VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MECHANICAL ENGINEERING

Study branch Hydraulics and pneumatics

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Faculty	Faculty of Mechanical Engineering
Study programme	Engineering
Type of study	Bachelor
Language of instruction	English
Code of the branch	S02
Title of the branch	Hydraulics and pneumatics
Regular period of the study	3 years
Cost	50,000 CZK per semester
Coordinating department	Department of Hydromechanics and Hydraulic Equipment
Coordinator	doc. Dr. Ing. Lumír Hružík
Key words	Pumping Engineering, Hydraulics, Pneumatics

About study programme

You will become an expert in the design of machinery and elements in which liquid or compressed air plays a primary role. As a graduate you will master the laws of hydrostatics, the laws of flow of ideal and real fluids, and you will be able to use them in practice in the construction of hydraulic and pneumatic systems. You will get acquainted with the design and characteristics of individual elements and test their function on interactive simulators. You will then apply this knowledge in your profession as a designer or technician. Just look around, hydraulics and pneumatics are everywhere. If you have a talent to trade, you can not only design these devices, but also sell them. You can also find job in related fields, such as lubrication technology, transport of liquids and gases, water management, or even hydraulic and pneumatic transport.

Hard skills

- Measurement of electrical and non-electrical quantities
- Reading technical documentation
- 2D design programmes
- Designing pneumatic systems
- Design with the support of CAD system Creo
- Processing of drawing documentation
- SW 3D/CAD
- Design of pumps and pumping systems
- Design of hydraulic systems
- Orientation in schemes

Graduate's employment

Graduates will find employment as designers or planners of hydraulic and pneumatic systems, or as technicians providing operation, diagnostics and repairs of fluid systems.

Study aims

The specialization "Hydraulics and Pneumatics" is part of the bachelor's study program "Mechanical Engineering". The main objective of this specialization is to acquaint students with elements and systems for energy transmission through fluids and with principles of

fluid systems control. During the first four semesters, students will gain a common technical background in the field of rigid and elastic body mechanics, fluid mechanics, thermomechanics, elasticity and strength, machine parts and mechanisms, engineering technology and automation basics in the common part of the study. The third year of study is focused on hydraulics and pneumatics. The basic professional subjects are Hydraulic Mechanisms and Pneumatic Mechanisms, which are complemented by other field subjects. Students apply the acquired knowledge and skills in the field of hydraulic and pneumatic components, mechanisms and circuits. They will also get acquainted with modern CAD systems for construction work support. The graduates are thus ready to become a designer in mechanical engineering with special knowledge in the field of hydraulic and pneumatic mechanisms.

Graduate's knowledge

Graduates of the course "Hydraulics and Pneumatics" will gain knowledge about the design and function of hydraulic and pneumatic elements and the composition and control of systems using pressure fluid or compressed air to transfer the energy. In the framework of vocational subjects, students will broaden their knowledge of theoretical subjects. Graduates then master the laws of hydrostatics, laws of fluid flow and can use them in practice in the design, analysis, synthesis and diagnostics of hydraulic and pneumatic systems.

Graduate's skills

Using professional knowledge, the graduates are able to solve practical problems in the field, to find and organize the information needed to solve a given problem using computer support (CAD, etc.). They can design parts of hydraulic and pneumatic systems. They can read and draw functional diagrams of hydraulic and pneumatic circuits. Based on practical tasks, they are able to assemble hydraulic and pneumatic circuits, propose methods of their control, calculate the parameters of a steady-state circuit, and perform basic dynamic calculations. They can write a technical report, process specifications of used elements and devices, elaborate assembly, operation and maintenance guide of equipment. They can develop a diagnostic procedure and perform diagnostic measurements on components and systems. They also know the basic research procedures and methods of the field and can use them to solve practical problems.

Graduate's general competence

Graduates are able to present their results to the lay and professional public, defend their solutions, propose technical solutions with regard to economic, ecological, occupational safety requirements, etc. They are able to acquire professional knowledge by studying theoretical background from professional literature, but also on the basis of practical experience. They can search for the necessary data on the Internet. They can design technical solutions on the basis of a framework assignment from areas they know only partially. They prove this ability by solving individual projects in professional subjects, solving yearly projects and especially by processing and defending their bachelor thesis. They can work in a team and, to a certain extent, they can coordinate the work of a team.