

## SUBJECT OUTLINE

### 1. Information on the study programme

1.1 Academic institution	<b>UNIVERSITY OF ORADEA</b>
1.2 Faculty	<b>FACULTY OF ENVIRONMENTAL PROTECTION</b>
1.3 Department	<b>AGRICULTURE, HORTICULTURE</b>
1.4 Field of study	<b>AGRONOMY</b>
1.5 Cycle of study	<b>BACHELOR</b>
1.6 Study programme/Qualification	<b>AGRICULTURE / ENGINEER</b>

### 2. Information on the discipline

2.1 Name of discipline	<b>Precision agriculture equipment</b>						
2.2 Course holder	<b>PhD. eng. DONCA Gheorghe</b>						
2.3 Seminar/Laboratory/Project holder	<b>PhD. eng. DONCA Gheorghe</b>						
2.4 Year of study	II	2.5 Semester	III	2.6 Type of evaluation	E	2.7 Regime of discipline	C

(C) Compulsory; (O) Optional; (E) Elective

### 3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	4	out of which: 3.2 course	2	out of which 3.3 seminar/laboratory/project	2
3.4 Total hours in the curriculum	56	out of which: 3.5 course	28	out of which 3.6 seminar/laboratory/project	28
Time allotment					hours
Study assisted by manual, course support, bibliography and notes					6
Additional documentation in the library/ on specialised electronic platforms and in the field					2
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					8
Tutorship					1
Examinations					2
Other activities					
<b>3.7 Total hours of individual study</b>	<b>19</b>				
<b>3.9 Total hours per semester</b>	<b>75</b>				
<b>3.10 Number of credits</b>	<b>3</b>				

### 4. Prerequisites (where appropriate)

4.1 curriculum	<b>Energetic Basis and Agricultural Machinery</b>
4.2 competences	

**5. Conditions** (where appropriate)

5.1. related to course	This discipline is mandatory, mobile phones will be used only for the course.
5.2. related to seminar/laboratory/ project	Compliance with Labour Safety and Emergency Standards in laboratory. Preparation of the report, knowledge of the notions contained in the laboratory work to be performed (synthesis material). Knowledge of the requirements for the use of equipment related to the conduct of laboratory hours.

**6. Specific competences acquired**

Professional competences	C1.1. Description of the scientific, theoretical and practical foundations underlying the development and application of sustainable agricultural production technologies. C1.3. Application of appropriate methods, techniques and procedures for the customization and optimization of technological processes of sustainable agricultural production. C1.4. Qualitative and quantitative analysis of the effects of the technologies used (physico-chemical analyzes on the obtained productions; physical, chemical and biological analyzes on the components of the environment, which may be affected by the applied agricultural technologies; use of specific methods to assess the impact of applied technologies on biodiversity).
Transversal competences	CT1. Performing our own tasks with professionalism and rigor and taking decisions specific to team work in accordance with ethical values and principles.

**7. Objectives of discipline** (coming from the specific competences acquired)

7.1 General objective	The course aims to familiarize students with the advanced equipment and machines used in sustainable agricultural production technologies.
7.2 Specific objectives	The laboratory works are designed to provide future agronomic engineers with practical skills in technology design, operation, repair and maintenance of advanced technical equipment in agriculture. The content of the laboratory are based on the need to deepen the problems presented in the course. They will understand their complexity and usefulness in treating them as such. Knowledge is useful in developing skills in addressing specific production issues facing a specialist in the field.

**8. Content\*/**

8.1 Course	Methods of teaching	No. of hours / Remarks
1. Introduction. 1.1. High precision agriculture and its technologies. 1.2.	Oral presentation,	2

Current practices in precision agriculture. 1.3. Perspectives on precision agriculture.	demonstration and discussions	
2. Informatics for precision agriculture. 2.1. Basic information. 2.2. Software for precision agriculture. 2.3. Data processing software packages. 2.4. Support software solutions.	Idem	2
3. Measuring and monitoring equipment for precision agriculture.	Idem	2
4. Specific equipment for precision agriculture. 4.1. Equipment for self-propelled machines used in precision agriculture.	Idem	2
4.2. Precision agricultural equipment used for tillage. 4.3. Precision agricultural equipment used for fertilizing.	Idem	2
4.4. Precision agricultural equipment used for sowing and planting.	Idem	2
4.5. Precision agricultural equipment used for phytosanitary treatments.	Idem	2
4.6. Precision agricultural equipment used for harvesting.	Idem	2
4.7. Precision agricultural equipment used for conditioning agricultural products.	Idem	2
5. Aviation equipment used for precision agriculture.	Idem	2
6. Precision animal husbandry equipment. 6.1. Equipment for cattle. 6.2. Equipment for birds.	Idem	2
6.3. Equipment for pigs. 6.4. Equipment for sheep and goats.	Idem	2
7. Romanian contributions in the field of equipment for precision agriculture. 7.1. The Monicult Project. 7.2. The MultiCanSPEC project.	Idem	2
8. Aspects of maintenance of precision agricultural equipment. General conclusions of the course.	Idem	2
Bibliography		
1. Ciocîrlan A., Constantin M. – <i>Asamblarea, întreținerea și repararea mașinilor și instalațiilor</i> , Editura ALL Educational, București, 2002		
2. Donca Gh. – <i>Baza energetică pentru agricultură</i> , Editura Universității din Oradea, 2012		
3. Donca Gh. – <i>Mentenanța utilajelor și instalațiilor agroalimentare</i> , Editura Universității din Oradea, 2011		
4. Donca Gh. – <i>Mașini și instalații zootehnice</i> , Editura Universității din Oradea, 2015		
5. Mariașiu Fl. – <i>Managementul exploatării tehnico-economice a utilajelor și agregatelor agricole</i> , Editura Risoprint, Cluj-Napoca, 2010		
6. Naghiu Al. – <i>Baza energetică pentru agricultură și silvicultură</i> , Editura Risoprint, Cluj-Napoca, 2008		
7. Șandru, A. și colab. – <i>Exploatarea utilajelor agricole</i> , Editura Didactică și Pedagogică, București, 1983		
8. Șandru, A. și colab. – <i>Reducerea consumului de energie prin folosirea rațională a agregatelor agricole</i> , Editura Scrisul românesc, Craiova, 1982.		
9. Qin Zhang – <i>Precision Agriculture Technology For Crop Farming</i> , Washington State University, Taylor & Francis Group, 2016		
<b>8.2 Seminar</b>		
<b>8.3 Laboratory</b>		
	Methods of teaching	No. of hours / Remarks
1. Training on work safety and emergency rules. Presentation of laboratory topics and requirements. The impact of the industrial revolution on agriculture.	Demonstration, experimentation, discussions, problem-solving and teamwork	2
2. Study of software solutions dedicated to precision agriculture.	idem	2
3. Study of monitoring systems for precision agriculture.	idem	2
4. Study of automatic steering equipment for self-propelled machines	idem	2

used in precision agriculture.		
5. Study of equipment for precision fertilization.	idem	2
6. Study of the equipment used for precision sowing and planting.	idem	2
7. Study of precision agriculture equipment used for phytosanitary treatments.	idem	2
8. Study of the equipment used for precision harvesting.	idem	2
9. Study of precision agricultural equipment used for conditioning agricultural products.	idem	2
10. Study of aviation equipment used for precision agriculture.	idem	2
11. Study of precision equipment for cattle and birds.	idem	2
12. Study of precision equipment for pigs, sheep and goats.	idem	2
13. Study of some types of robots made for agriculture.	idem	2
14. Study of integrated information management systems for the maintenance of equipment and machinery for precision agriculture.	idem	2
<b>8.4 Project</b>		

#### Bibliography

1. Donca Gh. – Baza energetică și mașini agricole, Îndrumător de laborator, Editura Universității din Oradea, 2013
2. Donca Gh. – Mașini și instalații zootehnice, Îndrumător lucrări practice de laborator, Editura Universității din Oradea, 2017
3. Donca Gh. – Utilaje și instalații pentru alimentația publică și agroturism, Îndrumător pentru lucrări de laborator, Editura Universității din Oradea, 2013
4. Năstăsioiu M. – Tractoare: determinarea performanțelor de tracțiune și economice, Editura Universității Transilvania, Brașov, 2004
5. Popescu S., Cordoș N. ș. a. – Exploatarea utilajelor agricole. Îndrumător de lucrări practice. Brașov, Lito Universitatea din Brașov, 1986
6. Șandru A. – Exploatarea utilajelor agricole, Îndrumător de lucrări practice, Lito IPTV Timișoara, 1984
7. Tecușan N. – Încercarea și experimentarea tractoarelor și mașinilor agricole, Lito IPTV Timișoara, 1983
8. Tonea C. ș.a. – Baza energetică pentru agricultură, Îndrumător de lucrări practice, Editura Agroprint, Timișoara, 2004

\* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

### **9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme**

The content of the discipline is adapted and satisfies the requirements imposed by the labor market, being agreed by the social partners, professional associations and employers in the field related to the bachelor program. The content of the discipline can be found in the curriculum of the agricultural specialization and from other university centers in Romania that have accredited this specialization, so the knowledge of the basic notions is a stringent requirement of the employers in the field.

### **10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	For the pass mark (5), all subjects	Exam written 2 hours (It consists of	60%

	must treated to the minimum standards. Larger notes are in proportion to the correctness of the fixes.	4 subjects from the course. For the passing of the exam, each subject should treated for minimum 5.).	
10.5 Seminar			
10.6 Laboratory	All laboratory work must done. Recovering only an outstanding laboratory (in the last week of the semester) allowed.	Monitoring the activity and the results obtained.	40%
10.7 Project			
10.8 Minimum standard of performance			
Choosing and operating a machine system chosen so that production technology is sustainable, economically efficient, with a positive ecological and social impact for specific ecological conditions.			

Date of completion

26.09.2020

Signature of course holder

I. PhD. eng. DONCA Gheorghe  
donca.gheorghe@gmail.com

Signature of seminar

laboratory/project holder  
I. PhD. eng. DONCA Gheorghe  
donca.gheorghe@gmail.com

Date of approval in the department

Signature of the Head of Department  
Prof. PhD. eng. BANDICI Gheorghe Emil

Dean signature  
Prof. PhD. eng. CHEREJI Ioan

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