



# Faculty of Technology and Metallurgy

# Biochemical Engineering and Biotechnology

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, [www.tmf.bg.ac.rs](http://www.tmf.bg.ac.rs)

ECTS: 60/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: MASTER

## Study program content

The full course workload of the master academic study program has been assigned 60 ECTS credits. The study program comprises active teaching and research work towards the master thesis.

Active teaching is delivered in the first semester of study and encompasses compulsory and elective courses in a total workload of at least 30 ECTS credits. In the second semester of studies, work towards the master thesis is carried out and is equivalent to a workload of 30 ECTS credits.

The master thesis represents the student's scientific research in the field of the study program. The goal of the thesis is that the students gain experience and competence to conduct scientific research independently. The defense of the master thesis is public, and both the thesis and defense are evaluated by a committee composed of the supervisor and at least two members.

## Study program goals

The primary objective of the master academic study program Biochemical Engineering and Biotechnology is directed towards the education of highly qualified engineers with a broad fundamental and engineering basis in the field of biotechnology that are capable of transferring their knowledge into industrial practice, i.e. that are able to independently or in a team participate in the realization, optimization, control and management of biotechnological processes.

Besides, master engineers of this study program should be capable to work in design and R&D institutions in this area for the purpose of developing and optimizing new contemporary biotechnological procedures with small amounts of waste materials, based on the principles of integrative energy savings. In addition, the program is intended to enable students, through elective courses, to gain knowledge in concrete biotechnological processes used in food technology in order to be capable to apply them in industrial practice.

## Study program outcomes

By completing the master academic study program in Biochemical Engineering and Biotechnology the students gain the following general knowledge and competences:

- Communication and social skills for explicit formulation of a problem and approaches to problem solving as well as for the presentation of results and conclusions to fellow professionals and the general public;
- Competences for independent work and the ability for team work.
- The students also gain specific professional abilities in the field of biotechnology;
- Professional knowledge for work in industry, which is based on biotechnological production processes;
- Knowledge and social and ethical competences for analyzing the effects of biotechnological processes on the environment and the health of humans;
- Professional knowledge and academic skills needed for the analysis, synthesis and optimization of novel and existing biotechnological processes;
- Professional knowledge needed for the design of biotechnological processes and devices.

## Admission requirements

Graduates in academic study programs of at least 240 ECTS.

Materials and consultations in English

## Contact

Head of the study program:  
**Prof. Dr. Ivanka Popović**  
Telephone: +381 11 337 05 03  
Contact e-mail: [tmf@tmf.bg.ac.rs](mailto:tmf@tmf.bg.ac.rs)

# Materials Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, [www.tmf.bg.ac.rs](http://www.tmf.bg.ac.rs)

ECTS: 60/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: MASTER

## Study program content

The full course workload of the master academic study program has been assigned 60 ECTS credits. The study program comprises active teaching and research work towards master thesis. Active teaching is delivered in the first semester of study and encompasses compulsory and elective courses in the total workload of at least 30 ECTS credits. In the second semester of studies, the work towards master thesis is carried out and is equivalent to a workload of 30 ECTS credits. Master work represents a student's scientific-research work in the field of the study program. The goal is that the students gain experience and competence to conduct scientific research independently. The defense of master thesis is public, and both the thesis and defense are evaluated by the committee composed of the supervisor and at least two members.

- Expertise in the fields of ceramic, polymeric, metallic and composite materials;
- Capacity to head multidisciplinary teams in industry;
- Possibility of further education at the level of doctoral program of study both in the specific field of materials engineering and in other related fields.

## Admission requirements

Graduates in academic study programs of at least 240 ECTS.

Materials and consultations in English

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## Study program goals

The study program Materials Engineering at the master level is intended to educate master engineers to be able to manage production processes, to solve current problems in the production as well to design new materials and new production processes. An expert of this profile perfectly knows properties of materials and processes by which they are produced. Besides, the objective of the program is that a student masters ecological aspects of materials production, as well as knowledge needed for a successful prediction of the impact that these materials and processes might have on the environment, with a particular emphasis on the degradation of materials and possibilities of their recycling.

## Study program outcomes

Graduate engineers of the study program Materials Engineering are competent for the following:

- Qualification for managing production as well as for the use of wide range of materials and control of their properties not only during production and processing but also during the period of use;

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Contact e-mail: [tmf@tmf.bg.ac.rs](mailto:tmf@tmf.bg.ac.rs)

# Chemical Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, [www.tmf.bg.ac.rs](http://www.tmf.bg.ac.rs)

ECTS: 60/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: MASTER

## Study program content

The full course workload of the master academic study program has been assigned 60 ECTS credits. The study program comprises active teaching and research work towards master thesis. Active teaching is delivered in the first semester of study and encompasses compulsory and elective courses in the total workload of at least 30 ECTS credits. In the second semester of studies, the work towards master thesis is carried out and is equivalent to a workload of 30 ECTS credits.

Master work represents a student's scientific-research work in the field of the study program. The goal is that the students gain experience and competence to conduct scientific research independently. The defense of master thesis is public, and both the thesis and defense are evaluated by the committee composed of the supervisor and at least two members.

## Study program goals

The study program is intended to educate master chemical engineers, with specialized professional knowledge, who will assume a leading role in economy and society. Besides, the program is aimed that these professionals will have a basic knowledge of scientific-research methodology as the basis for further education at doctoral studies.

The program is also designed to be flexible, various and accordingly accessible to engineers of different disciplines, such as environmental, materials and mechanical engineers, for broadening their basic, previously gained knowledge. In addition to compulsory courses of basic sciences, offered is a wide range of elective courses providing specialization in chemical processing, pharmaceutical, polymer and electrochemical engineering, organic and inorganic chemical technology, and quality control. Offered are courses in the fields of economics, management and environmental engineering intended to train the students for the development of cleaner processes on the principles of sustainable development and environmental protection.

The objective is to acquaint the students with the methodology of scientific research, to develop their capacity for the critical analysis and synthesis of various ideas as well as their communication skills to present in writing and orally their ideas, results, and conclusions as well as relevant problems and approaches to problems solving. The ultimate objective is that the study program provides professionals needed for economic progress of the society on the principles of sustainable development as well as professionals who will be able to advance in scientific research.

## Study program outcomes

By completing the master academic study program in Chemical Engineering the students gain the following general knowledge and competences:

- Ability to analyze the problems and independently devise approaches to problem solving on the basis of integrating knowledge from various disciplines with their own judgments;
- Ability to apply methods and procedures of scientific research;
- Capability for applying new ideas and solutions in practice;
- Knowledge of professional ethics.
- Students also gain specific professional abilities in the field of chemical engineering:
- Specialized theoretical and professional knowledge in certain fields of chemical engineering such as chemical processing, pharmaceutical, polymer and electro-chemical engineering, organic and inorganic technology and quality control ;
- Ability for solving complex problems in chemical engineering practice;
- Professional knowledge and abilities needed for monitoring, critical analysis and application of innovations in the field of chemical engineering;
- Competence for the creation and implementation of principles of sustainable development of economy and society.

## Admission requirements

Graduates in academic study programs of at least 240 ECTS.

Materials and consultations in English

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# Environmental Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, [www.tmf.bg.ac.rs](http://www.tmf.bg.ac.rs)

ECTS: 60/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: MASTER

## Study program content

The full course workload of the master academic study program has been assigned 60 ECTS credits. The study program comprises active teaching and research work towards master thesis. Active teaching is delivered in the first semester of study and encompasses compulsory and elective courses in the total workload of at least 30 ECTS credits. In the second semester of studies, the work towards master thesis is carried out and is equivalent to a workload of 30 ECTS credits.

Master work represents a student's scientific-research work in the field of the study program. The goal is that the students gain experience and competence to conduct scientific research independently. The defense of master thesis is public, and both the thesis and defense are evaluated by the committee composed of the supervisor and at least two members.

## Study program goals

The aim of this study program is that students, through a series of courses, gain knowledge required to monitor environmental quality, decrease the pollution in the environment and work place, design systems for purification and remediation of polluted waters, air and soil and treat solid and hazardous waste. Students are trained to understand causes of environmental pollution and to undertake control measures for the pollution prevention or decrease, as well as to manage purification and remediation processes.

Basic fields of the study program include: underground and surface waters quality control, water treatment for the appropriate purposes, waste waters purification; solid and hazardous waste management, waste materials recycling and use; air quality control, exhaust gases purification; monitoring of soil quality and remediation of contaminated soil; energy efficacy, renewable energy sources and sustainable development. In addition, students are provided with knowledge in the areas of economics, management and legal regulations in this field aiming at appropriate environmental protection with minimal costs.

The objectives of this study program are directed towards gaining academic skills and specific knowledge in accordance with current international master academic study programs in environmental engineering. Graduate students of the study program Environmental Engineering, thanks to knowledge and skills gained, are competent to recognize and solve problems of environmental protection in practice.

## Study program outcomes

The knowledge that graduate students gained enable them to plan and conduct experiments, as well as to analyze and interpret data within the framework of appropriate disciplines (air, water, soil quality, waste management, resources preservation and use of materials). It must be pointed out that they are acquainted with the most recent achievements in this field and thus capable, through continual education, to improve the knowledge gained and contribute to the development of this field.

After completion of the study they are able to plan, design, and supervise operation of the systems, equipment and processes that are optimized from the standpoints of quality, costs, time, work safety, and environment and work-place protection.

## Admission requirements

Graduates in academic study programs of at least 240 ECTS.

Materials and consultations in English

## Contact

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# Metallurgical Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, [www.tmf.bg.ac.rs](http://www.tmf.bg.ac.rs)

ECTS: 60/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: MASTER

## Study program content

The full course workload of the master academic study program has been assigned 60 ECTS credits. The study program comprises active teaching and research work towards master thesis. Active teaching is delivered in the first semester of study and encompasses compulsory and elective courses in the total workload of at least 30 ECTS credits. In the second semester of studies, the work towards master thesis is carried out and is equivalent to a workload of 30 ECTS credits. Master work represents a student's scientific-research work in the field of the study program. The goal is that the students gain experience and competence to conduct scientific research independently. The defense of master thesis is public, and both the thesis and defense are evaluated by the committee composed of the supervisor and at least two members.

## Study program goals

The master academic study program Metallurgical Engineering is intended:

- To provide educated engineers, possessing developed organizational capabilities, independence and self-initiative in organizing and managing production processes in the field of metallurgy;
- To stimulate students of the master study program to creative and logical thinking;
- To provide to future master engineers of metallurgy capacities to apply successfully their professional knowledge and specific practical skills gained for solving relevant complex problems;
- To establish stronger links between educational institutions and industry, with the aim of creating specialized engineers in the field of metallurgy;
- To effectively monitor and adopt new technological achievements in the selected areas of metallurgy.

## Study program outcomes

By completing the master academic study program Metallurgical Engineering the students gain the following knowledge and competences:

- Improved knowledge, understanding and specific professional skills in the field of development, production, characterization, and application of new, contemporary, as well as construction metallic materials and products;
- Capacity for the analysis, synthesis and prediction of certain problems in practice, which might have various consequences, as well as for proposing solutions in the field of metallurgy;
- Knowledge and skills for an independent and team work when solving complex problems;
- Ability for integrating the gained knowledge and specific practical skills and dexterities, to help in more prompt solving of problems that might arise in the profession;
- Qualification for efficient monitoring and adoption of new achievements in the field of development, production and application of contemporary, construction metallic materials and products;
- Capability for applying information technology to automation of production processes of new metallic materials;
- Skills for presenting the knowledge gained in the field of metallurgy to fellow professionals and broader public;
- Capability for critical and self-critical thinking and approaches to the profession, with the aim of improving the existing state.

## Admission requirements

Graduates in academic study programs of at least 240 ECTS.

Materials and consultations in English

## Contact

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Telephone: +381 11 337 05 03

Contact e-mail: [tmf@tmf.bg.ac.rs](mailto:tmf@tmf.bg.ac.rs)

# Textile Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, [www.tmf.bg.ac.rs](http://www.tmf.bg.ac.rs)

ECTS: 120/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: MASTER

## Study program content

The full course workload of the master academic study program has been assigned 120 ECTS credits. The study program comprises active teaching and work towards the master thesis. Active teaching is delivered in the first three semesters and encompasses compulsory and elective courses in a total workload of at least 90 ECTS credits. In the fourth semester work towards master thesis is conducted, the workload being 30 ECTS credits.

The master thesis represents the student's scientific research in the field of the study program. The goal is that the students gain experience and competence to conduct scientific research independently. The defense of the master thesis is public, and both the thesis and defense are evaluated by a committee composed of the supervisor and at least two members.

## Study program goals

The master academic study program Textile Engineering is intended to provide engineers with expanded competences, skills and capabilities as well as with specialized knowledge, in particular by studying disciplines in elective modules, so that they might successfully apply their knowledge both in industrial practice and in scientific research.

By solving concrete problems, through the use of scientific methods and procedures, along with the development of critical and self-critical thinking and approaches, the graduates should be able to greatly contribute to the development of the textile and clothing industry.

## Study program outcomes

By completing the master academic study program Textile Engineering a student gains new general and course-specific specialized capacities, such as:

- The understanding and mastering of physicochemical and mechanical processes, procedures and methods in the production

- and exploitation of textile materials and products;
- The ability for the work in industrial conditions in the production of textile materials and products;
- The capability for independent research and scientific work;
- A "scientific-engineering" approach to solving technical and technological problems;
- Communication skills to present results and conclusions clearly as well as to formulate problems and approaches to problem solving;
- The ability to work in a team;
- The ability for improving technological processes through the application of alternative processing equipment and more efficient and cleaner technological solutions.

## Admission requirements

Graduates in academic study programs of at least 180 ECTS.

Materials and consultations in English

## Contact

Head of the study program:  
**Prof. Dr. Ivanka Popović**  
Telephone: +381 11 337 05 03  
Contact e-mail: [tmf@tmf.bg.ac.rs](mailto:tmf@tmf.bg.ac.rs)