



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

USAMV form 0102020106

## 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	II Plant culture
1.4. Field of study	Agriculture
1.5. Education level	Bachelor
1.6. Specialization/ Study programme	Montanology
1.7. Form of education	Full time

## 2. Information on the discipline

2.1. Name of the discipline	Plant Physiology I							
2.2. Course coordinator	Assistent Profesor PhD. Ștefania Gâdea							
2.3. Seminar/ laboratory/ project coordinator	Lecturer PhD. Sorin Vătcă							
2.4. Year of study	2	2.5. Semester	3	2.6. Type of evaluation	Continuous	2.7. Discipline status	Content <sup>2</sup>	FD
							Compulsoriness <sup>3</sup>	CD

## 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 book, textbook, bibliography and notes					20
3.4.2. Additional documentation in the library, specialized electronic platforms and field					15
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					15
3.4.4. Tutorials					4
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, Biochemistry, Biophysics, Genetics, etc.
4.2. skills-related	The student must have knowledge on plant biodiversity

## 5. Conditions (if applicable)

5.1. for the course	The course is interactive, students can ask questions regarding the content of the course. Academic discipline requires compliance with the start and end of the course. We do not allow any other activities during the lecture, mobile phones will be turned off.
5.2. for the seminar/ laboratory/ project	At practical works is mandatory wear of the robe and compliance with safety and labor protection. Each student has an obligation to be actively involved in the experiments undertaken. During practical works, each student will develop an individual activity with laboratory materials. Academic discipline is imposed throughout the course of practical works.

## 6. Cumulated specific competences

Professional competences	<p>Learning the specific physiological language of studied discipline ;</p> <p>Knowledge of internal and external conditions that underlie the physiological processes;</p> <p>Knowledge and understanding of photosynthetic efficiency of plants C3, C4 and CAM;</p> <p>Knowing of plant growth and development mechanisms.</p>
Transversal competences	<p>Knowing the vital manifestations that characterize vegetal universe;</p> <p>Understanding the particularities of physiological processes in plants ;</p> <p>The perception of how the external environment may influence the conduct of vital manifestation in plants ;</p> <p>Participation in research carried out in interdisciplinary fields.</p>

## 7. Course objectives (based on the list of competences acquired)

7.1. General objective	Familiarizing of students with specific physiological processes in plants; Providing a knowledge base and skills in the agriculture field, giving students the possibility to learn vital manifestations in plants, but also offering a practical alternative intervention depending on the production interests.
7.2. Specific objectives	To acquire practical skills for experimental demonstration of the main and vital manifestations in vegetal body ; Formation of practical skills and education information in plant physiology domain.

## 8. Content

<p><b>8.1. COURSE</b>  <b>Number of hours – 28</b>  <b>Introduction in Plant Physiology</b>  <b>Cell Plant Physiology</b>                      Physiological functions of cellular components                      Physical and physiological property of cellular living matter.  <b>Plants Water Regime</b>                      Root and Extra-root Absorption of water.                      Circulation of water in plants.                      Transpiration and guttate. Their role in plant life.                      The water balance of plants  <b>Verification test 1</b>  <b>Plants Mineral Nutrition</b>                      Root and Extra-root absorption of mineral salts and the factors influencing it                      Accumulation, transport and secretion of mineral substances at plants                      The physiological role of macro- and micro-elements                      The physiological base for applying mineral and organic fertilizers  <b>Photosynthesis in plants</b>                      Definition and importance of photosynthesis.                      Carbon sources for photosynthesis.                      The mechanism of photosynthesis and types of photosynthesis in plants.                      Photosynthesis and agricultural production.                      Factors that influence the photosynthesis mechanism.  <b>Verification test 2</b></p>	<p>Teaching methods</p> <p>Lecture Lecture</p> <p>Lecture</p> <p>Lecture</p> <p>Lecture</p>	<p>Observation 1 lecture = 2 hours 1 lecture 2 lectures</p> <p>3 lectures</p> <p>Written paper 2 lectures</p> <p>4 lectures</p> <p>Written paper</p>
<p><b>8.2. PRACTICAL WORKS</b>  <b>Number of hours – 28</b>                      Labor protection. Presentation of laboratory and specific work methodology of discipline .                      Physical processes involved in water supply in plant cells.                      Determination of osmosis and plasmolysis in plant cells.                      Determination of osmotic pressure and suction force at the plant cells.                      Practical testing cell semi-permeability property.                      Verification test 1                      Water regime of plants. Extra-root and root absorption of water the plants.</p>	<p>Teaching methods</p> <p>Lecture</p> <p>Experimental study</p> <p>Experimental study</p> <p>Experimental study</p> <p>Experimental study</p>	<p>Observation 1 lab work = 2 hours work 1 lab work</p> <p>1 lab work</p> <p>1 lab work</p> <p>1 lab work</p> <p>1 lab work</p> <p>1 lab work</p>

The driving forces that contribute to the water circulation path in plant body.	Experimental study	1 lab work
Study of structure and density determination of stomata on the lamina leaf surface.	Experimental study	1 lab work
Transpiration intensity and opening degree determination of stomata osteols .	Experimental study	1 lab work
Guttate and artificial induction of this physiological process.	Experimental study	1 lab work
Mineral nutrition. Macro-chemical and micro methods for identification of mineral ions.	Experimental study	1 lab work
Chlorophyll pigments study: extraction, separation, physical and chemical properties.	Experimental study	1 lab work
Determining methods for photosynthesis intensity .	Experimental study	1 lab work
Checking knowledge. Practical Colloquium.		1 lab work
<b>Compulsory bibliography:</b>		
1. Courses notice;		
2. Ștefania Gâdea, 2003, <i>Fiziologie vegetală</i> , Ed. AcademicPres, Cluj-Napoca;		
3. Ștefania Gâdea, 2013, <i>Fiziologia plantelor</i> , Ed. AcademicPres, Cluj-Napoca;		
4. Suciu T. și colab., 1982, <i>Fiziologie vegetală</i> , Ed. Did. și Ped., București;		
5. Vâta S. și colab., 2008, <i>Fiziologie vegetală – lucrări practice</i> , Ed. AcademicPres, Cluj-Napoca.		
<b>Optional bibliography:</b>		
1. Trifu M., Bărbat I., 1997, <i>Fiziologia plantelor (capitole alese)</i> , Ed. Viitorul Românesc, Cluj-Napoca;		
2. Suciu T., Ștefania Gâdea, 1997, <i>Fiziologia plantelor – Lucrări practice</i> , Tipo Agronomia, Cluj-Napoca;		
3. Cristina Dobrotă, Yamashita M., 1999, <i>Creșterea și dezvoltarea plantelor</i> , Ed. Risoprint, Cluj-Napoca.		

**9. Corroborating the course 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 new ways for modernization and continuous improvement of teaching and course content with the current issues and practical problems, teachers are participating in symposiums and scientific conferences in the vegetal physiology domain.

**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>	Knowledge of the physiological processes and manifestations of the plants, but also the alternative of a practical intervention, depending on the production interests	Continuous	70%
<b>10.5. Seminar/Laboratory</b>	Understanding the physiological phenomena and following them in the agricultural practice; Acquiring the main research methods specific to plant physiology and their practical applications.	Verification test and practical colloquium	30%
<b>10.6. Minimum performance standards</b>			
Mastery of scientific information transmitted through lectures and practical work at an acceptable level. Getting the pass note at verification checks is a condition of graduation.			

<sup>1</sup> Education levels- choose of the three options: Bachelor\* Master/Ph.D.

<sup>2</sup> Discipline status (content)- for the undergraduate level, choose one of the options:- FD (fundamental discipline), BD (basic discipline), CS (specific disciplines-clinical sciences), AP (specific disciplines-animal production), FH (specific disciplines-food hygiene), UO (disciplines based on the university's options).

<sup>3/</sup> Discipline status (compulsoriness)- choose one of the options – CD ( compulsory discipline) OD (optional discipline) ED ( elective discipline).

<sup>4</sup> One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

<sup>5/</sup> Disciplines: AK- Advanced knowledge, CT- Complementary Training, S- Synthesis

Filled in on  
4.09.2019

Approved by the  
department on  
5.09.2019

Course coordinator  
Assistant prof. PhD Ștefania Gâdea

Laboratory work/seminar coordinator  
Lecturer PhD Sorin Vâta

Head of the Department  
Professor. PhD Marcel Duda