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STUDY PROGRAMME MECHATRONICS AND ROBOTICS

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AIMS of STUDY PROGRAMME



1. To deliver knowledge of mathematics and nature sciences, necessary for specialist of industrial engineering, able to design, produce and exploit mechatronic and robotic systems
2. To bring fundamentals of theoretical knowledge in area of special technological sciences and build practical skills, necessary for collecting, analyzing and understand information of industrial engineering area. To learn operate with production systems, understand and be able to evaluate main quantity and quality parameters of such systems; identify problems, perform practical research.



AIMS OF STUDY PROGRAMME



3. To deliver special knowledge and develop ability to analyze and solve problems of industrial engineering, be interested in advances of mechatronics and robotics; independently implement it in practical activity.
4. To develop ability to improve professional competence due to life-long learning. To develop ability understand influence of engineering solutions and its importance to society development.



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RESULTS of STUDY PROGRAMME

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Knowledge



1. Knowledge of mathematics: terms, laws, theory, mathematical analysis, differential calculus, differential equations, linear algebra, numerical algebra, complex numbers, theory of probability, statistics.
2. Fundamental knowledge about Natural sciences and their laws.
3. Humanitarian and social knowledge in order to develop philosophy, enhance erudition and enable to reach engineering purpose.
4. Special knowledge on technological sciences and industrial engineering.
5. Knowledge about structure of mechatronic systems, their design production and control, ensuring quality of systems and their proper maintaining.
6. Knowledge about structure of robotic systems, their design production and control, ensuring quality of the systems and their proper maintaining.



Ability to research

1. Implementing achievements and methods of mathematics and nature sciences to solve problems of engineering.
2. Understand newest engineering technologies, recognize and analyse implementation and utilization possibilities.
3. Interpretation results, sort data by its importance in order to perform design, control, production and technical maintenance of mechatronic and robotic systems.
4. Abilities to understand advantages and disadvantages of chosen materials, processes and technologies. Ability to apply experimental methods.



Engineering Analysis



1. Adjusting theory and practical skills; performing laboratory and experimental research.
2. Analyzing problematic situations and finding alternative ways of such task solution, understanding consequences of solution to environment and society welfare.
3. Ability to perform analysis of separate, complex and parenthetic mechatronic systems and evaluation of parameters.
4. Ability to analyze, diagnose and forecast damages, compound and parenthetic robotic systems.
5. Ability to analyse various methods of construction joints, used and estimated to use construction materials.



Engineering Skills



1. Ability to combine theory and practice elements in solving engineering problems
2. Ability to assess the situation and take right engineering solutions
3. Ability to evaluate shape of mechatronic system by performing diagnostic and troubleshooting
4. Ability to control existing robotic systems, to choose right components, to prepare them for manufacturing by programming and combining reciprocity of mechanisms
5. To evaluate and choose correct materials for equipment and products



CURRICULUM



Semester	Course Title	ECTS Credits	Hours/semester
1	Chemistry	6	45
	Physics 1	6	60
	Programming C	3	45
	Mathematics 1	6	60
	Introduction to Mechatronics and Robotics	3	30
	Human's Safety and Environmental Protection	3	45
	Law	3	30



CURRICULUM



Semester	Course Title	ECTS Credits	Hours/semester
2	General Engineering Graphics	6	60
	Physics 2	3	45
	Materials Science 1	3	45
	Mathematics 2	6	60
	Engineering Mechanics	6	60
	Management	3	45
	Cognitive Practice	3	15



CURRICULUM

Semester	Course Title	ECTS Credits	Hours/semester
3	Fluid Mechanics and Thermodynamics	3	45
	Applied Engineering Graphics	3	45
	Materials Science 2	3	45
	Mathematics 3	6	60
	Theory of Mechanisms and Machines (with course project)	9	90
	Foreign Language	3	30
	Ethics/Formal Language (<i>free choice</i>)	3	30



CURRICULUM

Semester	Course Title	ECTS Credits	Hours/semester
4	Electrical Engineering	3	45
	C++ Programming Language	6	60
	Machine Elements (with course project)	6	60
	Elements of Mechatronics	3	45
	Mechanics of Materials	6	60
	Speciality Foreign Language	3	30
	<i>Free choice</i>	3	30



CURRICULUM



Semester	Course Title	ECTS Credits	Hours/semester
5	Electronics	3	45
	Automatic Control Systems (with course project)	6	60
	Electric Drives	3	45
	Theory and Practice of Measurements (with course project)	6	60
	Robotics	6	60
	Mechatronic Systems 1	3	45
	Philosophy of Technology/Politics and Technology (<i>Free choice</i>	3	30



CURRICULUM

Semester	Course Title	ECTS Credits	Hours/semester
6	Materials in Mechatronics	3	45
	CAD/CAM/CAE	6	60
	Mechatronic Systems 2	6	60
	Robotical Technology	6	60
	Fundamentals of Economics (with course work)	6	45
	<i>Free choice obligatory course</i>	3	45



CURRICULUM



Semester	Course Title	ECTS Credits	Hours/semester
7	Digital Automatics (with course project)	6	50
	Specific Purpose Language Culture	3	30
	Career Internship	12	0
	Bachelor Graduation Thesis 1	3	0
	Design of Mechatronic and CAD/CAM Systems. Integrated Project	6	30



CURRICULUM



Semester	Course Title	ECTS Credits	Hours/semester
8	Industrial Logical Controllers	3	36
	Design of Mechatronic and Robotic Systems (with course project)	6	48
	Quality and Certification in the Automated Industry	6	48
	Bachelor Graduation Thesis 2	6	0
	Bachelor Graduation Thesis 3	9	0



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QUESTIONS

THANK YOU FOR ATTENTION

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