Faculty of Automatics and Robotics – specialties

Undergraduate studies – specialities

Mobile robots
This speciality aims to prepare students to analyse robot kinematics and dynamics, to support, programme, and operate mobile and service robots, and to use sensory data visualizations. The graduate will also have expertise regarding, among others, electronics, mechanical engineering, control, and computer science. The graduate will know how to use algorithms for planning the movements and the control of robots capable of moving on their own.

Information technologies in automation
This speciality prepares the graduate to use information technologies to acquire measurements, control technological processes, design, launch, and maintain autonomous systems, visualize sensory data, programme operator stations and controllers, apply measurement and performance automation devices, and construct industrial networks with PLC, PAC, and DCS devices. It also prepares graduates to implement industrial automation system projects using microcontrollers and computer networks.

Control of technological processes
The specialisation aims to familiarize students with mathematical modelling of processes, digital processing of measurement signals, system analysis and methods of optimal control synthesis. The specialization is based on modern solutions implemented on computers and with the use of specialized microprocessor controllers. The student acquires knowledge in the field of process modelling, technological process control, measurement signal processing, creating computer automation systems, optimal control methods, design methodologies, creating and programming computer automation systems, programming PLC controllers, operating selected industrial automation devices and measurements, and technological process control.

Graduate studies – specialities

Automation and robotization of technological processes
The specialization aims to familiarize students with automation and robotization technologies present in the industry, including these related to robotic production lines. The study plan for the Automation and Robotization of Technological Processes specialization focuses on expanding knowledge and skills in the field of control, automation systems and the design of technological lines – effective, reliable and safe. The main direction of employment is automation in industry. Besides, the specialization program covers very innovative issues of artificial intelligence and human-machine communication. Such knowledge, in connection with robotics and mechatronics, introduces into the next generation of automation systems, intensively developed, among others in the automotive industry (autonomous vehicles), household appliances and intelligent buildings (with voice communication). It also prepares for research and development works involving advanced robots and systems, characterized by intense and very intuitive interaction with humans.

Industrial Internet of Things
This specialization aims to familiarize students with the applications of the Internet of Things according to the convention of „Industry 4.0”. Particular emphasis is placed on communication with various types of sensors and transducers and the processing of data from them. During the studies, issues related to intelligent technological processes, intelligent devices, buildings, networks and cities are discussed. Graduates acquire competencies related to programming mobile devices and microcontrollers. The study plan for the Industrial Internet of Things specialization introduces to the issues of storage, fast transmission and processing of sensory data, and thus prepares for tasks related to computerization of production, storage and transport. It also opens the way to research and

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development in this field. Microcontroller programming classes, in particular, combined with an introduction to FPGA programming, lead to a deeper understanding of the interaction between the program executed by the microprocessor and the electronics connected to it. This allows to enter the market of embedded systems, including the design of devices used not only in industrial automation but also in automotive, household appliances, biomedical, telecommunications and others. The concept of embedded systems is developing rapidly, penetrating new technological areas and constantly suffering from staff shortages.

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