography::

1. *VIDICAN ROXANA, (2005) –Notite de curs*
2. *PAMFIL DORU (1999) –Microbiologie*
3. *PAMFIL DORU, HENEGARIU OCTAVIAN (1996) – Microbiologie generala*

Facultative bibliography:

1. *Dragan –Bularda O. (2000) - Microbiologie*

9. Corroboration of the subject content with teh expectations of the epistemic communities` representatives,of the proffesional 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

	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

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

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	To understand the distribution of microorganisms at the level of ecosystems in our country and globally. To identify the microorganisms and to be able to assess their activity and role in nutrients circuit at the ecosistem`s level. To know the factors that influence the distribution and activity of microorganisms, and inter-relationts between them.

8. Content

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

10.4. Course	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.	Sumative Theoretical exam + Activity at course and interest shown	70%
10.5. Seminar/Laborator	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.	Practical activity and verification results.	30%
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.			

[1] level of study – to be chosen one of the following – Bachelor /Post graduate/Doctoral

[2] 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).

[3] Course regime (compulsory level)- to be chosen one of the following – **DI** (compulsory subject) **DO** (Optional subject) **DFac** (Facultative subject).

[4] 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 Duda