UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Facultatea de Agricultură
Calea Mănăştur 3-5, 400372, Cluj-Napoca, România
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Nr._____from_____ Form USAMV 0107010104

DISCIPLINE FILE

1. Program data

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
1.2. Faculty	Faculty of Agriculture
1.3. Department	Environmental and plant protection
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 1							
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	I	2.6. Type of evaluation	summative	2.7. The discipline regime	Content [2]	DF
							Obligatory[3]	DI

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

3.1. Number of hours per week - frequency form	4	of which: 3.2. course	2	3.3. seminar / laboratory / project	2
3.4. Total hours of the educational plan	56	of which: 3.5.course	28	3.6.seminar / laboratory	28
Distribution of the time fund					ore
3.4.1.Study after manual, course support, bibliography and notes					8
3.4.2. Additional documentation in the library, on specialized electronic platforms and in the field					6
3.4.3.Preparation of seminars / laboratories / projects, topics, reports, portfolios and essays					10
3.4.4.Tutoriala					6
3.4.5. Examinations					4
3.4.6. Other activities					-
3.7. Total hours of individual study	34				
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	Informatics

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	At the practical work it is compulsory to consult the practical tutor, each student will carry out an individual activity with the laboratory materials made available and described in the practical work tutor. The academic discipline is required throughout the duration of the work.

6. Specific skills acquired

Professional skills	The acquisition of theoretical and practical knowledge regarding the physical phenomena encountered in living structures; - Knowledge of the physical phenomena that occur in the atmosphere and their interdependence. Studying the influence of weather conditions and climatological factors on the growth and distribution of plants. - Creating a quick system of appreciation of the situations created by the meteorological conditions on the plants. - All these problems are addressed using the methods, principles and laws of physics.
Transversal competences	Creates students' skills for tracking, describing and understanding phenomena in any field of activity Participation in research activities by involving students in the experiences of interdisciplinary projects.

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

7.1. The general objective of the discipline	Acquiring theoretical and practical knowledge regarding physical phenomena. Development of skills and creative spirit in order to train specialists in the field.
7.2. Specific objectives	Knowledge of the laws and principles of physics. Studying the effects of physical factors (temperature, pressure, radiation, electric field, magnetic field, gravitational field, etc.) on the development and functioning of biosystems; Knowledge of the techniques and methods used in the study of physical phenomena; Knowledge of the fundamental notions of classical thermodynamics and understanding of the behavior of open systems from the point of view of thermodynamics; Studying surface and molecular phenomena;

8. Contents

8.1. COURSE **Number of hours– 28**	Teaching methods	Remarks
Introduction to the physics of the environment ➢ Energy exchange. Mass and impulse transport. Energy and mass conservation. Continuity in the biosphere	Lecture, explanation, case studies and bibliographic research	2 hours
➢ Thermodynamic parameters	Lecture, explanation, case studies and bibliographic research	2 hours
➢ The laws of thermodynamics	Lecture, explanation, case studies and bibliographic research	4 hours
➢ Proprietăţile Physical properties of environmental factors. Elements of climatology - Temperature. Typical behavior of air and soil temperature. Modeling the variation of air temperature vertically and over time. Temperature variation of the	Lecture, explanation, case studies and bibliographic research	6 hours

soil in time and in depth. Temperature and biological development - Water in the natural environment. Vapors: saturation conditions. Spatial and temporal variation in the amount of vapor in the atmosphere. Water potentials in organisms. Liquid-vapor phase transformation - The wind. The characteristics of an atmospheric turbulence. The wind as a vector. Wind speed variation modeling Mass and heat transport. Transport equations. Resistance and conductance. Turbulent transport. Conduction and convection. Mass and heat transport. Transport equations. Resistance and conductance. Turbulent transport.	Lecture, explanation, case studies and bibliographic research Lecture, explanation, case studies and bibliographic research	4 hours
➢ Conduction and convection. ➢ Radiation. Spectrum of the electromagnetic field. Black body radiation. Attenuation. The interaction of electromagnetic radiation with living tissue. ➢ Solar radiation ➢ Unconventional energy.		4 hours 6 hours

8.2. PRACTICAL WORK **Number of hours -28** ➢ Work protection	Teaching methods	2 hours
➢ Units of measurement ➢ Practical applications of the units of measurement ➢ Statistical processing of environmental physical data ➢ Determination of body mass ➢ The weather station ➢ The study of air temperature. ➢ Study of humidity and air pressure ➢ The study of atmospheric precipitation	Interactive presentation of labor protection rules in the physics laboratory Presentation of the laboratory work. The experiment, case study, heuristic conversation, processing of experimental data.	2 hours 2 hours 4 hours 4 hours 4 hours 2 hours 4 hours 2 hours
➢ Verification of knowledge	Verification method	2 hours

Bibliography Required::

Claudia Stihi, Fizica mediului şi climatologie, Editura Bibliotheca, 2009
H.Criveanu, Georgeta Taralunga, Elemente de fizica si meteorologie aplicate la biosisteme, Ed. Digital Data, 2004

Optional bibliography::

1, G. S. Campbell, J. M.Norman, Introduction to environmental biophysics, Springer-Verlag New York, Inc., 1998.
2. - John Monteith, Mike Unsworth, Environmental Physics, Academic Press, New York, 2007

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 USAMV consortium and not only.

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	E (summative)	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 for on-the-spot checks is a condition of promotability.			

[1] The cycle of studies - one of the variants is chosen - Bachelor / Master / Doctorate
[2] Discipline regime (content) - for the license level one of the variants is chosen - DF (fundamental discipline), DD (discipline in the field), DS (specialty discipline), DC (complementary discipline).
[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).

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