

# Agricultural Mechanical Engineering

**The aim of the program Agricultural Mechanical Engineering** is to provide fundamental knowledge in the field of mechanical engineering and related fields, forming the basis of engineering competence, to develop skills in mechanical engineering studies and / or professional activities solving complex and unpredictable professional or learning problems, to work innovatively in agriculture and related fields, to develop a personality's worldview, critical thinking and the formation of a member of civil society capable of self - improvement of knowledge and skills.

Description of learning outcomes <sup>1</sup>	Intended learning outcomes of the Programme	Study courses of the Programme
Knowledge, their application	<b>According to the target groups of the study program subjects:</b> Acquiring effective and flexible use of language for social and professional purposes through the acquisition of linguistic, socio-cultural and intercultural knowledge.	Language, Foreign Speciality Language
	for the realization of the theoretical foundations of engineering sciences and the principles of their application	Analytical Geometry and Calculation, Integrals, Differential Equations and Lines, Applied Mathematics, Physics I, Physics II, Chemistry, Engineering Graphics, Information Technology, Human Safety, Thermodynamics, Theoretical Mechanics, Materials Science, Materials Technology, Strength of Materials, Computer Aided Design, Fluid Mechanics, Electrotechnics, Electronics and automatic control, Mechatronics, Technological practice.
	to design, manufacture, operate, service machines and / or their elements (main subjects of the study field);	Machine Elements And Replaceability, Theory of mechanisms and machines, Quality control, Machinery Manufacturing And Repair Bases, Triboengineering Transporter Machinery, Internal combustion engines, Tillage technologies, Technology of Machinery Service, Engineering of Animal Husbandry Technologies

	for the implementation of agro- and ecotechnologies, agricultural machinery and equipment constructions, purpose, work and selection principles (basics of the study program)	Basics of agronomy and ecology, Transport and power machinery, Electronics and automatic control, Technological transport, Internal combustion engines, Tillage technologies, Crop Harvesting Machinery, Engineering of Animal Husbandry Technologies, Technical training practice of Agricultural Engineering
	for the evaluation of economic indicators of economic enterprises and managerial-legal aspects of their activity (social science subjects)	Engineering Economics, Management, Fundamentals of Law
	According to the chosen specialization of study: Agromechatronics / Engineering design / Machine production / Machine service, graduates knowledge:	
	operation of mechatronic systems; efficient use of precision farming technologies and tools;	<u>1. Mechatronic systems, Maintenance and diagnostics of mechatronic systems, Precision Farming, Engineering - design practice, FW.</u>
	methods of engineering design and modeling of machines and their elements for realization;	<u>2. Computer analysis of Constructions, Dynamics of mechanics systems, Fundamentals of construction and modeling of agricultural machinery and equipment, Engineering - design practice, FW.</u>
	for the analysis of the causes of changes in the technical condition of machines and the use of regularities, the efficient use of CNC equipment management, production technology equipment	<u>3. Basics of Mechanical Processing Programing, Reliability of machines, Technological devices and equipment, Engineering - design practice, FW.</u>
	effective use of mechatronic systems, diagnostic methods and tools, machine repair technologies in service.	<u>4. Machine mechatronic systems, Machinery diagnostics, Machine repair technologies, Engineering - design practice, FW.</u>
Ability to carry out the research	Ability to collect and analyze data necessary for solving important scientific problems of mechanical engineering, professional problems in the field of agricultural mechanical engineering, using the achievements and methods of basic and applied research: - to monitor and measure quantitative and qualitative physical or other properties, analyze and evaluate changes ; - to apply theoretical knowledge of basic engineering, information technologies, to carry out research in the field of study; - to apply and combine knowledge from different fields in order to achieve a rational combination of environmental, human, technical and technological factors.	Analytical Geometry and Calculation, Integrals, Differential Equations and Lines, Applied Mathematics, Physics I, Physics II, Chemistry, Engineering Graphics, Information Technology, Human Safety, Thermodynamics, Theoretical Mechanics, Materials Science, Materials Technology, Strength of Materials, Computer Aided Design, Fluids Mechanics, Electrotechnics, Electronics and automatic control, Mechatronics, Basics of agronomy and ecology, Transport and power machinery, Internal combustion engines, Tillage technologies, Engineering of Animal Husbandry Technologies, Mechatronic systems, Machinery elements and Replaceability, Theory of mechanisms and machines,

		Quality control, Machinery Manufacturing and Repair Bases, Tribotechnics, Internal combustion engines, Tillage technologies, Crop Harvesting machinery, Technologies of Machine service, Engineering of Animal Husbandry Technologies.
Specific abilities	Ability to plan, organize, carry out and evaluate activities in the context of professions and studies, independently choosing complex technological, organizational and methodological tools. Ability to apply general calculation and design knowledge and methods to solve engineering issues:	
	Designing the elements of agricultural machinery, preparing production technologies, carrying out production	Strength of Materials, Computer aided design, Machine elements and Replaceability, Mechanics and machine theory, Machinery Manufacturing And Repair Bases, Transportation Machinery, Internal combustion engines, Tillage technologies, Crop Harvesting machinery, Technologies of Machine service, Engineering of Animal Husbandry Technologies, Final work
	anticipating and applying effective engineering solutions in the management of agricultural technologies, technical measures and optimizing their work	Basics of agronomy and ecology, Transportation Machinery, Internal combustion engines, Tillage technologies, Crop Harvesting machinery, Machine service technologies, Engineering economics, Management.
	selecting production technologies and equipment (agricultural, transport and power, stationary technology, etc.), to operate them properly, to optimize operating costs, to plan the need for and utilization of machinery	Basics of agronomy and ecology, Machinery Manufacturing And Repair Bases, Transportation Machinery, Internal combustion engines, Tillage technologies, Crop Harvesting machinery, Machine service technologies, Precision Farming, Basics of Mechanical Processing Programing, Technological plant and equipment, Vehicles, Technology practice, Engineering - design practice, Final work
	According to the chosen study specialization: Agromechatronics / Engineering design / Machine production / Machine service, graduates are able to:	
	to evaluate, analyze and select mechatronic systems and their diagnostic tools; precision farming technologies;	<u>1. Mechatronic systems, Maintenance and diagnostics of mechatronic systems, Precision Farming, Engineering - design practice;</u>
	- to create and study dynamic models of mechanical systems; to construct and to model the work of agricultural machinery working parts;	<u>2. Computer analysis of Constructions, Dynamics of mechanical systems, Machinery and Equipment Design And Simulation Essential, Engineering - design practice;</u>

	<p>- to preparecontrolling guidelines of CNC machine; select the necessary equipment; to evaluate the reliability of machines, to choose methods and means to increase reliability;</p> <p>- to analyze and evaluate the mechatronic systems of machines, to select and be able to use diagnostic tools, to analyze and be able to rationally use repair technologies.</p>	<p><u>3. Basics of Mechanical Processing Programing, Machine Reliability, Technological Plant and Equipment, Engineering - Design Practice;</u></p> <p><u>4. Mechatronic systems of machines, Machine diagnostics, Machine repair technologies, Engineering - design practice;</u></p>
Social skills	Ability to communicate with specialists and the public in solving the tasks of professional activity or field of study, presenting the performed activity and its results. Takes responsibility for the quality of one's own and subordinates' activities and evaluates them in accordance with professional ethics and citizenship. Able to transfer knowledge and understanding of the field of study and activity to professionals and other learners. Creative, tolerant, open to the world, a member of civil society responsible for actions and decisions.	All study subjects
Personal skills	Able to study independently and plan the learning process and professional activities in the field of agricultural mechanical engineering. Understands moral responsibility for the impact of its activities and its results on social, economic, cultural development, well-being and the environment.	All study subjects

Semester	Study subject	ECTS
I	<i>Field study subjects (including 20 ECTS for elective studies)</i>	
	MFITB028, Mathematic 1, C	6
	MEAEB160, Chemistry, C	4
	MFITB073, Phisic 1, C	4
	IFJTB082, Introduction to studies (and 1 credit for workshop), C	3
	VŽHSB001, Engineering graphics, C	3
	<b>Total per semester:</b>	<b>20</b>

Semester	Study subject	ECTS
II	<i>General academic study subjects</i>	
	KEKAB, Foreign Language of Speciality 1, A	6
	<i>Field study subjects (including 14 ECTS for elective studies)</i>	
	MFITB017, Mathematic 2, C	6
	IFISB001, Theoretical Mechanics (static, kinematic), C	4
	MFITB037, Information Technologies, C	4
	<b>Total per semester:</b>	20
Semester	Study subject	ECTS
III	<i>Field study subjects (including 13 ECTS for elective studies)</i>	
	MFITB073, Phisic 2, C	4
	IFISB070, Computer – Aided Drawing, C	3
	VŽHSB001, Theoretic Mechanics and Technical Measurement, C	6
	<i>Other study subjects (including 8 ECTS for elective studies)</i>	
	Elective subject of Study, 8 cr.	
	<b>A group subject</b>	4
	<b>B group subject</b>	4
	<b>Total per semester:</b>	21
Semester	Study subject	ECTS
IV		
	MAT1025, Basics of Statistics, C	3
	IFEBB006, Electrotechnics, C	4
	IFJTB032, Materials science and materials technologies, C	6
	<i>Other study subjects (including 6 ECTS for elective studies)</i>	
	Foreign Language of Speciality 2, A	6

	<b>Total per semester:</b>	19
<b>Semester</b>	<b>Study subject</b>	<b>ECTS</b>
V	<i>Field study subjects (including 13 ECTS for elective studies)</i>	
	VŽHSB081, Strength of Materials, C	3
	IFEBB167, Thermodynamics, C	4
	IFISB004, Theory of Mechanisms and Machines, C	6
	<i>Other study subjects (including 8 ECTS for elective studies)</i>	
	<b>A group subject</b>	4
	<b>B group subject</b>	4
	<b>Total per semester:</b>	21
<b>Semester</b>	<b>Study subject</b>	<b>ECTS</b>
VI		
	IFJTB033, Computer-Aided Design, C	4
	IFISB047, Machine Elements and Replaceability, C	6
	IFISB082, Course Project, C (associated with Computer-Aided Design and Machine Elements and Replaceability)	2
	<i>Other study subjects (including 8 ECTS for elective studies)</i>	
	<b>A group subject</b>	4
	<b>B group subject</b>	4
	<b>Total per semester:</b>	20
<b>Semester</b>	<b>Study subject</b>	<b>ECTS</b>
VII	<i>Field study subjects (including 16 ECTS for elective studies)</i>	
	EVEAB527, Engineering Economics, C	4
	IFJTB001, Fluid Mechanics, C	4
	IFJTB008, Machines Mechatronics Systems, C	4
	IFEBB017, Electronics And Automatic Control, C	4

	<i>Other study subjects (including 4 ECTS for elective studies)</i>	
	<b>A group subject</b>	4
	<b>Total per semester:</b>	20
<b>Semester</b>	<b>Study subject</b>	<b>ECTS</b>
VIII	<i>Field study subjects (including 22 ECTS for elective studies)</i>	
	IFEBB007, Transporter Machinery, C	3
	IFJTB003, Internal Combustion Engines, C	6
	KEKAB010, Language of Speciality, C	3
	IFJTB109, Project Activity Practice, C	10
	<b>Total per semester:</b>	22
<b>Semester</b>	<b>Study subject</b>	<b>ECTS</b>
IX	<i>Field study subjects (including 19 ECTS for elective studies)</i>	
	IFJTB105, Manufacture of agricultural machinery, C	6
	IFJTB 106, Course Project, C	2
	IFJTB004, Transport and Power Machinery, C	4
	IFISB081, Tillage and Crop Care Technologies, C	4
	AFADB005, Basics of Agronomy And Ecology, C	3
	<b>Total per semester:</b>	19
<b>Semester</b>	<b>Study subject</b>	<b>ECTS</b>
X	<i>Field study subjects (including 16 ECTS for elective studies)</i>	
	IFISB006, Crop Harvesting Machinery, C	6
	IFEBB079, Engineering of Animal Husbandry Technologies, C	4
	IFISB075, Machine Control Systems, C	6
	<i>Other study subjects (including 4 ECTS for elective studies)</i>	
	Alternatyve subject (1)	4
	<b>Total per semester:</b>	20

Semester	Study subject	ECTS
XI	<i>Field study subjects (including 11 ECTS for elective studies)</i>	
	IFISB011, Human Safety, C	4
	IFISB090, Quality Control, C	3
	IFJTB059, Technology of Machinery Service, C	4
	<i>Other study subjects (including 8 ECTS for elective studies)</i>	
	Alternatyve subject (2)	4
	Alternatyve subject (3)	4
	<b>Total per semester:</b>	19
Semester	Study subject	ECTS
XII	IFJTB108, Project Activity Practice, C	5
	IFBDB001, Final Work, C	15
	<b>Total per semester:</b>	20
Set of Alternatyve Subjecs (12 cr.)		
<b>1. Engineering of Machinery Service</b>		
X	IFJTB107, Triboengineering and Reliability of machinery, C	4
	IFJTB079, Machine repair technologies, C	4
XI	IFJTB078, Machinery Diagnostics, C	4
<b>2. Systems of Precise Farming</b>		
X	IFISB077, Data Analysis, C	4
	IFISB076, Agricultural Robots, C	4
XI	IFISB078, Intelligent Machinery for Precision Agriculture, C	4
Alternatyves Totaly		14
<b>Total in programme:</b>		240
<b>Faculty of Engineering</b> <b>Group of Fields of Study</b> Engineering Sciences <b>Lenght of the Programme</b> 4 years <b>ECTS credits</b> 240 <b>Name of the Qualification</b> Bachelor of Engineering Sciences		



<b>Contacts</b>

**Faculty of Engineering**

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