



UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA Facultatea de Agricultură

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USAMV form 0102020104 (discipline code)

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	Crop Plant
1.4. Field of study	Agronomy
1.5. Cycle of study ¹	Bachelor
1.6. Specialization/ Study programme	Montanology
1.7. Form of education	Full time

2. Information on the discipline

2.1. Discipline name		GE	VETI	CS 1				11165
2.2. Course coordina	ator				Lecturer PhD. I	oana Virginia Berin	dean	
2.3. Seminar/labora	atory/	project coordi	nator	_ 8	Biologist PhD. I	onut RACZ	* . T T	TOV
2.4.V	-,,	2.5.		2.6.		2.7. Discipline	Content ²	DF
2.4. Year of study	111	Semester		Evaluatio type	n continuou	s status	Compulsoriness ³	D1

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 books, textbooks, bibliography and notes			20		
3.4.2. Additional documentation in the	e library	, electronic platforms a	nd field	d experiences	15
3.4.3. Preparing seminars/laboratori	es/ proj	ects, subjects, reports,	portfoli	ios 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		- 1		

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
4.2. skills-related	

5. Conditions (if applicable)

5.1. for the course	The course is interactive, students can ask questions about the content of the exhibition. The university discipline requires the observance of the start and end time of the course. No other activities are tolerated during the lecture, mobile phones should be closed. Delay of students to the course and laboratory will not be tolerated as this proves disruptive to the educational process.
5.2. for the seminar/ laboratory/ project	In the practical works it is compulsory the presence each student, they will carry out individual activities with the laboratory materials made available and described previously by the teacher. The academic discipline is required during the entire duration of the work.

6. Cumulated specific competences

	- To know the terminology used in Genetics
	- To demonstrate the ability to properly use the notions, concepts and legacies specific to the molecular and
= Si	cellular levels of organization and functioning of living matter.
nc nc	- To acquire the use of knowledge about heredity at the molecular and cellular level, in scientific and
ssic	technological applications.
np.	- Have the ability to critically evaluate interventions on the molecular and cellular basis of heredity,
Professional competences	including from the perspective of bioethics principles.
	- To show concern for professional development by training the skills of a researcher;
- Sa	- To participate in the research activities of the discipline laboratories;
Sa nc	- To demonstrate the involvement in scientific activities, such as the elaboration of articles and specialized
vel	studies;
Fransversal competences	- To participate in projects of a scientific nature, compatible with the requirements of integration in
Tra 100	European education.

7. Discipline objectives (based on the cumulated specific competences)

7.1. General	- To learn the mechanisms underlying the hereditary phenomenon and the causes that determine
objective	the variability of living organisms.
7.2. Specific	- To understand the material basis of heredity and variability at the cellular and molecular level;
objectives	 To understand the evolution process in the relation of organisms with the environment; To be able to apply the theoretical notions of genetics in the practical activities of creating new varieties of plants, able to make better use of technological and environmental conditions in order to
	obtain high quality and high yields.

8. Content

8.1. COURSE Number of hours –28	Teaching methods	Observation (1 lecture = 2 hours)
Genetics - science of heredity and variability	Lecture	1 lecture
The object of study of genetics		
Research methods used in genetics studies (the diversification of genetics and the		
connection with other sciences)	(A	
The biological material used in genetics studies		
The purpose and importance of genetics, achievements and perspectives		
Cell and heredity	Lecture	4 lectures
Viruses - a way of acellular organization of living matter		
Cellular organization of genetic material in prokaryotes		
Cellular organization of genetic material in eukaryotes		
Chromosome - morphology, structure, chemical composition; particular types of		
chromosomes; karyotype		
The cell cycle. Mitosis - genetic significance; factors that may influence the		
development of mitosis; types of mitosis		
The cell cycle. Meiosis - development, genetic significance		
Comparative characteristics of mitosis and meiosis		
Gametogenesis in animals and plants		
Fertilization in animals and plants		
Life cycle in animals and plants, genetic significance		
Genetic recombination in bacteria: bacterial transformation, conjugation,		
transduction and sex addiction		
Life cycle and genetic recombination of viruses		
Mendelian heredity	Lecture	2 lectures
Heredity of qualitative characters		
Dominant monogenic transmission - monohybridization, polyhybridization and		
backcrossing		
Intermediate, co-dominant, partially dominant and super-dominant monogenic		81
transmission		
Particularities of monogenic transmission	Lecture	3 lectures
Pleiotropy, gene penetrance and expressivity, dominance reversal, paramutation		
Hereditary transmission of characters in the case of interaction between non-		
genes - complementarity, epistasy		
Real deviations from Mendelian segregation - lethality; preferential segregation;		

chromosome nondisjunction and nonrandomized zygote formation		
Linkage and crossing-over	Lecture	2 lectures
Complete and incomplete linkage, biological significance		
Linkage intensity, recombination frequency and distance between genes		
Cross-over as a cytological phenomenon and its relation to genetic recombination		
The mechanism of production and factors that can influence the frequency of the		
crossingover		
Chromosomal maps		
Polygenic transmission	Lecture	2 lectures
Heredity of quantitative characters		
Types of polygenic systems and the mechanism of hereditary transmission	100	
Genetic parameters and derived genetic parameters		
Research on the genetics of intelligence		

Preparation of biological material and	
dyes	1 lab work
Highlighting chromosomes in mitosis	2 lab work
Making the karyotype	1 lab work
	1 lab work
Highlighting chromosomes in meiosis	2 lab work
Attribution test and test x2	1 lab work
Problems of applied genetics	1 lab work
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Problems of applied genetics	1 lab work
	1 lab work
	Highlighting chromosomes in mitosis Making the karyotype Highlighting chromosomes in meiosis Attribution test and test χ^2 Problems of applied genetics

- 1. Course notes
- 2. BOTEZ, C., ELENA TĂMAŞ, 2001, Genetica, Ed.Academic Pres, Cluj-Napoca;
- 3. ELENA TĂMAŞ, C. BOTEZ, 2012, Genetics, Academic Pres Ed., Cluj-Napoca;

Optional bibliography:

- 1. BOTEZ C., 1991, Genetics, Tipo Agronomy, Cluj Napoca
- 2. GALLIA BUTNARU, I.NICOLAE, ELENA, TĂMAŞ, 1999, Genetics, Mirton Ed., Timisoara
- 3. CHRISTMAS, T Luana JENSEN, 2004, Genetics and the future of humanity. Albatros Publishing House

9. Corroborating the discipline 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 ways of modernizing and continuously improving the teaching and the content of the courses, with the most current topics and practical problems, the teachers participate in sessions of scientific communications and specialized congresses as well as in meetings with the specialists in the field of genetics and plant improvement.

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 terminology used in genetics Understanding the cellular organization of living matter and genetic material Knowledge of the aspects of classical genetics Understanding the sources of recombinant genetic variability Learning the concepts of quantitative genetics	Continuous (VP)	70%
10.5. Seminar/Laboratory	Acquisition of the problems dealt with in the course and practical works Recognition of the phases of the mitotic and meiotic cell cycle Preparation of the karyotype	Continuous (VP)	30%

The ability to solve problems of applied genetics

10.6. Minimum performance standards

Knowledge of scientific information transmitted through lectures and practical papers at an acceptable level. Obtaining the passing grade for the on-the-spot checks for practical and colloquial works is a condition of promotability...

- 1 Cycle of studies choose one of the three options: Bachelor/Master/Ph.D.
- 2 according to the educational plan
- Discipline status (compulsoriness) choose one of the options DI (compulsory discipline) DO (optional discipline) DFac (facultative discipline).
- 4 One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

Filled in on 04.09.2019

Course coordinator Lecturer PhD. Ioana Virginia BERINDEAN Laboratory work/seminar coordinator Biologist PhD. Ionut RACZ

Approved by the department on 05.092019

Head of the Department Prof.dr. Marcel DUDA