

## 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>Energetic Basis and Agricultural Machinery I</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	I	2.5 Semester	I	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					14
Additional documentation in the library/ on specialised electronic platforms and in the field					7
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					20
Tutorship					1
Examinations					2
Other activities					0
<b>3.7 Total hours of individual study</b>	<b>44</b>				
<b>3.9 Total hours per semester</b>	<b>100</b>				
<b>3.10 Number of credits</b>	<b>4</b>				

### 4. Prerequisites (where appropriate)

4.1 curriculum	
4.2 competences	

**5. Conditions** (where appropriate)

5.1. related to course	
5.2. related to seminar/laboratory/ project	Compliance with Labour Safety and Emergency Standards in laboratory.

**6. Specific competences acquired**

Professional competences	<p>C1.1. Description of the scientific, theoretical and practical fundamentals underpinning the development and application of sustainable agricultural production technologies.</p> <p>C1.3. Apply appropriate methods, techniques and procedures for customizing and optimizing sustainable agricultural production process technologies.</p> <p>C1.4. Qualitative and quantitative analysis of the effects of the technologies used (physico-chemical analyses of the obtained productions, physical, chemical and biological analyses on the environmental components that may be affected by applied agricultural technologies, the use of specific methods for assessing the impact of applied technologies on biodiversity).</p>
Transversal competences	<p>CT1. Elaboration and observance of a work program and accomplishment of its own attributions with professionalism and rigor.</p>

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

7.1 General objective	The course aims to familiarize students with the issues of the energy base and agricultural machinery. The first part summarizes the basics of technical engineering (mechanical and electrical engineering). Students have the opportunity to familiarize themselves with the main types of tractors and machines, the practical skills of construction, sizing, operation and possibilities of their construction, maintenance, operation and repair.
7.2 Specific objectives	Laboratory work is designed to provide future agronomist engineers practical skills in design, development, research, exploitation, repair and maintenance of technical equipment in agriculture. The contents of the presented works are based on the need to deepen the problems presented in the course. Students have the opportunity to identify component parts and to understand the operation of machines and machines, to familiarize themselves with the modern means of measuring their parameters. They will understand their complexity and usefulness and treat them as such. Knowledge is useful in forming skills to address specific production problems faced by one skilled in the art.

**8. Content\*/**

<b>8.1 Course</b>	Methods of teaching	No. of hours / Remarks
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1. Introduction. 1.1. General considerations. 1.2. Recapitulative drawings of technical drawing. 1.3. Materials used in the construction and operation of machinery, equipment and installations in agriculture.	Oral presentation, demonstration and discussions	2
1.4. Manufacture of parts for use in the construction of machinery, equipment and installations. 1.5. Machine parts used in the construction of machinery, equipment and installations	Idem	2
2. Energy sources used in agricultural units. 2.1. Internal combustion engines. 2.1.1. Classification. Theoretical cycle. Power indices. Reduction of pollution.	Idem	2
2.1.2. Components of internal combustion engines.	Idem	2
2.2. Other sources of classical energy (thermal energy, mechanical) used in agriculture. 2.3. Renewable energy sources (wind, solar, geothermal, hydropower and biomass).	Idem	2
2.4. Electricity utilization in machinery and machinery (power generation, transport and distribution, electrical equipment and machines). 2.5. Automation used in agricultural units. 2.6. Hydraulic drive systems used in agriculture	Idem	2
3. Machinery and facilities for water supply and microclimate. 3.1. Installations for water supply. 3.2. Lighting systems. 3.3. Heating installations. 3.4. Ventilation installations. 3.5. Refrigeration installations	Idem	2
4. Tractors. 4.1. Classification of tractors. 4.2. The main parts of the tractors. 4.3. Transmissions used on tractors. 4.4. Tractor clutch	Idem	2
4.5. Tractor gearboxes. 4.6. Rear axle of tractors. 4.7. Work equipment	Idem	2
4.8. Rolling system, 4.9. Braking system. 4.10. Steering mechanism. 4.11. The tractor's electrical installation	Idem	2
5. Machinery for transporting and handling products used in agricultural farms. 5.1. Trailed and self-propelled transport equipment	Idem	2
5.2. Machines and installations for loading - unloading operations	Idem	2
5.3. Transporters with flexible traction. 5.4. Conveyors without flexible traction	Idem	2
6. Machinery and equipment for land improvement.	Idem	2
Bibliography		
1. Blaga V. – <i>Motoare pentru automobile și tractoare</i> , Editura Universității din Oradea, 2007		
2. Blaga V. – <i>Baza energetică pentru agricultură</i> , Editura Universității din Oradea, 2006		
3. Ciocîrlan A., Constantin M. – <i>Asamblarea, întreținerea și repararea mașinilor și instalațiilor</i> , Editura ALL Educational, București, 2002		
4. Donca Gh. – <i>Baza energetică pentru agricultură</i> , Editura Universității din Oradea, 2012		
5. Donca Gh. – <i>Baza energetică și mașini agricole</i> , Îndrumător de laborator, Editura Universității din Oradea, 2013		
6. Donca Gh. – <i>Mic dicționar de inginerie tehnică pentru domeniul agrozootehnic și agroturistic</i> , Editura Universității din Oradea, 2012		
7. Donca Gh. – <i>Bazele utilajelor și instalațiilor pentru alimentația publică și turism</i> , Editura Universității din Oradea, 2009		
8. Donca Gh. – <i>Mentenanța utilajelor și instalațiilor agroalimentare</i> , Editura Universității din Oradea, 2011		
9. Donca Gh. – <i>Utilaje și instalații pentru alimentația publică și agroturism</i> , Editura Universității din Oradea, 2010		
10. Donca Gh. – <i>Mașini și instalații zootehnice</i> , Editura Universității din Oradea, 2015		
11. Dumitru M. – <i>Tractoare agricole</i> , Editura Alma Mater, Sibiu, 2006		
12. Naghiu Al. – <i>Baza energetică pentru agricultură și silvicultură</i> , Editura Risoprint, Cluj-Napoca, 2008		

<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. 1. Basics of machine, machine and plant study. Measuring the size of the parts	Demonstration, experimentation, discussions, problem-solving and teamwork	2
2. Apparatus for measuring electrical and non-electric parameters	idem	2
3. Study of chain transmissions, belt and gear wheels	idem	2
4. Basic elements of electrical drives	idem	2
5. The study of electric machines. Short-circuit three-phase asynchronous motor	idem	2
6. Drawing of characteristic internal curves to axial and centrifugal fans	idem	2
7. Component of hydrostatic drive systems. Analysis of pressure regulating equipment	idem	2
8. Organism of internal combustion piston engines, gas turbines and compressors	idem	2
9. Thermal balances of four-stroke diesel engines	idem	2
10. Determination of the speed characteristics of internal combustion piston engines	idem	2
11. Determination of constructive and functional parameters of tractors	idem	2
12. Transmission and braking study of tractors	idem	2
13. Parameters of tractors working equipment	idem	2
14. Determination of constructive and functional parameters in worm and spiromatic conveyors	idem	2
<b>8.4 Project</b>		
<b>Bibliography</b> 1. Blaga V. – Motoare pentru automobile și tractoare, Editura Universității din Oradea, 2007 2. Blaga V. – Baza energetică pentru agricultură, Editura Universității din Oradea, 2006 3. Ciocîrlan A., Constantin M. – Asamblarea, întreținerea și repararea mașinilor și instalațiilor, Editura ALL Educational, București, 2002 4. Donca Gh. – Baza energetică și mașini agricole, Îndrumător de laborator, Editura Universității din Oradea, 2013 5. Donca Gh. – Baza energetică pentru agricultură, Editura Universității din Oradea, 2012 6. Donca Gh. – Mic dicționar de inginerie tehnică pentru domeniul agrozootehnic și agroturistic, Editura Universității din Oradea, 2012 7. Donca Gh. – Mașini și instalații zootehnice, Îndrumător lucrări practice de laborator, Editura Universității din Oradea, 2017 8. Donca Gh. – Utilaje și instalații pentru alimentația publică și agroturism, Îndrumător pentru lucrări de laborator, Editura Universității din Oradea, 2013 9. Dumitru M. – Tractoare agricole, Editura Alma Mater, Sibiu, 2006 10. Naghiu Al. – Baza energetică pentru agricultură și silvicultură, Editura Risoprint, Cluj-Napoca, 2008 11. Năstăsoiu M. – Tractoare : determinarea performanțelor de tracțiune și economice, Editura Universității Transilvania, Brașov, 2004 12. 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 labour market, being agreed by social partners, professional associations and employers in the field of the bachelor's program. The content of the discipline is found in the curriculum of the agricultural specialization and other academic centres in Romania that have accredited this specialization, so knowing 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 must treated to the minimum standards. Larger notes are in proportion to the correctness of the fixes.	Exam written 2 hours (It consists of 4 subjects from the course. For the passing of the exam, each subject should treated for minimum 5.).	60%
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			
Elaborate and apply economically efficient production technology with positive ecological and social impact depending on specific ecological conditions.			

Date of completion

26.09.2020

Signature of course holder

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Signature of seminar  
laboratory/project holder

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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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