UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Facultatea de Agricultură
Calea Mănăştur 3-5, 400372, Cluj-Napoca, România
Tel: 0264-596.384, Fax: 0264-593.792
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Nr._____from_____ Form USAMV 0107010114

DISCIPLINE FILE

1. 1. Program data

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
1.2. Faculty	Agriculture
1.3. Department	III Protection of the environment and plants
1.4. The field of studies	Environmental Engineering
1.5.Cycle of studies[1)]	License
1.6. Specialization / Study program	Environmental Engineering
1.7. Form of education	IF

2. Data Discipline

2.1. Name of the discipline	**Physics 2**							
2.2. Holder of course activities				PhD.Lecturer. Călin SAFIRESCU				
2.3. Holder of seminar / laboratory / project activities				PhD. Ing. Claudia BALINT				
2.4. Year of study	I	2.5. Semester	II	2.6. Type of evaluation	Keep going	2.7. The discipline regime	Content 2	DF
							Obligatory3	DI

3. Estimated total time (hours per semester of teaching activities)

3.1. Number of hours per week - frequency form	1	3.2. of which: 2 courses	1	3.3. seminar/ laborator/ proiect	1
3.4. Total hours of the educational plan	28	3.5. of which: 2 courses	14	3.6.seminar/laborator	14
Distribution of the time fund					ore
3.4.1. Study after manual, course support, bibliography and notes					15
3.4.2. Additional documentation in the library, on specialized electronic platforms and in the field					10
3.4.3.Preparation of seminars / laboratories / projects, topics, reports, portfolios and essays					20
3.4.4.Tutoriala					10
3.4.5.Examinations					7
3.4.6. Other activities					-
3.7. Total hours of individual study	62				
3.8. Total hours per semester	90				
3.9. Number of credits[4]	3				

4. Preconditions (where applicable)

4.1. of curriculum	Math, Chemistry
4.2. of skills	The student should have a minimum knowledge of the processes that take place in the environment.

5. Conditions (where applicable)

5.1. development of the course	The course is interactive based on oral presentation and Power Point presentation. Students can ask questions about the content of the exhibition and they have to

	comply schedule for the course.
5.2. . for conducting the seminar / laboratory / project	In practical works it is compulsory to consult the practical guide, each student will carry out an individual activity with the laboratory materials made available and described in the practical works guide. Academic discipline is required throughout the duration of the work.

6. Specific skills acquired

Professional skills	Definition and description of the concepts regarding the atomic and molecular structure of the substance. Conducting the activity of the fundamental phenomena of physics with practical application, taking into account the processes that take place in the environment.
Transversal competences	Creating, among students, skills for tracking, describing and understanding physical phenomena Participation in research activities by involving students in the experiences of interdisciplinary projects. Efficient use of information sources and resources for communication and assisted vocational training (Internet portals, specialized software applications, databases, online courses, etc.).

7. The objectives of the discipline (based on the grid of specific skills acquired)

7.1. The general objective of the discipline	The acquisition of theoretical and practical knowledge regarding the phenomena of physics. Development of skills and creative spirit in order to train specialists in the field. Understanding of the principles of atomic physics and of specific interactions.
7.2. Specific objectives	Knowledge of the laws and principles of atomic physics; Knowledge of the fundamental notions of atomic physics; Studying the atomic and molecular structure; Knowledge of the techniques and methods used to study atomic physical phenomena; Combining theoretical and experimental results. The habit of teamwork. Arguing a scientific hypothesis.

8. Contents

8.1.COURSE **Number of hours – 14**	Metode de predare	Observaţii
➢ Atomic and molecular structure of the substance.	Lecture	2 hours
➢ Interaction between photons and atoms.	Lecture	2 hours
➢ Atomic models. Rutherford's model. The atomic model of N. Bohr.	Lecture	2 hours
➢ Atomic spectra. Spectral series of hydrogen atoms. Quantification of the energy of atoms with several electrons.	Lecture	2 hours
➢ Mass spectrometry. Ion separation methods	Lecture	2 hours
➢ Radioactivity and properties of ionizing radiation.	Lecture	2 hours
➢ Interaction of nuclear radiation with the substance.	Lecture	2 hours

8.2. PRACTICAL WORK		
Number of hours – 14	Problematization,	
Labor protection.	exemplification	2 hours
Determination of electron charge (s).	Problematization,	2 hours
Study of the external photoelectric effect. Determination of Planck's constant.	exemplification	2 hours
	Problematization,	2 hours
The study of the emission spectra with the help of the spectroscope.	exemplification	2 hours
	Problematization,	
Determination of Rydberg's constant (R) from the Balmer spectral series of hydrogen.	exemplification	2 hours
	Problematization,	
Determination of radioactivity. The law of radioactive decay. Geiger – Muller counter. Characteristics.	exemplification	2 hours
	Problematization,	
Colloquy	exemplification	
	Problematization,	
	exemplification	

Bibliography Required:

Max Bohr, Fizica Atomică, Ed. Ştiinţifică, Bucureşti, 1973
Ion M.Popescu, Fizica. Noţiuni de mecanică cuantică, Ed. Politehnica Press, Bucureşti, 2007

Optional bibliography:

1,C.A.Dissescu, I.Luca, M.Tudor, M.L.Dăbulescu, D.Georgescu, V.Şoltuz, *Fizică şi climatologie agricolă,* EDP, Bucureşti,1971.
2. Young DH, Freedman RA. University Physics. San Francisco: Pearson Education, Inc., 2008

9. Corroborating the contents of the discipline with the expectations of the representatives of the epistemic communities, professional associations and representative employers in the field related to the program

For the continuous improvement of the teaching and the content of the course, with the most current topics and practical problems, the teachers participate in the Annual Symposium organized by the faculties of the faculty of the USAMV consortium and scientific events with similar theme.

10. Evaluation

Activity type	10.1. Evaluation criterias	10.2. Methods of evaluation	10.3. Weight in the final grade
10.4. Course	Knowledge of the presented topic the course	Keep going	60%
10.5. Seminar / Laboratory	Knowledge of the presented topic to practical work	Activity in practical works and results in the laboratory colloquium Specialized reports Test results	20% 10% 10%
10.6. Minimum standard of performance			
Mastery of scientific information transmitted through lectures and practical papers at an acceptable level. Obtaining the passing grade (5) for practical work is a condition of promotability.			

[1] The cycle of studies - one of the variants is chosen - Bachelor / Master / Doctorate

[2] Regimul Discipline regime (content) - for the license level one of the variants is chosen - DF (fundamental discipline), DD(disciplina din domeniu), DS (disciplina de specialitate), DC (disciplina complementara).

[3] The discipline regime (compulsory) - one of the variants is chosen - DI (compulsory discipline) DO (optional discipline) DFac (optional discipline).

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

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Date completed
04.09.2019

Course holder
PhD.Lecturer Călin SAFIRESCU

Holder of laboratory works / seminars
PhD. Ing. Claudia BALINT

Date of approval in the department
05.09.2019

Deputy Director of the Department
PhD. Professor Ioan OROIAN