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MECHAUZ

STUDY PROGRAMME MECHATRONICS AND ROBOTICS

Vilnius Gediminas Technical University

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AIMS of STUDY PROGRAMME

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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.

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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

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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.

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Ability to research

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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.

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Engineering Analysis

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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.

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Engineering Skills

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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

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CURRICULUM

1 semester 15 weeks (teaching course) + 4 weeks (session) + 1 weeks (Independent Work) = 20 weeks					
Curse title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Chemistry	30	15	00	04	6
Physics 1	30	15	15	04	6
Programming C	30	15	00	02	3
Mathematics 1	30	15	15	04	6
Introduction to Mechatronics and Robotics	30	00	00	02	3
Human's Safety and Environmental Protection	30	15	00	02	3
Law	30	00	00	02	3
Total:	**315**				**30**

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CURRICULUM

2 semester 15 weeks (teaching course) + 4 weeks (session) + 1 weeks (Independent Work) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Physics 2	15	15	30	04	3
General Engineering Graphics	15	15	30	04	6
Mathematics 2	30	15	15	04	6
Materials Science 1	30	15	00	02	3
Engineering Mechanics	30	00	30	04	6
Management	30	00	15	02	3
Cognitive Practice	00	00	15	02	3
Total:	**330**				**30**

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CURRICULUM

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3 semester 15 weeks (teaching course) + 4 weeks (session) + 1 weeks (Independent Work) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Fluid Mechanics and Thermodynamics	15	15	15	02	3
Applied Engineering Graphics	15	15	15	02	3
Mathematics 3	30	15	15	04	6
Materials Science 2	30	15	00	02	3
Theory of Mechanisms and Machines (with course project)	45	15	30	06	9

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Option (one of the following)					
English Language	00	00	30	02	3
German Language	00	00	30	02	3
French Language	00	00	30	02	3
Option (one of the following)					
Ethics	30	00	00	02	3
Formal Writing	15	00	15	03	3
Total:	**345**				**30**

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4 semester 15 weeks (teaching course) + 4 weeks (session) + 1 weeks (Independent Work) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Electrical Engineering	30	15	00	02	3
C++ Programming Language	30	30	00	04	6
Machine Elements (with course project)	30	15	15	04	6
Elements of Mechatronics	30	15	00	02	3
Mechanics of Materials	30	15	15	04	6

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Option (one of the following)					
Speciality English Language	00	00	30	02	3
Speciality German Language	00	00	30	02	3
Speciality French Language	00	00	30	02	3
Free choice obligatory course	–	–	–	–	3
Total:	**300**				**30**

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5 Semester 15 weeks (teaching course) + 4 weeks (session) + 1 weeks (Independent Work) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Electronics	30	15	00	02	3
Automatic Control Systems (with course project)	30	15	15	04	6
Electric Drives	30	15	00	02	3
Theory and Practice of Measurements (with course project)	30	15	15	04	6
Robotics	30	15	15	04	6
Mechatronic Systems 1	30	00	15	02	3
Option (one of the following)					
Philosophy of Technology	30	00	00	02	3
Politics and Technology	30	00	00	02	3
Total:	**345**				**30**

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6 semester 15 weeks (teaching course) + 4 weeks (session) + 1 weeks (Independent Work) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Materials in Mechatronics	30	15	00	02	3
CAD/CAM/CAE	30	00	30	04	6
Mechatronic Systems 2	30	00	30	04	6
Robotical Technology	30	15	15	04	6
Fundamentals of Economics (with course work)	30	00	15	04	6
Free choice obligatory course	–	–	–	–	3
Total:	270				30

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7 Semester 10 weeks (teaching course) + 2 weeks (session) + 8 weeks (practice) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Digital Automatics (with course project)	20	10	20	04	6
Specific Purpose Language Culture	20	00	10	02	3
Career Intenship	00	00	00	00	12
Bachelor Graduation Thesis 1	00	00	10	02	3
Design of Mechatronic and CAD/CAM Systems. Integrated Project	00	00	30	04	6
Total:			**120**		**30**

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8 Semester 12 weeks (teaching course) + 2 weeks (session) + 6 weeks (final thesis) = 20 weeks					
Course title	Hours				Credits
	Lectures	Practical	Lab. works	Consultation	
Industrial Logical Controllers	24	12	00	02	3
Design of Mechatronic and Robotic Systems (with course project)	24	00	24	04	6
Quality and Certification in the Automated Industry	24	12	12	04	6
Bachelor Graduation Thesis 2	00	00	12	04	6
Bachelor Graduation Thesis 3	00	00	00	00	9
Total:			**144**		**30**

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DISCUSIONS POINTS

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1. How many percent of each categories
2. Bachelor Thesis
3. Career Internship
4. Courses of program

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QUESTIONS

THANK YOU FOR ATTENTION

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