Materials Engineering

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Faculty	Faculty of Materials Science and Technology
Type of study	Bachelor
Language of instruction	English
Code of the programme	B0719A270003
Regular period of the study	3 years
Cost	50,000 CZK per semester
Coordinating department	Department of Materials Engineering and Recycling
Coordinator	doc. Ing. Josef Hlinka, PhD.
Keywords	advanced materials, materials engineering, heat treatment, materials structure, mechanical properties

About study programme

The Materials Engineering study program offers a good perspective in terms of employment in the labor market. Students will get to know all important groups of technical materials - metals, polymers, structural ceramics to composite materials. The program includes basic information on the technologies of preparation and further processing of materials, it deals in detail with methods of testing properties and evaluating the structure of materials. The guaranteeing workplace has laboratories that are comparable to similar workplaces in developed countries. Students already have the opportunity to get involved in solving industrial problems during their studies, they can also complete internships abroad. If interested, graduates can further deepen their knowledge in the follow-up master's degree program Materials Engineering, or study the Double Degree Program between VŠB – TU Ostrava and National Yokohama University, Japan.

Graduate's employment

Graduates of the Materials Engineering study program will find employment in numerous enterprises and companies in the engineering industry, metallurgical industry, automotive industry, etc. engaged in the production, further processing, and testing of the properties of various types of technical materials, from metallic materials, through polymers, structural ceramics to composite materials. Their further application is also possible in the field of research and development of technical materials, in educational institutions, and elsewhere.
Typical job positions:
• Managers in the field of research and development;
• Specialists in industrial engineering and related fields;
• Technical specialists in other fields;
• Engineering technicians; Mining and metallurgical technicians and workers in related fields; Technicians in other industrial fields.

Study aims

The main goal of the study is to equip students with such knowledge and skills that they are able to analyze materials, their production technologies, mechanical or technological properties, etc.; further carry out advanced design of technical materials for selected conditions of use; propose appropriate types of tests for evaluating the mechanical properties of materials and methods for evaluating structural characteristics, evaluate tests in a qualified manner and perform some types of evaluations yourself; carry out research in the field of material engineering, etc.

Graduate's knowledge

• The graduate has knowledge of production technologies, processing and recycling processes of basic groups of technical materials.
• The graduate has knowledge of the most important properties of technical materials, especially mechanical, physical and chemical properties; it also contains the most important methods of evaluating material properties.
• The graduate has knowledge of the internal structure (microstructure) of the main groups of technical materials at different dimensional level, and also masters the most important methods of evaluating the structure of technical materials.
• The graduate masters the basic characteristics of the main groups of technical materials (metals, polymers, ceramic materials and composite materials); in particular, the connections between their internal structure and useful properties, as well as the basic concepts of controlling the properties of materials by means of changes in their chemical composition and structure based on the optimization of their production and further processing technologies.
• The graduate has knowledge of the most important degradation mechanisms of technical materials, including factors that influence the resistance of materials to these degradation mechanisms.

Graduate's skills

The graduate is able to:
• Select proper technical material for the typical conditions of use (mechanical stress, external environment, etc.).
• Design suitable types of tests for the evaluation of mechanical, or other properties of materials, to propose appropriate types of tests for evaluating the structure of materials and to perform some of the tests yourself.
• Design basic technological procedures for the production and processing of materials with regard to the required mechanical other useful properties.
• Design suitable technological procedures for recycling technical materials.
• Carry out basic expertise in the field of materials - for example, define the likely causes of defects, or degradation of materials during their production, further processing and subsequent operational exposure, determine the causes of unsatisfactory mechanical and other useful properties, etc.
• Actively participate in production management processes and quality control of technical materials.

Graduate's general competence

The graduate has sufficient soft skills, is linguistically equipped with knowledge of at least one foreign language at the B1-B2 level according to the Common European Reference Framework, is ready for teamwork, has adequate organizational and management skills, etc.

Study curriculum

- form Full-time (en)