



No. _____ of _____

USAMV form 0102030213

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 Crop Science
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	Conditioning and storage of agricultural products							
2.2. Course coordinator	Prof.dr. Marcel M. DUDA							
2.3. Seminar/ laboratory/ project coordinator	Lecturer dr. Cristina Moldovan							
2.4. Year of study	III	2.5. Semester	I	2.6. Evaluation type	continue	2.7. Discipline status	Content 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					18
3.4.2. Additional documentation in the library, electronic platforms and field experiences					7
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					7
3.4.4. Tutorials					9
3.4.5. Examinations					5
3.4.6. Other activities					
3.7. Total hours of individual study	46				
3.8. Total hours per semester	90				
3.9. Number of credits ⁴	4				

4. Prerequisites (if applicable)

4.1. curriculum-related	Botany, Biochemistry, Agrotechnics, Agricultural machinery, Phytopathology, Entomology, Plant Physiology
4.2. skills-related	The student must have knowledge regarding: plant nutrition, biology, morphology and physiology of crop plants, weeds, diseases and pests of cultivated plants, economic damage thresholds, plant protection products, agricultural machinery adjustment.

5. Conditions (if applicable)

5.1. for the course	The course is interactive, students may ask questions regarding the content of the exposure. Academic discipline requires compliance for the time to start and end of the course. No other kind of activities are tolerated during the lecture, mobile phones must be closed.
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5.2. for the seminar/ laboratory/ project	At practical works is mandatory to consult the practical book/tutor. Each student will conduct a single or small groups activity in the laboratory using materials available and described in the practical book/tutor. Academic discipline is imposed for the duration of works.
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6. Cumulated specific competences

Professional competences	<p>To know the agronomic language specific to the discipline.</p> <p>To know the importance of conditioning and preserving the agricultural products and their evolution over time.</p> <p>To know the quality and physical qualities of the seed mass.</p> <p>To know the physiological processes in the seed table during storage.</p> <p>To understand the processes and stages of conditioning of agricultural products.</p> <p>To understand the possibilities, rules and methods of storing agricultural products.</p> <p>To be able to develop technologies for conditioning and storage of agricultural products, to organize and coordinate the technological processes in these cases.</p>
Transversal competences	<p>To carry out professional tasks responsibly, under conditions of limited autonomy and qualified assistance.</p> <p>To be familiar with the roles and activities specific to teamwork and the distribution of tasks for the levels subordinated.</p> <p>Demonstrate concern for continuous professional development.</p> <p>To participate in the activities organized to know the activity of some seed conditioning stations and warehouses for agricultural products.</p> <p>To be able to design a technological file for conditioning and preserving an agricultural product.</p>

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

7.1. General objective	To acquire knowledge on: the use of the land in our country, factors which determine field plant production, crop zoning, the importance, control and certification of seeds.
7.2. Specific objectives	Acquiring knowledge regarding the possibilities and rules for conditioning and preserving agricultural products.

8. Content

8.1.COURSE: 28 hours	Methods of teaching	Observations
GENERALITIES The importance of conditioning and preserving the agricultural agricultural products; History of preservation of agricultural products.	Lectures	1 lecture
THE QUALITY CHARACTERISTICS OF THE SEEDS Organoleptic properties; Seed mass; purity; germination; humidity; uniformity; Chemical composition.	Lectures	1 lecture
THE PHYSICAL CHARACTERISTICS OF THE SEED MASS Seed flow and natural slope formation; Autosortarea products; Density and intergranular space in seed mass; Sorption seed. Seed hygroscopicity and equilibrium moisture; Termoconductibilitatea seed.	Lectures	1 lecture
THE PHYSIOLOGICAL PROCESSES OF THE SEMIUM TABLE DURING THE STORAGE Seed breathing; Postmaturarea; germination; Become hot.	Lectures	1 lecture
CONDITIONING CROP PRODUCTS Cleaning and sorting: based on dimensions; based on the traits of bearing; by shape.	Lectures	1 lecture
Cleaning and sorting: according to the state of the components of the seed mass; based on the specific mass. Other cleaning and sorting methods.	Lectures	1 lecture
Conditioning of tobacco leaves.	Lectures	1 lecture
Conditioning of hop cones. Conditioning of plant raw material in medicinal and aromatic plants.	Lectures	1 lecture
Drying: natural; artificial - by contact with heated surfaces; hot air; combustion gas mixed with ambient air; in partial vacuum. Particularities of drying in different species.	Lectures	1 lecture
PACKAGING, LABELING AND COMPARTMENT OF VEGETABLE AGRICULTURAL PRODUCTS	Lectures	1 lecture
STORAGE OF CROP PRODUCTS- in dry condition; at low temperatures; by natural and active aeration; anaerobic; with the help of subst. chemical; by irradiation;	Lectures	1 lecture

The peculiarities of storage the crop products: cereals; legume; oil; textiles; tubers and roots; tobacco; hops and herbs.	Lectures	1 lecture
CONSTRUCTIONS FOR STORAGE OF CROP PRODUCTS		
Horizontal storage constructions; platforms; sheds; warehouses	Lectures	1 lecture
Vertical storage spaces: Silos; wood, brick, reinforced concrete or metal.		
Other storage areas.	Lectures	1 lecture
8.2.PRACTICAL WORK: 28 hours		
Determining the quality traits of the seeds: the hectolitic mass and the specific seed mass	Practical demonstration	1 laboratory work
Determination of vitrescence and natural slope of seeds	Self-study	
	Practical demonstration	1 laboratory work
Determination of seed moisture with T1 humidometer and Thermal Balance	Self-study	
	Practical demonstration	1 laboratory work
Determination of hygroscopicity and moisture balance of seeds.	Self-study	
	Practical demonstration	1 laboratory work
Determination of the seed heating phases.	Self-study	
	Practical demonstration	1 laboratory work
Seminar and watching recordings of potato storage areas	Self-study	1 laboratory work
Seed conditioning and storage		
	Self-study	1 laboratory work
Packaging, labeling and compartmentalization of seeds	Practical demonstration.	1 laboratory work
	Applications.	
Calculation of losses during seed storage	Practical demonstration.	1 laboratory work
Preparation and storage of potato tubers (visit to a production unit)	Practical demonstration.	1 laboratory work
Reception and preservation of sugar beet roots	Practical demonstration.	1 laboratory work
	Practical demonstration.	1 laboratory work
Storage by refrigeration and freezing in a modern warehouse	Practical demonstration.	1 laboratory work
	Practical demonstration.	1 laboratory work
Conditioning and storage of hops and medicinal plants	Self-study	1 laboratory work
Preparation of a technology file for conditioning and storage of a species of choice	Self-study	1 laboratory work
<i>Compulsory bibliography</i>		
1. Duda M.M., 2019, Note de curs.		
2. Muntean S., M.M. Duda, C. Moldovan, Al. Ghețe, 2018, Fitotehnie – Îndrumător de lucrări practice. Partea I. Ed. Risoprint, 317 p., ISBN 978-973-53-2273-1.		
3. Roman Gh.V., M.M. Duda, F. Imbrea, Gh. Matei, A.V. Timar, 2012. Condiționarea și păstrarea produselor agricole. Ed. Universitară, București, ISBN 978-606-591-488-9, 276 p.		
4. Duda M.M., A. Timar, 2007. Condiționarea și păstrarea produselor agricole. Ed. AcademicPres Cluj-N., 215 p., ISBN 978-973-744-073-0.		
<i>Facultative bibliography</i>		
1. Mogârzan, Aglaia, A. Rizea, M. Haraga, N. Berea, 2003 - Conservarea și păstrarea produselor agricole vegetale. Ed. „Ion Ionescu de la Brad”, Iași.		
2. Muntean L.S., S. Cernea, G. Morar, M.M. Duda, D.I. Vârban, S. Muntean și C. Moldovan, 2014. Fitotehnie. Ed. a III-a. Ed. Risoprint, Cluj-Napoca, ISBN 978-973-53-1273-2, 810 p.		
3. Thierer, L., N. Dumitrescu, I. Hustin, I. Oprescu, 1981. Tehnologia recepționării, depozitării, condiționării și conservării produselor agricole. Ed. Ceres, București.		

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 modernization and continuous improvement of teaching and course content with the current issues and practical problems teachers participate in regular meetings where they meet with farmers and

experts in specific areas being discussed current issues and future plant cultivation technology, control of pests and diseases with new products and new forms of fertilizer application on soil and foliage.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation type	10.3. Percentage of the final grade
10.4. Course	Presentation of the acquired knowledge regarding: the physical properties and the physiological processes in the seed mass during storage; the methods of conditioning and preserving agricultural products.	Continue	60%
10.5. Seminar/ Laboratory	The ability to understand and apply in practice the procedures and techniques of conditioning and control of agricultural products during storage.	Testing the ability to determine the physical properties of the seed mass and to recognize the physiological processes that occur during the preservation of agricultural products.	40%

10.6. Minimum performance standards

Sufficient mastery of the scientific information presented in lectures and practical work. Obtain the pass mark in the practical exam is a condition of participation in the oral examination..

- 1 Cycle of studies - choose one of the three options: Bachelor/Master/Ph.D.
- 2 according to the educational plan
- 3 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
Prof.dr. Marcel M. DUDA

Laboratory work/seminar coordinator
Lecturer dr. Cristina MOLDOVAN

Approved by the
department on
05.09.2019

Head of the Department
Prof.dr. Marcel M. DUDA