Republican Institute for Vocational Education Republic of Belarus



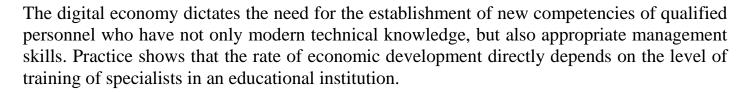
INDUSTRIAL TECHNOPARK 4.0

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Primary areas:

- Mechatronics and Robotics
- Electrical engineering and Electronics
- Pneumatic and hydraulic drives
- Mechanical workshops and industrial maintenance
- Engineering systems of buildings
- Communications and radar technologies

- Renewable energy sources
- Environmental protection technologies
- Aqua technologies
- Heating, ventilation and air conditioning systems
- Repair and adjustment of industrial equipment



Scientific and technological progress in education is a strategy for the development of new qualifications for the industry of the future



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STEM Laboratory



By directions:

• Research in the field of real production technologies, Energetics, various physical processes with practical application

• Basic training required for research and projects, technologies on training and production equipment

• Development of solutions to current problems modern technology, technologies with access to prototypes of real products with the usage of industrial components

• An integrated interdisciplinary STEM (Science, Technology, Education, Math - science, technology, education, mathematics) approach in the training of future engineering personnel

Three complementary clusters:

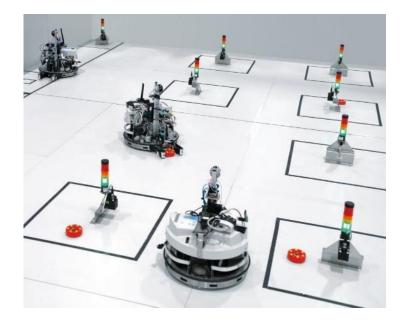
- Advanced production
- Mechatronics
- Bionics and natural technologies



Mobile Robotics Laboratory

The educational mobile robot can be used as an independent element of the laboratory, as well as an addition to mechatronic complexes.

Using a mobile robot in the educational process allows students to develop programming skills as applied to specific applied problems, emulating production logistics tasks at industrial enterprises



Typical configuration of a training mobile robot:

- Movable platform with a set of sensors
- Logistic kit
- Forklift
- Laser scanner
- Study guide

Electrical Engineering and Electronics Laboratory



Training stand allows you to organize practical training and laboratory classes on such disciplines as "Electrical Engineering", "Electronics" and "Digital Technology", to conduct tests, to practice skills of troubleshooting, tuning and debugging

- "Fundamentals of Electrical Engineering and Electronics " training kit
- "Digital Technology Fundamentals" training kit
- "Electrical Safety Measures" training kit
- "Fundamentals of Automatic Control systems" training kit
- The set of training PCBs, tools and cables
- FluidSim software
- High quality durable furniture

Electric Drive Laboratory

The training stand allows you to organize hands-on training and laboratory exercises on such disciplines as "Automated electric drive" and "Electrical machines", to conduct tests, to practice skills on troubleshooting, tuning and debugging



- "Servotormoz" training kit
- "Contactor control circuits" training kit
- Synchronous machine and three-phase asynchronous machine
- Sinamics G120-DP frequency converter
- FluidSim software
- High quality durable furniture

Aquatronics Laboratory

Complex of educational and laboratory equipment allows you to study disciplines such as "Water treatment" and "Water purification", to conduct tests, practice troubleshooting skills, to emulate the operation of water treatment plants using software



Basic set of the educational complex:

- Water treatment station
- Water transportation station
- Sand filtration station: coarse cleaning
- Membrane filtration station: fine purification
- FluidLab software

Electrical Installation Laboratory

The training stand allows you to organize practical training and laboratory classes on the discipline "Electrical installation", to carry out tests, to practice troubleshooting search skills, configuration and debugging



- Electrical cabinet
- "Servotormoz" training kit
- A set of accessories
- High quality durable furniture

Pneumatics Laboratory

The stand allows you to organize practical training and laboratory classes in such disciplines as "Pneumoautomatics", "Electro-pneumoautomatics", "Sensors in pneumatic systems", to collect and to study pneumatic circuits of technological equipment, to conduct tests, to practice troubleshooting skills, settings and debugging



- Compressor and power supply
- "Pneumoautomatics" training kit
- "Electropneumatic automatics" training kit
- "Sensors in pneumatic systems" training kit
- Connecting cables and tools
- FluidSim software and EasyPort kit
- High quality durable furniture

Mechatronics Laboratory

Modern modular equipment for the development of programming skills to be used for real production tasks, allowing you to create a prototype of an element of a modern factory with the production of consumer goods.



Possible laboratory equipment on mobile bases:

- Workpiece feeding station
- Distribution station
- Processing station with rotary distributor
- Processing station
- Moving station
- Buffer station
- Station with a Mitsubishi robot (* option)
- A set of programmable logic controllers
- A set of blanks
- Compressor

Mechanics Laboratory

Training stand "Mechanics" has a modular structure of equipment and allows to conduct practical training on installation, routine maintenance, diagnostics and mechanical equipment troubleshooting



- Mounting base with drive motor
- Panels with couplings and shafts
- Panel with support bearings
- A set of belt and chain elements and gears
- Teaching materials and supplies
- High quality durable furniture

Hydraulics Laboratory

The training stand allows you to organize practical training and laboratory classes on such disciplines, as "Hydropower Automation" and "Hydroelectric Automation", to collect and to study technological equipment hydraulic circuits, to conduct tests, to practice search skills of troubleshooting, configuration and debugging



- Hydraulic pumping station and power unit
- "Hydropower Automation" training kit
- "Hydroelectric Automation" training kit
- Cables, hydraulic hoses, a set of tools
- FluidSim software and EasyPort kit
- High quality durable furniture

Continuous Process Automation Laboratory



A set of educational and laboratory equipment is designed for studying continuous processes, present, for example, in oil and gas industry and food production.

A compact workstation for simultaneous work of two people allows you to monitor and control system parameters such as flow rate, fill level, temperature, pressure

The composition of the educational complex:

- Tanks and piping system
- Set of sensors
- Pumping station, heating system, actuators
- Air-water cooler
- Remote Control
- FluidLab software

Fundamentals of Industry 4.0 Laboratory



The compact automated training complex for studying the basics of Industry 4.0 includes three modified specialized stations on mobile platforms. The complex allows the group of students not only to learn the technical elements of mechatronic stations, but also to manage production cycle using MES-systems. The control programmable logic controllers of the complex are networked. Specialized heads are equipped with functions of reading and writing to RFID tags. The possibility of using QR codes is provided



Industry 4.0 Cyberphysics Laboratory



Professional laboratory complexes for studying management in the field of Industry 4.0 are distinguished by a wide range of possibilities for use in the educational process and a great infrastructure. In fact, on the basis of Festo training technologies, a production prototype can be created that combines both technological and managerial tasks. Cyber physical laboratories allow, among other things, to study issues of information security and remote control, to control energy consumption and preventive maintenance

Further coverage of Industry 4.0 technologies is being implemented in the Cyber physical Factory CP-Factory.

With a similar industrial orientation, all aspects of the Industry 4.0 can be learned and implemented in a real technology environment



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