UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Facultatea de Agricultură
Calea Mănăştur 3-5, 400372, Cluj-Napoca, România
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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 2**							
2.2. Course coordinator	Assistent Profesor PhD. Ştefania Gâdea							
2.3. Seminar/ laboratory/ project coordinator	Lecturer PhD. Sorin Vâtcă							
2.4. Year of study	2	2.5. Semester	4	2.6. Type of evaluation	Summative	2.7. Discipline status	Content[2]	FD
							Compulsoriness[3]	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[4]	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 and main physiological processes previously studied

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	To acquire and use specific discipline terms and physiologically language; To understand the physiological and processes mechanisms of plants ; To know how to intervene in the life processes of plants.
Transversal competences	Knowing the vital manifestations that characterize vegetal universe; Understanding the particularities of physiological processes in plants ; The perception of how the external environment may influence the vital manifestation in plants ; Participation in research carried out in interdisciplinary fields.

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

8.1. COURSE	Teaching methods	Observation
Number of hours – 28		1 lecture = 2 hours
Plant respiration	Lecture	2 lectures
The respiration and the role of mitochondria in the process.		
Factors that influence aerobic and anaerobic respiration of plants.		
Respiratory quotient.		
Plant growth	Lecture	3 lectures
Stages and mechanisms of growth at different plant organs.		
The physiological role of stimulators and inhibitors in plants.		
The physiological role of retardants and their practical applications.		
Resting state at plants. Types of rest.		
Seed germination.		
Correlations, polarity and regeneration in plants.		
Plants development	Lecture	4 lectures
Vernalization plants.		
Photoperiodicity and phytochrome implications.		
Factors that influence vernalization and photoperiodicity.		
Physiology of pollination, fecundation, growth and maturation at seeds and fruits .		
Plant movements	Lecture	2 lectures
Active and passive movements of plants.		
Physiological diseases in crop plants	Lecture	3 lectures
The peculiarities of the plant physiological disorders		

8.2. PRACTICAL WORKS	Teaching methods	1 lab work
Number of hours – 28		(2 hours / work)
Respiration and respiration types at plants.	Experimental study	1 lab work
Determination of respiration intensity at different types of germinated seeds.	Experimental study	1 lab work
Determination of the oxido-reductive enzymes.	Experimental study	1 lab work
The enzymatic and acid hydrolysis of the starch.	Experimental study	1 lab work
Sucrose invert .	Experimental study	1 lab work
Seed germination. Factors that influence the germination process at seeds.	Experimental study	1 lab work
Verification test .		1 lab work

Identifying areas of growth in the various compartments of the plant.	Experimental study	1 lab work
The influence of growth regulators and inhibitor in plant .	Experimental study	1 lab work
Movements in inferior plants and their microscopic visualization.	Experimental study	1 lab work
Growth movement in superior plants. Geo-tropism and photo-tropism.	Experimental study	1 lab work
Symptoms of deficiency in plants due to physiological diseases.	Experimental study	1 lab work
Determining physiological disease resistance in plants.	Experimental study	1 lab work
Checking knowledge. Practical Colloquium.		1 lab work

Compulsory bibliography:

1. Courses notice;
2. Ştefania Gâdea, 2003, *Fiziologie vegetală*, Ed. AcademicPres, Cluj-Napoca;
3. Ştefania Gâdea, 2013, *Fiziologia plantelor*, Ed. AcademicPres, Cluj-Napoca;
4. Suciu T. şi colab., 1982, *Fiziologie vegetală*, Ed. Did. şi Ped., Bucureşti;
5. Vâtca S. si colab., 2008, *Fiziologie vegetală – lucrări practice*, Ed. AcademicPres, Cluj-Napoca.

Optional bibliography:

1.Trifu M., Bărbat I., 1997, *Fiziologia plantelor (capitole alese)*, Ed. Viitorul Românesc, Cluj-Napoca;
2. Suciu T., Ştefania Gâdea, 1997, *Fiziologia plantelor – Lucrări practice*, Tipo Agronomia, Cluj-Napoca;
3. Cristina Dobrotă, Yamashita M., 1999, *Creşterea şi dezvoltarea plantelor*, 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 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
10.4. Course	Knowledge of the physiological processes and manifestations of the plants, but also the alternative of a practical intervention, depending on the production interests	Summative	70%
10.5. Seminar / Laboratory	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%
10.6. Minimum performance standards			
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.			

[1] Education levels- choose of the three options: Bachelor/ * Master/Ph.D.

[2] 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).

[3] Discipline status (compulsoriness)- choose one of the options – **CD** (compulsory discipline) **OD** (optional discipline) **ED** (elective discipline).

[4] One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

[5] * Disciplines: AK- Advanced knowledge, CT- Complementary Training, S- Synthesis

Filled in on 4.09.2019

Course coordinator
Assistant prof. PhD Ştefania Gâdea

Laboratory work/seminar coordinator
Lecturer PhD Sorin Vâtcă

Approved by the department on 5.09.2019

Head of the Department
Professor. PhD Marcel Duda