

# Study programme Mechatronics

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<b>Faculty</b>	Faculty of Mechanical Engineering
<b>Type of study</b>	Follow-up Master
<b>Language of instruction</b>	English
<b>Code of the programme</b>	N0714A270004
<b>Title of the programme</b>	Mechatronics
<b>Regular period of the study</b>	2 years
<b>Cost</b>	50,000 CZK per semester
<b>Coordinating department</b>	Department of Control Systems and Instrumentation
<b>Coordinator</b>	prof. Ing. Petr Noskievič, CSc.
<b>Key words</b>	

## About study programme

Do you waver between mechanical or electrical engineering or IT? You don't have already!

Mechatronics, this is the up-to-date connection of the fine mechanics, electronics and intelligent computer control systems.

Each modern product can be practically called mechatronic system. You can find a job in mechanical or electrical engineering, robotics, biomedicine, and next related branches.

During the studies you learn to design, to test and also to control mechatronic systems, which scan the signals from the environment (temperature, position, velocity, pressure, sound, image etc.), are able to process them and transform into the control signal, which finally controls the for example the movement of the robot or production machine.

You will learn to design them as an advanced product characterized by the use of artificial intelligence, interactivity or autonomous behaviour.

## Professions

- Academic staff member
- R&D engineer

## Hard skills

- Process simulation
- Basics of spectral analyses
- Programming of industrial PLC applications
- Work in MATLAB and Simulink
- Control electronics (control systems with microprocessors)
- Industrial automation
- SW - MATLAB/Simulink (creation of simulation models and system simulation)
- Knowledge of mathematical models
- Programming of industrial PCs
- Measurement of electrical and non-electrical quantities

## **Graduate's employment**

Interdisciplinary education is a great advantage for the future work of the graduates in different areas in mechanical and electrical engineering. The graduates can become the members of the project teams and are ready to start their professional career in research and development in engineering, automotive industry, IT and production of different kind.

## **Study aims**

The goal of the study programme Mechatronics is to prepare the graduates for R&D activities in the field of Mechatronics, to be able to design mechatronic systems for the applications in different productions and for different technologies. The profile of the graduate involves the methods of the integrated design of the mechatronic system, that consists of mechanical subsystem, electrical subsystem, actuators and control system. The graduates know the methods of computer aided design, mathematical modelling and computer simulation as well as control systems design.

## **Graduate's knowledge**

The graduates of the study programme Mechatronics have knowledge important for the design of mechatronic systems. They know a lot about automatic control systems, applied mechanics, electronics and microprocessor systems, measurements and signal processing.

They have experience with electrical, hydraulic and pneumatic drives and their control systems, next with measurements and sensors and diagnostic signal processing.

## **Graduate's skills**

The graduates are able to analyse the dynamic properties of the complex structure systems and use the methods of mathematical-physical modelling and simulation of dynamic systems. They know, how to use the CAD software for design of mechatronic systems, control algorithms and software for data acquisition, monitoring and visualisation of technological processes. They are ready to design the measurement of important variables of the mechatronic system and to design the identification experiment of the dynamic properties of the controlled systems. Based on the dynamic analysis they are able to design the control system using PLC, industrial PC or embedded control systems.

## **Graduate's general competence**

The knowledge from the electrical, mechanical and control systems makes possible to take into the account the complex structure of the mechatronic system and consider the interactions of different dynamic subsystems during the design phase of the new mechatronic system and using the suitable designed control system to achieve the desired dynamic properties of the final mechatronic system. The graduates are ready for the team work, to discuss technical problems with other specialized groups.

## **Study curriculum**

- form Full-time (en)