

General information

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MATERIALS AND METALLURGY

Programme title: Second-cycle (master's) University study programme in Materials and Metallurgy

Duration: 2 years (4 semesters) with a total of 120 ECTS.

Professional title awarded upon graduation: magister/magistrica inženir(ka) metalurgije in materialov (mag. inž. metal. mat.)

Study programme goals and general competences

The study programme is new and replaces the 'non-Bologna' study programme in Materials and Metallurgy. The main objective of the Master of Science programme in Materials and Metallurgy is to train professionals who will gain in-depth and focused knowledge and skills in the expert field of materials and metallurgy science. Within the study course, the student will acquire the traditional principles of material research upgraded to the latest findings.

The basic objective of the master's programme in Materials and Metallurgy is to qualify professionals to seek employment in research institutions in the areas of natural sciences and engineering, primarily in development, manufacturing and application of standard and modern functional materials, as well as in administrative services or to continue their careers in academic institutions.

By working in groups as well as on project work and problem assignments, students will become accustomed to working in groups, public speaking and conducting business with customers and will be actively involved in the research. Student will test all their acquired knowledge to the fullest extent possible through test cases in exercises and solving complex theoretical or specialised technical problems and projects, as this will allow for easier integration into practice after graduation and understanding of issues from narrower fields of materials and metallurgy. Students acquire vital in-depth and focused knowledge of fundamental natural science and computer and information courses and will upgrade their knowledge from basic courses of metallurgical profession and specific knowledge from technical courses. As part of the curriculum and optional courses, the student is given the opportunity to specialise and prepare for further studies in programmes at the tertiary level.

Graduate competence profile

General competences+

- achievement of adequate level of knowledge in chemistry, mathematics, physics, mechanics and information science comparable to standards at similar European universities;
- ability to use fundamental professional knowledge of interdisciplinary disciplines pertaining to materials and metallurgy engineering and complementary fields for planning and processing of the existing and new materials or processes;
ability to analyse, synthesise and understand the correlations between
- technological solutions, the environment and society;

- ability to communicate with co-workers and actively participate in multidisciplinary research groups;
- understanding the principles of management and business practice;
- achievement of adequate level of knowledge to proceed to studies in doctoral programmes
- ability of independent learning and understanding the need for lifelong learning
- ability to independently perform research tasks in R&D,
- performing engineering and organisational tasks and solving well defined tasks in the area of engineering materials,
- ability to understand their professional and ethical responsibility.

Employment possibilities+

With the knowledge and skills acquired through studies of materials and metallurgy, broad employment opportunities in various sectors of the economy, public administration and beyond, including research, educational and other fields, are provided.

Professionals in materials and metallurgy science will be able to engage in various tasks related to materials research and development and technology of making materials and can seek employment in the following areas:

- researching physical and chemical properties and applying suitable analytical methods for understanding the properties of engineering and other materials.
developing or improving materials for different applications.
- understanding and solving problems of environmental impacts due to production
- apply strategies for direct use of raw materials, recycling and materials reuse;
- optimisation of manufacturing and use of materials from the aspect of material life;
- processing of materials to be used in different products;
- conducting and control of materials on the industrial scale;
- analysing the atomic structure of materials, materials characterisation,
- materials forming, optimisation of methods and development of technological processes or equipment.

All of the above refers to materials such as steel, plastics, ceramics and composites and nano-structured materials, which are now becoming a new propulsive field.