



No. _____ of _____

USAMV-CN- form-0101040101

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	Agronomy
1.5. Cycle of study ¹	Bachelor
1.6. Specialization/ Study programme	Agriculture
1.7. Form of education	Full time

2. Information on the discipline

2.1. Discipline name	Phytotechnics 3 (Field plant culture)							
2.2. Course coordinator	Prof. Dan VARBAN Phd.							
2.3. Seminar/ laboratory/ project coordinator	Associate professor Sorin Muntean Phd.							
2.4. Year of study	IV	2.5. Semester	I	2.6. Evaluation type	summative	2.7. Discipline status	Continut ²	DD
							Compulsoriness ³	DI

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					24
3.4.2. Additional documentation in the library, electronic platforms and field experiences					15
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					15
3.4.4. Tutorials					5
3.4.5. Examinations					10
3.4.6. Other activities					
3.7. Total hours of individual study	69				
3.8. Total hours per semester	125				
3.9. Number of credits ⁴	5				

4. Prerequisites (if applicable)

4.1. curriculum-related	Pedology, Agrochemistry, Botany, Agro-technical, Agroecology
4.2. skills-related	The student must have knowledge about plant nutrition, physico-chemical properties of soils, biology and morphology of crop plants and weeds, diseases and pests of plants, economic damage thresholds, fish control products, irrigation regime

5. Conditions (if applicable)

5.1. for the course	The course is interactive, students can ask questions about the content of the exposure. 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
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5.2. for the seminar/ laboratory/ project	At the lab works it's obligatory 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.
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6. Cumulated specific competences

Professional competences	<p>To know the agronomic language specific to the discipline Phytotechnics</p> <p>To know the areas of favorability of plants</p> <p>Understand the mechanisms of nutrition and control of diseases and pests</p> <p>To recognize the main cultivated species, weed species, pests and diseases.</p> <p>To acquire the means of quantitative and qualitative increase of production</p> <p>To know phenophases growth and development of plants</p> <p>To master the mechanisms and adjustments to agricultural machinery used for maintenance and harvesting</p> <p>To master in thoroughly master the cultivation technologies</p>
Transversal competences	<p>Demonstrate their ability to develop a cultivation technology for field crops</p> <p>Be able to develop projects to ensure the need for fertilizers and pesticides knowing the percentage of active substance</p> <p>To be able to think of practical activities regarding the adaptation of certain elements of technology for specific conditions</p> <p>To show concern about professional development</p> <p>To participate in research activities in the field of experience of the discipline</p>

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

7.1. General objective	They will acquire knowledge about biology, plant relationships with vegetation factors and cultivation technologies
7.2. Specific objectives	<p>To customize knowledge on plant growth and development, relationships with vegetation factors and cultivation technology elements for each crop plant separately.</p> <p>To be able to develop a cultivation technology of any crop plant adapted to the pedoclimatic and economic conditions of a favorable agricultural area in the country</p>

8. Content

8.1. COURSE Number of hours - 28	Teaching methods	Observations
Tuberous and root-bearing plants Potato History - the introduction of potatoes in Europe and in the Romanian Provinces, importance, uses, spread across the globe and in our country	Lecture	1 lecture= 2 hours
The chemical composition of the tubers and the culinary quality Systematics and varieties Morphology, potato biology, vegetative rest, vegetation phases	Lecture	1 lecture= 2 hours
Potato degeneration Potato requirements for vegetation factors	Lecture	1 lecture= 2 hours
Potato cultivation technology	Lecture	2 lecture= 4 hours
Potato storing and keeping	Lecture	1 lecture= 2 hours
Sugar beet Historically, the importance of culture, spreading worldwide and in our country	Lecture	1 lecture= 2 hours
The chemical composition of the roots and the distribution of the sugar in the roots	Lecture	1 lecture= 2 hours



Systematic, hybrids and varieties, types of sugar beet		
Sugar beet morphology and biology, vegetation phases	Lecture	1 lecture= 2 hours
Sugar beet requirements for vegetation factors		
Cultivation technology	Lecture	2 lecture= 4 hours
Sugar beet harvesting, storage and recovery		
Chicory	Lecture	1 lecture= 2 hours
The importance of culture, the chemical composition of the main product, cultivated areas, systematics, varieties, biology, ecology, areas of cultivation, cultivation technology		
Hops	Lecture	1 lecture= 2 hours
Importance of culture, chemical composition of cones, cultivated surfaces, systematic, varieties, biology, ecology, culture areas, cultivation technology, drying and capitalization of cones		
Tobacco	Lecture	1 lecture= 2 hours
The importance of the crop, the chemical composition of the main product, cultivated surfaces, systematics, varieties, types of tobacco, areas of cultivation, technology of cultivation and primary processing of the leaves		

8.2. LABORATORY WORK	Teaching methods	Observations
Number of hours - 28		
Tuberous and root-bearing plants	The study of the plant	1 laboratory work= 2 hours
Potato		
The anatomical-morphological characteristics of the potato tuber		
Anatomical-morphological characteristics of the underground and above-ground part of the potato plant		
Preparation of planting material for potatoes by sorting and calibration of tubers and differentiated calculation of the amount of seed per hectare	Calibres identification and categories of impurities	1 laboratory work= 2 hours
Determination of dry matter and potato starch content by indirect methods	Identification of dry matter and starch content	1 laboratory work= 2 hours
The storage and preservation of potatoes for consumption and seed	Practical demonstration	1 laboratory work= 2 hours
Preparation of the technology file for potato cultivation for consumption or cultivation for seed	The individual study	2 laboratory work= 4 hours
Sugar beet	Plant study and seed recognition	1 laboratory work= 2 hours
Anatomical-morphological characteristics of beet roots		
Anatomical-morphological characteristics of the stems, leaves, flowers, fruits and seeds in the first and second year of vegetation, respectively		
Preparation of sugar beet seed by inlaying, drilling and sorting on sowing units	Identification of the content in dry matter and sugar	1 laboratory work= 2 hours
Determination of sugar content and dry matter		
Sugar beet root taking and processing at the Luduș sugar factory	Practical demonstration	1 laboratory work= 2 hours
Preparation of the technological file for sugar beet culture	The individual study	1 laboratory work= 2 hours
Chicory	The study of the plant	1 laboratory work= 2 hours
Anatomical-morphological characteristics of chicory roots		
Anatomical-morphological characteristics of the stems, leaves, flowers, fruits and seeds in the first and second year of vegetation, respectively		



<p>Hops Morphological characteristics of the underground parts of the hops and of the strings and side shoots, cones and seeds Variety recognition after cones conformation, cones quality assessment (bonitation); cutting at the hub and guiding the strings. Harvesting and separation of cones by mechanical procedures, drying, air conditioning and packing of cones.</p>	The study of the plant	1 laboratory work= 2 hours
<p>Tobacco Morphological peculiarities of tobacco species and types. Description of the different types of leaves according to the shape of the base and the tip, the nerve and the length ratio Take over and primary processing of tobacco leaves and fermentation at the Tobacco Fermentation Company Ocna Mureș</p>	The study of the plant	1 laboratory work= 2 hours
<p>Verification of knowledge</p>		1 laboratory work= 2 hours
<p><i>Bibliography Required:</i></p> <ol style="list-style-type: none"> 1. Vârban D. (2016).- Note de curs 2. Muntean L.S., S. Solovăstru, G. Morar, M. Duda, D. Vârban, S. Muntean, C. Moldovan, 2014, FITOTEHNIE, Ed. Risoprint, Cluj-Napoca 3. Roman Gh., G. Morar, T. Robu, M. Ștefan, V. Tabără, M. Axinte, I. Borcean, S. Cernea, 2012, Fitotehnie, Vol II Plante tehnice, medicinale și aromatice, Ed. Universitară, București 4. Salontai Al., Sevastița Muste, Maria Tofană, Carmen Puia, H. Bunescu, 2002, HAMEIUL, Ed. Risoprint, Cluj-Napoca. 5. Stănescu Z. și Gh. Rîzescu, 1976, SFECLA DE ZAHĂR, Ed. Ceres, București. 6. Aniția N., P. Marinescu, 1983, TEHNOLOGIA TUTUNULUI, Ed. tehnică, București. 7. Morar G., Cernea S., Duda M., Ștef L., 1997, Lucrări practice de Fitotehnie partea a II-a, Tipo Agronomia Cluj-Napoca. 		
<p><i>Optional bibliography:</i></p> <ol style="list-style-type: none"> 1. Muntean L.S., S. Solovăstru, G. Morar, M. Duda, D. Vârban, S. Muntean, 2008, FITOTEHNIE, Ed. AcademicPres, Cluj-Napoca. 2. Muntean L.S., S. Solovăstru, G. Morar, M. Duda, D. Vârban, S. Muntean, 2011, FITOTEHNIE, Ed. Risoprint, Cluj-Napoca. 3. Mogârzan Aglaia, G. Morar, M. Ștefan, 2004, FITOTEHNIE, Ed. Ion Ionescu de la Brad, Iași. 4. Morar G., 1999, CULTURA CARTOFULUI, Ed. Risoprint, Cluj-Napoca. 5. Morar G., 1999, PRODUCEREA ȘI ÎNMULȚIREA CARTOFULUI PENTRU SĂMÂNȚĂ, Ed. Risoprint, Cluj-Napoca. 6. Lucrări științifice Anale INCDCSZ 1967-2013 7. Revista Hameiul și plantele medicinale 2000-2013 		

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

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 meetings where they meet with farmers and specialists in the field, being debated current and perspective aspects of technology, plant cultivation, control of diseases and pests with new products and application of new forms of soil and foliage fertilizers.



10. Evaluation

Activity type	10.1. Evaluation criterias	10.2. Methods of evaluation	10.3. Percentage of the final grade
10.4. Course	Assessment of the knowledge acquired by the biology, the relations of the plants with the factors of vegetation, the technology of cultivation and conservation of the plants	Written exam	70%
10.5. Seminar / Laboratory	Recognition of the studied species Plant morphology and systematics Determination of the main components of the useful product (dry substance, starch, sugar) Presentation of the intensive technologies of cultivation of the studied plants	It is planned to evaluate the knowledge of the studied plants and to verify the cultivation technology developed by the student	30%
10.6. Minimum standard of performance			
Mastery of scientific information transmitted through lectures and practical papers at an acceptable level. Obtaining the passing mark for the practical exam is a condition of participation in the oral exam.			

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

² Discipline regime (content) - level undergraduate choose one of variantele- DF (fundamental discipline), DD (discipline domain), SD (Specialized discipline), DC (complementary discipline).

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

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

Date completed

04.09.2019

Course holder

Prof. Dan VĂRBAN Phd.

Holder of laboratory works / seminars

Associate professor Sorin Muntean Phd.

Date of approval in the department

05.09.2019

Department Director

Prof. Marcel DUDA Phd.