

Josip Juraj Strossmayer University of Osijek
FACULTY OF AGROBIOTECHNICAL SCIENCES OSIJEK

CURRICULUM

University Graduate Study Programme

MECHANIZATION

Academic Year 2022-23

June, 2022

List of Teachers and Courses

Academic year 2022 - 23

University Graduate Study Programme

MECAHNIZATION

A full-time Study Programme

MECHANIZATION

University Graduate Study Programme

I. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
Goran Heffer	Engineering mechanics II	Goran Heffer Ivan Vidaković Goran Pačarek	45				20 10	6
Irena Rapčan	Plant Production - Precise Agriculture	Irena Rapčan Dorijan Radočaj	55			5	15	6
Darko Kiš	Techniques of Processing and Storage II	Darko Kiš Zvonimir Zdunić	45 5	10			5	10 6
Đuro Banaj	Integral Technology in Tillage and Sowing	Đuro Banaj Danijel Jug Miro Stošić Anamarija Banaj	35 5 9				26	6
Ivan Plaščak	Maintenance and repair of agricultural machines II	Ivan Plaščak Tomislav Jurić Željko Barač	30 10 5				30	6
II. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
Željko Barač	Exploitation of Agricultural Machines II	Željko Barač Tomislav Jurić Ivan Plaščak	15 15 5	15		10		15 6
Đuro Banaj	Methodology of testing agricultural machines	Đuro Banaj Anamarija Banaj	50			15 10		6
Luka Šumanovac	Transport in agriculture	Luka Šumanovac Darko Kiš Domagoj Zimmer	35 15 5	10 10				6
Ana Crnčan	Organization and Management of Farms	Ana Crnčan	45				30	6
Tomislav Jurić	Ergonomy of Agricultural Machines	Tomislav Jurić Ivan Plaščak Željko Barač	25 15	5 15			5	10 6

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III. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
	Elective course						6	
	Elective course						6	
	Elective course						6	
	Elective course						6	
IV. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
Andrijana Rebekić	Practical work II	Andrijana Rebekić			75		6	
	Master thesis						30	

ENGINEERING MECHANICS II		
Coordinator	Goran Heffer	
Collaborators	Ivan Vidaković Goran Pačarek	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (45L+30P)
COURSE DESCRIPTION		
Course aims	Introduce students to mechanical quantities and the laws of kinematics of rigid bodies, kinetics of systems and rigid bodies, vibrations, and fluid mechanics. Develop in students the engineering foundations for a scientific approach to the continuation of studies in agricultural mechanization.	
Course enrollment requirements	passed the examination in Engineering Mechanics I	
Intended course learning outcomes		
After successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Analyze the velocities and accelerations of points on a body during translational, rotational, and planar motion of a rigid body. Analyze complex motion of particles and rigid bodies. 2. Explain and calculate work, power, energy, impulse of force, and momentum using examples of driving and operating agricultural machinery. Analyze collisions of particles (bodies) and kinetic moment. 3. Explain and calculate dynamic or mass moments of inertia of simpler bodies. Explain the motion of the system's center of mass, equations of system translation, the equation of rotation of a body around a fixed axis, and equations of planar body motion. Apply these concepts in analyzing the motion of tractor wheel assemblies. 4. Explain the law of kinetic energy and the law of mechanical energy for systems and bodies, the law of momentum, and the law of kinetic moment for systems and bodies. Explain D'Alembert's principle for systems and bodies. Analyze dynamic reactions in supports during the rotation of a body around a fixed axis. 5. Analyze free, damped, and forced vibrations of systems with a single degree of freedom. 6. Explain the basic properties of fluids, concepts, and laws of fluid statics (pressure, Pascal's law, hydrostatic pressure, buoyancy, hydrostatic forces) and fluid dynamics (continuity equation, Bernoulli's equation) for laminar and turbulent flow of viscous fluids in pipes and channels. 		
Assessment and evaluation of student work during classes		
Attendance and participation in lectures and exercises, homework assignments, three partial examinations, and one final written examination. In addition to the time spent in class (75 hours), students are expected to dedicate at least 75 hours to studying the material and completing homework assignments. Final Examination is mandatory.		
Obligatory literature		
1. Vujčić, M.: <i>Inženjerska mehanika II</i> , Poljoprivredni fakultet Osijek 2012/2013. (internal course materials)		
Additional literature		
<ol style="list-style-type: none"> 1. Jecić, S (1994): <i>Mehanika II</i>, tehnička knjiga, Zagreb 2. Stegić, M (1996): <i>Teorija vibracija</i>, Fakultet strojarstva i brodogradnje, Zagreb 3. Pečornik, M (1985): <i>Tehnička mehanika fluida</i>, Školska knjiga, Zagreb 4. Hibbeler, R.C. (2007): <i>Engineering mechanics – Statics & Dynamics</i>, Prentice-Hall, Upper Saddle River, NJ 5. Mott, R.L. (2006): <i>Applied Fluid Mechanics</i>, Pearson Prentice Hall, Singapore 		

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PLANT PRODUCTION—PRECISE AGRICULTURE		
Coordinator	Irena Rapčan	
Collaborators	Dorijan Radočaj	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	L - 55, P - 15, S - 0
COURSE DESCRIPTION		
Course aims	Introduce candidates to advanced use of databases for crop production, as well as the development and application of expert systems in crop production. Candidates will be introduced to key technological factors of modern crop cultivation, especially for crops that are less represented in the crop rotation of the Republic of Croatia and are not covered in undergraduate studies. Furthermore, candidates will also be introduced to the basics of applying geoinformation technologies in crop production, with an emphasis on precision agriculture—agrotechnics in the precision agriculture system (satellite imagery, usage maps, and GPS).	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to:		
<ol style="list-style-type: none">1. describe the fundamentals of crop production, including the general and economic importance of crops, present the classification of plants, and identify and explain the agroecological factors of crop cultivation (specific crop requirements regarding climate conditions and soil);2. describe modern trends in crop cultivation, with particular emphasis on integrated, biodynamic, and organic agriculture;3. interpret the main factors in crop production (agroecological factors). Identify and explain the agrotechnics of arable crops that are less represented in the crop rotation in our country (cereals such as rye, oats, triticale, spelt, sorghum, millet, and buckwheat);4. identify and explain the agrotechnics of industrial and forage crops that are less represented in the crop rotation in our country (e.g., sunflower, oilseed rape, beans, peas, potatoes, clovers, and grasses);5. identify and explain the agrotechnics of vegetable crops that are less represented in the crop rotation in our country (e.g., kale, cauliflower, broccoli, garlic, eggplant, watermelon, artichoke, Jerusalem artichoke, beans, peas). Additionally, describe the agrotechnics for some perennial vegetables and rare vegetable crops from various families;6. describe GIS and its applications in agriculture (historical overview and future prospects), including definitions and concepts, remote sensing, and suitability maps (thematic maps);7. describe global positioning systems and agricultural information technology;8. describe agrotechnical operations within the precision agriculture system (navigation, fertilization, and pest protection); and9. interpret precision agriculture, including nutrient and yield mapping with technical systems such as automatic tractor and machinery guidance in precision agriculture—Farmnavigator.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take partial examinations. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Jurišić M. (2009): <i>AgBase – Priručnik za uzgoj bilja</i>, "1. Tehnologija (agrotehnika) važnijih ratarskih kultura," MPŠVG RH - VIP project VII-5-16/07, Poljoprivredni fakultet, Osijek.		

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2. Jurišić M. (2009): *AgBase – Priručnik za uzgoj bilja*, "II. Tehnologija (agrotehnika) važnijih povrćarskih kultura," MPŠVG RH - VIP project VII-5-16/07, Poljoprivredni fakultet, Osijek.
3. Rapčan Irena (2014): *Priručnik za modul Bilinogojstvo, preddiplomski sveučilišni i stručni studij Mehanizacija*, Poljoprivredni fakultet Osijek.
4. Jurišić M., Plaščak I. (2009): *Geoinformacijski sustavi GIS u poljoprivredi i zaštiti okoliša*, Poljoprivredni fakultet Osijek.
5. Jurišić M., Glavaš J., Plaščak I., Antonić O., Radočaj D. (2021): *Geoinformacijske tehnologije: GIS u ekonomiji*, Fakultet agrobiotehničkih znanosti Osijek.
6. Radočaj D., Jurišić M., Plaščak I. (2021): *Geoinformacijske tehnologije: GIS u poljoprivredi i zaštiti okoliša – Praktikum*, Fakultet agrobiotehničkih znanosti Osijek.

Additional literature

1. Burrough P. A., McDonnell R. A. (2006): *Principles of Geographical Information Systems – Spatial Information Systems and Geostatistics*, Oxford University Press., UK.
2. Todorović J., Lazić B., Komljenović I. (2003): *Ratarsko-povrtarski priručnik*, Laktaši, 2003.

MECHANIZATION

University Graduate Study Program

TECHNIQUES OF PROCESSING AND STORAGE II		
Coordinator	Darko Kiš	
Collaborators	Zvonimir Zdunić	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (50L + 10S +15P)
COURSE DESCRIPTION		
Course aims	Enable graduate students to master the material and acquire knowledge to achieve optimal results in the processing and storage of agricultural products in practice.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. distinguish and apply equipment used in silos;2. calculate the amount of energy required to evaporate one kilogram of water during grain drying;3. solve problems related to grain drying;4. determine the best drying method; and5. differentiate between types of cooling and refrigeration systems.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%) and participation in class activities. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Ritz, Josip (1997): <i>Uskladištavanje ratarskih proizvoda</i>. PBI d.o.o. Zagreb (textbook)2. Babić, Ljiljana; Babić Mirko (2000): <i>Sušenje i skladištenje</i>. Poljoprivredni fakultet, Novi Sad3. Zvonko Katić (1997): <i>Sušenje i sušare u poljoprivredi</i>, Multigraf, Zagreb4. Lovrić, T., Vlasta Piližota (1994.): <i>Konzerviranje i prerada voća i povrća</i>. Nakladni zavod Globus, Zagreb		
Additional literature		
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MECHANIZATION

University Graduate Study Program

INTEGRAL TECHNOLOGY IN TILLAGE AND SOWING		
Coordinator	Đuro Banaj	
Collaborators	Anamarija Banaj Miro Stošić	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	L- 49, P - 26, S – 0,
COURSE DESCRIPTION		
Course aims	The module program Integral Technology in Tillage and Sowing enables students to acquire fundamental theoretical and technical-technological management knowledge about the functioning of machinery and equipment in crop production and their technical-operational characteristics, as a foundational level for their integration and reduction of inputs in tillage and sowing.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. list the basic tasks of technical systems in primary soil tillage and sowing;2. describe the factors influencing the selection of machinery and their compatibility for aggregation;3. identify basic systems and methods for their adjustment;4. differentiate technical systems, their types, and additional equipment;5. select technical systems based on the requirements of the applied cultivation technology; and6. choose and justify (through comparison of technical and operational features) machinery and equipment appropriate to the scale and type of production through calculation.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is written.		
Obligatory literature		
<ol style="list-style-type: none">1. Zimmer, R., Košutić, S., Zimmer, D., Kovačev, I. (2013). <i>Integralna tehnika u obradi tla i sjetvi</i>. Osijek: Sveučilište J. J. Strossmayera u Osijeku.2. Šumanovac, L., Sebastijanović, S., Kiš, D. (2011): <i>Transport u poljoprivredi</i>, Poljoprivredni fakultet u Osijeku, Osijek,3. Zimmer, R., Košutić, S., Zimmer, D. (2009.): <i>Poljoprivredna tehnika u ratarstvu</i>, textbook, Sveučilište J. J. Strossmayera u Osijeku.4. Banaj, Đ., Šmrčković P. (2003): <i>Upravljanje poljoprivrednom tehnikom</i>, Poljoprivredni fakultet, Osijek		
Additional literature		
<ol style="list-style-type: none">1. Banaj, Đ., Tadić, V., Banaj Željka, Lukač., P.(2013): <i>Unapređenje tehnike aplikacije pestiida</i>, Poljoprivredni fakultet u Osijeku, Osijek,2. Lukač, P., Pandurović, T. (2011): <i>Strojevi za berbu voća i grožđa</i>, Poljoprivredni fakultet u Osijeku, Osijek,3. D. Brkić, M. Vujčić, L. Šumanovac, T. Jurić, P. Lukač, D. Kiš, D. Knežević (2005): <i>Eksploatacija poljoprivrednih strojeva</i>, textbook, Poljoprivredni fakultet u Osijeku, Osijek 2005., ISBN 631.316(075.8)		

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University Graduate Study Program

MAINTENANCE AND REPAIR OF AGRICULTURAL MACHINES II		
Coordinator	Ivan Plaščak	
Collaborators	Tomislav Jurić Željko Barač	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (45L + 30P + S)
COURSE DESCRIPTION		
Course aims	Introduce students to the organization and procedures for repairing agricultural machinery, as well as the workshops, tools, and machines used for repairs	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. sketch and interpret an appropriate workshop for agricultural holdings;2. select the necessary tools and equipment for the workshop;3. explain and describe methods for diagnosing and detecting the condition of agricultural machinery;4. identify and present the most common causes and failures of agricultural machinery;5. organize proper management of spare parts; and6. describe the process of regenerating machine components.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, and grades from partial exams. During the semester, students take two partial exams (in the 8th and 15th week of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is oral.		
Obligatory literature		
1. Emert, R., Bukvić, Ž., Jurić, T., Filipović D. (1997): <i>Popravak poljoprivrednih strojeva</i> , university textbook, Poljoprivredni fakultet Osijek		
Additional literature		
the latest scientific and professional papers published in the field of maintenance and repair of agricultural machinery		

MECHANIZATION

University Graduate Study Program

EKSPLOATACIJA POLJOPRIVREDNIH STROJEVA II		
Coordinator	Željko Barač	
Collaborators	Tomislav Jurić Ivan Plaščak Đurđica Kovačić	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (35L + 25P + 15S)
COURSE DESCRIPTION		
Course aims	Introduce students to the factors influencing the rational use of tractors, machinery, and tools in agricultural production	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. study the kinematics of aggregates;2. explain the productivity of tractor-machine aggregates;3. describe the structure and utilization of working time and the performance of aggregates;4. explain methods for determining fuel consumption as well as technical, safety, and aesthetic indicators;5. describe the complex mechanization of technological and transport processes in agriculture;6. compare the level of mechanization of major arable crops;7. explain the management of agricultural machinery based on the principles of precision agriculture; and8. discuss, critically and with reasoned arguments, a given topic related to the operation of agricultural machinery.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, seminar grades, and grades from partial examinations. During the semester, students take two partial examinations (in the 7th and 15th weeks of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Brkić, D., Vujčić, M., Šumanovac, L., Lukač, P., Kiš, D., Jurić, T., Knežević, D. (2005): <i>Eksploatacija poljoprivrednih strojeva</i>, university textbook, Osijek;2. the latest papers published in the field of agricultural machinery operation		
Additional literature		
<ol style="list-style-type: none">1. Banaj, Đ., Šmrčković, P. (2003): <i>Upravljanje poljoprivrednom tehnikom</i>, university manual, Osijek.2. Beštak, T. (1986): <i>Eksploatacija poljoprivrednih oruđa</i>, FPZ, Zagreb.3. Lazić, V. (1983): <i>Teorijske osnove eksploatacije poljoprivredne tehnike</i>, Poljoprivredni fakultet Novi Sad.4. Mičić, J. (1981): <i>Poljoprivredne mašine i uređaji</i>, Poljoprivredni fakultet Zemun.		

MECHANIZATION

University Graduate Study Program

METHODOLOGY OF TESTING AGRICULTURAL MACHINES		
Coordinator	Đuro Banaj	
Collaborators	Anamarija Banaj	
Study year and semester	1st year , 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	P- 50, V - 25, S – 0
COURSE DESCRIPTION		
Course aims	Introduce students to the importance of testing agricultural machinery, as well as familiarize them with regulations and standards. Cover the organization of testing, measurement methods, data processing, comparison, and presentation. Examine testing methods for power machinery and engines in laboratory and operational conditions. Explore strategies for testing agricultural machinery in crop production according to European Union regulations.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. list the basic tasks of technical systems on agricultural machinery;2. describe the factors influencing the proper functioning of individual systems;3. identify basic methods for testing agricultural machinery; and4. distinguish and interpret obtained measurement results for technical systems, types, and additional equipment. Select technical systems based on testing results for the application of specific cultivation technologies.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is written.		
Obligatory literature		
<ol style="list-style-type: none">1. Banaj, Đ., Tadić, V., Banaj Željka, Lukač., P. (2013): <i>Unapređenje tehnike aplikacije pesticida</i>, Poljoprivredni fakultet u Osijeku, Osijek;2. Lukač, P., Pandurović, T. (2011): <i>Strojevi za berbu voća i grožđa</i>, Poljoprivredni fakultet u Osijeku, Osijek;3. Zimmer, R., Košutić Ć, S., Zimmer, D. (2009.): <i>Poljoprivredna tehnika u ratarstvu</i>, textbook Sveučilište J. J. Strossmayera u Osijeku;4. Banaj, Đ., Šmrčković P. (2003): <i>Upravljanje poljoprivrednom tehnikom</i>, Poljoprivredni fakultet, Osijek;5. standards (ASAE, HRN, and ISO, EU-EN, EN 13790 I and II) in the field of agricultural machinery; and6. Mirko Vuković (2006); <i>Međunarodni sustav jedinica SI</i>, 8 izdanje, Državni zavod za mjeriteljstvo.		
Additional literature		
<ol style="list-style-type: none">1. D. Brkić, M. Vujčić, L. Šumanovac, T. Jurić, P. Lukač, D. Kiš, D. Knežević (2005): <i>Eksploatacija poljoprivrednih strojeva</i>, textbook, Poljoprivredni fakultet u Osijeku, Osijek 2005., ISBN 631.316(075.8);2. Ercegović, Đ., Raičević, D.(2003): <i>Mehanizmi poljoprivrednih mašina</i>, Poljoprivredni fakultet Univerziteta u Beogradu, Beograd		

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TRANSPORT IN AGRICULTURE		
Coordinator	Luka Šumanovac	
Collaborators	Darko Kiš Domagoj Zimmer	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (40P + 20V +15S)
COURSE DESCRIPTION		
Course aims	introduce students to the technical and technological characteristics of transport vehicles and their use in agricultural production	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. describe in detail the physical and mechanical properties of materials and the characteristics of goods transported in agriculture;2. explain the working principle and main components of external and internal transport vehicles;3. calculate key operational indicators of external and internal transport vehicles;4. implement the rational use of integrated transport in agriculture;5. develop a database and optimize the number of transport vehicles for a specific production unit;6. create models for planning and managing transport systems; and7. prepare and present a given topic in the field of external and internal transport vehicles in agriculture.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take two partial examinations (in the 6th and 12th weeks of classes). Students are also required to prepare and defend a seminar paper in the 13th week of classes. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination can be oral or written."		
Obligatory literature		
<ol style="list-style-type: none">1. Šumanovac, L., Sebastijanović, S., Kiš, D.: <i>Transport u poljoprivredi</i>, Poljoprivredni fakultet u Osijeku, Osijek, 2011 (university textbook);2. Šumanovac, L.: <i>Transport u poljoprivredi</i>, Poljoprivredni fakultet u Osijeku, Osijek-Vinkovci, 2001. (internal course materials); and3. scientific and professional papers published in reputable international journals to be used for seminar preparation.		
Additional literature		
<ol style="list-style-type: none">1. Babić, Ljiljana, Babić, M.: <i>Sušenje i skladištenje</i>, Poljoprivredni fakultet u Novom Sadu, Novi Sad, 2000;2. Kurth, F.: <i>Grundlagen der Fördertechnik</i>, VEB Technik Verlag, Berlin, 1987;3. Mührel K.: <i>Transport, Umschlag, Lagerung</i>, VEB Verlag, Technik, Berlin, 1983; and4. Serdar, J.: <i>Prenosila i dizala</i>, Tehnička knjiga, Zagreb, 1973.		

MECHANIZATION

University Graduate Study Program

ORGANIZATION AND MANAGEMENT OF FARMS		
Coordinator	Ana Crnčan	
Collaborators	–	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (45L + 30P)
COURSE DESCRIPTION		
Course aims	equip students with the skills to properly select and use mechanization tools and other production factors for the efficient organization of tasks in specific agricultural production lines, with the goal of increasing labor productivity while achieving economical and profitable production	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. describe the concept of organization, the forms of companies under the Companies Act, family farms, their business functions, and organizational structure;2. explain data related to the organization of land holdings, buildings, machinery and equipment, land improvements and roads, livestock, and plantations; analyze the relationships within and between individual production factors;3. calculate the optimal level of investment intensity based on raw material and finished product prices;4. standardize the performance of mobile field aggregates during operations and plan the consumption of raw materials and auxiliary materials needed for creating a technological map of specific production lines;5. plan costs for fuel, oil, depreciation, maintenance, storage, insurance, interest, labor, and machinery operation, as well as calculate the cost per hour of aggregate operation and the cost of machinery use per hectare; and6. develop an information system for maintaining records of work processes and creating planning calculations; propose machinery and equipment procurement, assess the justification of investments, and analyze farm operations.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, seminar grades, and grades from partial examinations. During the semester, students take two partial examinations (in the 7th and 15th weeks of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Sikavica, P. (2011.): <i>Organizacija</i>, Školska knjiga, Zagreb.2. Karić, M. (2002.): <i>Kalkulacije u poljoprivredi</i>, Poljoprivredni fakultet u Osijeku, Osijek.		
Additional literature		
<ol style="list-style-type: none">1. Lacković, Z. (2004.): <i>Management malog poduzeća</i>, Elektrotehnički i Građevinski fakultet Sveučilišta Josipa Jurja Strossmayera u Osijeku i Veleučilište u Požegi, Osijek.2. Zakon o trgovačkim društvima, https://www.zakon.hr/z/546/Zakon-o-trgova%C4%8Dkim-dru%C5%A1tvima.3. Pravilnik o utvrđivanju sukladnosti traktora za poljoprivredu i šumarstvo, https://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_80_1694.html.4. Uredba o obrascu i načinu vrednovanja gospodarskog programa korištenja poljoprivrednog zemljišta u vlasništvu Republike Hrvatske, https://narodne-novine.nn.hr/clanci/sluzbeni/2016_09_79_1799.html		

MECHANIZATION

University Graduate Study Program

ERGONOMY OF AGRICULTURAL MACHINES		
Coordinator	Tomislav Jurić	
Collaborators	Ivan Plaščak Željko Barač	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (40L + 15P + 20S)
COURSE DESCRIPTION		
Course aims	Introduce candidates to ergonomic requirements for tractors and agricultural machinery	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. describe the workloads to which the operator is exposed during work;2. describe ergonomic requirements concerning: access to the workstation, size of the workspace, body posture during work, suitability of handling controls (manual and foot), mechanical vibrations, noise, microclimate, dust, harmful substances, visibility conditions, operator information about the condition of the tractor and attached machinery, visibility of measuring devices and instruments, and adaptability of the tractor for use with attached machinery;3. explain the negative impact of workloads on the operator;4. describe design solutions for reducing the negative effects of factors to which the operator is exposed during work;5. propose protective measures for the operator against negative effects encountered during work;6. conduct noise level measurements and process the obtained data; and7. discuss, with reasoned and critical arguments, a given topic in the ergonomics of agricultural machinery.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of evaluation points. Evaluation points are earned based on class attendance (minimum 70%), participation in class activities, seminar grades, and grades from partial examinations. During the semester, students take two partial examinations (in the 7th and 15th weeks of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a positive overall grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Dupuis, H. (1981): <i>Gestaltung von Schleppern und landwirtschaftlichen Arbeitsmaschinen</i>, Köln;2. Göhlich, H. (1987): <i>Lehrbuch der Agrartechnik, Band 5 - Mensch und Maschine</i>, Hamburg and Berlin.3. Kroemer, K.H.E., Grandjean, E.(2000): <i>Prilagodavanje rada čovjeku, Ergonomski priručnik</i>, Naklada Slap;4. Lazić, V.(1983): <i>Teorijske osnove eksploatacije poljoprivredne tehnike</i>, Poljoprivredni fakultet Novi Sad; and5. the latest papers published in the field of agricultural machinery ergonomics.		
Additional literature		
<ol style="list-style-type: none">1. Krichner, J. H., Baum, E. (1990): <i>Ergonomie für Konstrukteure und Arbeitsgestalter</i>, Munich.		

MECHANIZATION

University Graduate Study Program

PRACTICAL WORK II		
Coordinator	Andrijana Rebekić	
Collaborators	–	
Study year and semester	2nd year, 3rd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (60P + 15S)
COURSE DESCRIPTION		
Course aims	Introduce candidates to the adjustment of machines and devices in the workshop and in the field, as well as training them for the practical execution of agrotechnical operations in agricultural production. The content enables participants to gain detailed knowledge of machines and devices, including their design, components, adjustments during operation, and applications. Practical maintenance and repair of power and attachment units.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. use internal combustion engines (ICEs) and power units efficiently in agricultural production;2. perform key practical adjustments in the field according to agrotechnical operations and operate machinery for primary and secondary soil tillage, fertilization, sowing, planting, crop care and protection, haymaking, silage preparation, harvesting of grain crops, corn harvesting and shelling, and sugar beet harvesting;3. describe maintenance and repair procedures and methods for various systems on tractors and agricultural machinery;4. select the optimal type of storage and economic yard suitable for the quantity and type of produced goods;5. create a database and optimize the number of transport vehicles for a specific production unit. Use various methods to test power and implement aggregates;6. manage agricultural machinery based on the principles of precision agriculture and ergonomic standards;7. organize and oversee the operation of agricultural machinery on farms; and8. demonstrate practical knowledge and skills in the operation of power units and attached tools.		
Assessment and evaluation of student work during classes		
Students are expected to attend classes regularly and actively participate in tasks during exercises and practical work. During the semester, in accordance with the schedule and agrotechnical operations, students will complete professional practice on family farms and other business entities in the Republic of Croatia. During the professional practice, students are required to maintain a practice journal. After completing the exercises and practical work, students will take a written exam for which they will receive a descriptive grade. Students are advised to take notes during their professional practice and prepare for the exam using the required literature.		
Obligatory literature		
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Additional literature		
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