

Study branch Machine and Process Control

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Faculty	Faculty of Mechanical Engineering
Study programme	Engineering
Type of study	Bachelor
Language of instruction	English
Code of the branch	S05
Title of the branch	Machine and Process Control
Regular period of the study	3 years
Cost	50,000 CZK per semester
Coordinating department	Department of Control Systems and Instrumentation
Coordinator	doc. Ing. Renata Wagnerová, Ph.D.
Key words	automation, automatic control, proces visualisation, applied informatics, logic control

About study programme

Our work may be complex, but it can be easily explained. So what do graduates of Machine and Process Control do? It is behind the automation of production across a range of industries. Most automated lines can be found in the food industry. They fill your favorite lemonade, pack the addictive sweet sticks. But even such a car factory is one large automated factory. In our work, IT is linked to engineering. First we have to come up with the hardware, and then the IT part comes. The advantage of the field is the versatility with which you can be applied in a wide field of industry as a designer of control, measuring or diagnostic systems of industrial equipment. You will be well versed in related engineering fields.

Professions

- Academic staff member
- Scientific researcher for process control
- Automation systems specialist
- Enterprise information systems specialist
- Industrial data analyst
- Research and development specialist

Hard skills

- Applied informatics and management
- Knowledge of signal processing methods
- Programming of industrial PLC applications
- Knowledge of automation
- Machinery diagnostics
- Design of hydraulic systems
- Measurement of electrical and non-electrical quantities
- Sensors of physical quantities
- Knowledge of technical diagnostics
- Process simulation
- Knowledge of data analysis
- Knowledge of process optimization

Graduate's employment

Graduates have a wide range of jobs because the introduction of information technology and automation takes place in all industries, services or government. Graduates can work as:

- programmers of programmable logic controllers (PLCs)
- Software developers
- designers of measuring, diagnostic and control systems of industrial equipment
- specialists providing operation, adjustment, programming, diagnostics, maintenance and repairs of complex production-technological units.

Graduates are equipped with the skills and knowledge to enable them to grow professionally through creative involvement in the production process or by continuing their master's degree program (Automatic Control and Engineering Informatics, Mechanical Engineering Program).

Study aims

The student will gain knowledge of the following areas:

* Software

Control of technological processes, PLC programming, principles of hydraulic and pneumatic mechanisms, sensors, sensors and transducers.

* Applied Informatics

Creation of information systems, technology of data acquisition, methods of further data processing using databases, Internet of Things using Arduino, principles of current hardware of personal computers and LAN computer networks.

* Process visualization

Control room environments, sensor data collection and data visualization tools.

* Theory of automatic control

Mathematical modeling, analysis and synthesis of control circuits, modeling and simulation of mechatronic systems.

Graduate's knowledge

- methods of design and operation of measuring, diagnostic and control systems of industrial equipment
- theory and application of automation and informatics
- practical use of computers and their networks to support the management of production processes and technical-economic tasks

Graduate's skills

- practical problems in implementing computerized support for production system management
- use of industrial automation visualization software tools
- design and build web information systems applications
- Configure the operating system from the administrator's perspective
- Create computer networks and administer them
- find, organize and interpret relevant information to solve practical problems
- design and implement logic control applications, adjust PID controller parameters

Graduate's general competence

- teamwork experience

- learn to coordinate team activities
- processing projects related to the bachelor thesis
- elaboration of high-quality, sufficiently extensive and critical research of solved problems
- ability to use modern computational methods and efficiently evaluate outputs of technical measurements