DESCRIPTION OF THE DEGREE PROGRAMME

Materials science and engineering

is an interdisciplinary field which examines engineering materials (metal, ceramic, polymer and composite materials), principles of material selection for various applications and technologies of manufacturing new materials. It also deals with methods of material forming and examination of structure and properties of materials. It incorporates elements of such disciplines as physics, chemistry, mechanics and computer science.

Materials science and engineering is nowadays a driving force of modern industries, from space, aviation and automotive industry, through materials for medicine up to everyday life where advanced electronics and telecommunication are based on the recent achievements of materials science.

Degree programme in materials science and engineering has an interdisciplinary character and comprises basic courses (mathematics, physics, chemistry), major courses and specialization courses. Program of studies includes many hours spent in the laboratory where students have the opportunity to acquire and develop their practical skills in the field of materials processing and characterization. Special emphasis is placed on plasma based surface treatment and thin film technologies as well as modern ceramic materials. Research laboratories for materials science are fully equipped and very modern, they were officially opened to students in September 2011. Laboratories of metals, ceramics, plastics and plasma technologies give students the possibilities to carry out various experiments, such as: hardening of steel, sintering of ceramics or generating of thin carbon-like layers using plasma methods.

Graduates of materials science and engineering possess all the essential qualifications required to design technologies of materials processing and select materials for specific applications. In particular, their competences encompass vacuum based plasma technologies of thin film coatings and surface treatment of materials as well as design and processing of modern ceramic composites.

FORMS OF STUDY

• 1st degree – B.Sc. studies (Engineer's degree) – full-time studies, duration of studies: 7 semesters

• 1st degree – B.Sc. studies (Engineer's degree) – full-time studies in English, duration of studies: 7 semesters

• 1st degree – B.Sc. studies (Engineer's degree) – extramural studies, duration of studies: 7 semesters

• 2nd degree – M.Sc. studies (Master's degree) – full-time studies, duration of studies: 3 semesters

• 2nd degree – M.Sc. studies (Master's degree) – extramural studies, duration of studies: 3 semesters

SPECIALIZATIONS:

· Coatings and ceramic composites for technology and medicine (1st and 2nd degree)

· Devices and technologies designing (1st and 2nd degree)

MATERIALS SCIENCE AND ENGINEERING – SAMPLE COURSES

• Introduction to materials science

• Fundamentals of materials science

• Metals and alloys

• Ceramic materials

• Polymeric and composite materials

• Fundamentals of composite technologies

• Methods and techniques of materials testing

• Surface engineering

• Vacuum and plasma technique

• Electrical engineering

• Digital electronics in materials technologies

• Technical mechanics

• Object-oriented programming of machines and devices

• Strength of materials

EMPLOYMENT PROSPECTS

Graduates of materials science and engineering are well-trained to work as:

• constructor of technological apparatus and components

• process/product engineer

• technologist in constructional departments

• test and quality control engineer

• materials technology specialist

• vacuum processes technologist

• research and development engineer

Graduates can find employment in:

• various branches of industry: tool, automotive, building materials, electronic, medical equipment and home appliance industries

• companies which manufacture biomaterials and implants

• construction and design departments

• production departments which manufacture and process materials

• technology consulting department which deal with material and technology transfers

• large research units