

# Presentation

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## Materials Studies – the eternal harbinger of the development of civilisations

From the very beginning, the use and development of materials has been closely linked with the development of civilisation and its era; this applies equally to primitive use by ancient humans and to contemporary space exploration. In the information age, communication with far-away parts of our planet is made possible through purposely developed materials (for example, mobile phones). The experts developing materials (metal, polymers, ceramics and composite materials) simultaneously also design the technologies for their manufacture. The management of such technologies takes place on the macro-, micro- (a thousandth of a metre; we can still see it with the help of an optical microscope, yet it is still one thousand- times larger than an atom), mezzo- and nano-levels. The technologies at the lower levels are essential for the development of modern technologies and for our personal lives.

## Organisation of the study programme

The Department of Materials and Metallurgy at the Faculty of Natural Sciences and Engineering of the University of Ljubljana has the longest tradition of such studies in Slovenia. Each year, it offers enrolment in the university study programmes of Materials Engineering (undergraduate level) and Materials and Metallurgy (postgraduate level) as well as the higher education programme of Metallurgical Technology (undergraduate level). During their studies, students also participate in research projects for the economy. By applying to the Erasmus+ programme, they also have the opportunity of completing a year or semester at a foreign university.

## Education

Because the study programme is interdisciplinary, graduates from our department acquire a wide range of useful knowledge and skills, which we can divide into the following groups: the basics of understanding and researching the composition and properties of materials, the development of new materials and their production technologies, the use and synthesis of materials in engineering and research into a material and the analysis of its damage. Graduates learn the skills required for modelling the properties of materials and simulating and optimising technologies. They acquire first-rate knowledge and a high degree of interdisciplinary skills, which is why they are employable and sought after both in Slovenia and abroad.

Materials are the starting point for all techniques, manufacturing technologies and new products. The acquired knowledge and skills, the basis of which are the natural sciences and technology, are useful for development work in laboratories, for planning and executing technologies and for consulting work when choosing the appropriate material for a product and including it in devices, buildings or constructions. The study course is

designed to equip a graduate with an innovative and entrepreneurial spirit.

## Employment and scholarships

Graduates find employment at research institutes and at research and development departments of most manufacturing industries and also as technologists in manufacturing and processing industries working with steel, non-ferrous metals, ceramics, polymers and composites, semi-conductors, etc. They can work in companies that produce or put together semi-finished or finished products, for example the motor vehicle industry, the electrical industry, the chemical industry and the energy sector as well as in the fields of medical technology, criminology, archaeology and environmental work. They are also essential for national institutions that need them for the certification of materials and products, national research and project management and secondary schools and universities for teaching jobs. University experts, who also have knowledge of economy and management, enjoy a special status. The lack of material and metallurgic experts has reached a critical level in Slovenia. In future, individuals will be able to profit from an adequate number of scholarships and job openings.

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### What are you waiting for – The Choice is Yours!

- Continued surplus of job openings in Slovenia.
- A 5% annual growth of jobs for material and metallurgy engineers is also an EU commitment.
- Unused scholarships.
- An increase in the number of enrolment places demanded by the Ministry and the economy.
- Possibility of studying abroad.
- A high rate of employment flexibility.



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