

Faculty of Technology and Metallurgy

Metallurgical Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, www.tmf.bg.ac.rs

ECTS: 180/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: PHD

Study program content

Full course workload of the doctoral study program has been assigned 180 ECTS credits. The program of study comprises active teaching and work towards doctoral dissertation. Active teaching is composed of lectures and research work relevant to the study. Active teaching is delivered in the first three semesters. Active teaching in the first year encompasses compulsory and elective courses, the total workload being at least 50 ECTS credits.

Active teaching in the third semester of studies encompasses preparation and sitting for final examination, which is equivalent to a workload of 30 ECTS credits. The final examination is supposed to demonstrate candidate's scientific maturity and also to show scientific justification of the topic of the candidate's doctoral dissertation. Successfully defended final work is a prerequisite for submitting the topic of doctoral dissertation. The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The program of study is intended to educate doctors of science who will have knowledge and capacities to develop new metals and related materials, to design metallurgical processes for their production, characterization and application. A particular emphasis is placed upon the prevention of environmental pollution through the reconstruction of existing metallurgical processes, the development of new metallurgical processes as well as through recycling of waste materials and the development of new, integrated and clean processes of metallurgical production.

In addition, the program of study is also aimed at affording the students knowledge about the role of metallurgical industry in the society and its impact on the environment as well as about the role and responsibility of engineers in the development of the society and improvement of the quality of life.

The ultimate objective is that doctors of science in Metallurgical Engineering are in that way qualified for assuming the leading role both in industry and in scientific research institutions in the field of metallurgy but also, and not of less importance, in social organizations that are dealing with problems of metals and related materials use, development and production, thereby paying a great deal of attention to pollution aspects, environmental protection and sustainable development of the society.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for clear presentation of results and conclusions as well as for formulation of problems and approaches to problems solving;
- Ability for critical and creative thinking, as well as contribution to the development of scientific thought;
- Ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading the scientific research.

Students also gain specific professional abilities in the area of metallurgical engineering:

- Breadth of knowledge and understanding of specific area of metallurgical engineering;
- Professional knowledge for the analysis of existing and new materials as well as metallurgical processes;
- Competence for analyzing pollution sources in metallurgical processes and their impact on the environment as well as competence for problem solving;
- Professional knowledge for the reconstruction of existing and for the development of new, cleaner, integrated and sustainable

production processes in metallurgy, aimed at decreasing pollution and the amount of waste materials;

- Ethical and professional competence for making strategic decisions and establishing of standards aimed at society development.

Admission requirements

Graduates in bachelor and master academic study programs of at least 300 ECTS.

Materials and consultations in English

Contact

Head of the study program:

Prof. Dr. Ivanka Popović

Telephone: +381 11 337 05 03

Contact email: tmf@tmf.bg.ac.rs



Biochemical Engineering and Biotechnology

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, www.tmf.bg.ac.rs

ECTS: 180/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: PHD

Study program content

The full course workload of the doctoral study program has been assigned 180 ECTS credits. The program comprises active teaching and work towards the doctoral dissertation. Active teaching consists of lectures and research work. Active teaching is delivered in the first three semesters. In the first year it encompasses compulsory and elective courses, the total workload being at least 50 ECTS credits.

In the third semester it encompasses preparation and sitting for the final exam, which is equivalent to a workload of 30 ECTS credits. The final examination should demonstrate the candidate's scientific maturity and show scientific justification of the topic of the candidate's doctoral dissertation. A successfully defended final work is a prerequisite for submitting the topic of the doctoral dissertation. The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The aim of the study program is to educate PhDs that will have knowledge and abilities to analyze the effect of different factors on the efficiency of traditional biotechnological processes for the purpose of their upgrading and to assume an active role in the development of new biotechnologies by analyzing and adopting contemporary achievements in this area. Besides, the objective is to train the students to devise new biotechnological processes and systems that produce small amounts of waste materials based on the principles of integrative energy savings.

The program is concerned with both the traditional application of microorganisms and enzymes in industrial biotechnology and with the contemporary trends of the application of biotechnology in pharmacy and biomedicine. The study program provides the students capacities to actively coordinate and participate in the upgrading of traditional biotechnological processes and in the development of new ones, to follow advances in biotechnology in the world and to participate in scientific research.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for the clear presentation of results and conclusions as well as for the formulation of problems and approaches to problems solving;
- The ability for critical and creative thinking, as well as the contribution to the development of scientific thought;
- The ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading scientific research.

Students also gain specific professional abilities in the field of biotechnology:

- Professional knowledge for upgrading the existing production processes;
- Professional knowledge for the development of new integrated biotechnological processes that are based on renewable raw materials and waste materials;
- Professional knowledge and academic skills for critical analysis and evaluation of new complex ideas;
- Competence for work in multidisciplinary teams.

Admission requirements

Graduates in bachelor and master academic study programs of at least 300 ECTS.

Materials and consultations in English

Contact

Head of the study program:
Prof. Dr. Ivanka Popović
Telephone: +381 11 337 05 03
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Chemistry

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, www.tmf.bg.ac.rs

ECTS: 180/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: PHD

Study program content

Full course workload of the doctoral study program has been assigned 180 ECTS credits. The program of study comprises active teaching and work towards doctoral dissertation. Active teaching is composed of lectures and research work relevant to the study. Active teaching is delivered in the first three semesters. Active teaching in the first year encompasses elective courses, the total workload being at least 50 ECTS credits. Active teaching in the third semester of studies encompasses preparation and sitting for final examination, which is equivalent to a workload of 30 ECTS credits.

The final examination is supposed to demonstrate candidate's scientific maturity and also to show scientific justification of the topic of the candidate's doctoral dissertation. Successfully defended final work is a prerequisite for submitting the topic of doctoral dissertation. The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The doctoral study program in Chemistry is intended to educate doctors of science in this field who will have competence to apply knowledge in chemistry in various sectors of economy and society, such as synthesis of new materials, development of new chemical products, development of new chemical analytical methods and alike. Besides, through the scientific research and preparation of the doctoral dissertation along with diversity of topics offered, the objective of the program is to equip the students for critical analysis and solving of complex problems as well as for devising and heading original scientific research.

The ultimate objective of the study program is that the doctors of science in chemistry are trained for assuming a leading role in the advancement of science and practical application of scientific achievements in the area of chemistry and that in this way contribute significantly to the development of the entire society.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for clear presentation of results and conclusions as well as for formulation of problems and approaches to problems solving;
- Ability for critical and creative thinking, as well as contribution to the development of scientific thought;
- Ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading the scientific research.

Students also gain specific professional abilities in the field of chemistry:

- In depth knowledge and understanding of appropriate field of chemistry;
- Ability for applying various instrumental methods and independent use of contemporary research equipment;
- Proficiency in solving concrete problems in practice by applying scientific methods and by devising new, original solutions;
- Ability for establishing various types of scientific collaboration and for maintaining scientific communication.

Admission requirements

Graduates in bachelor and master academic study programs of at least 300 ECTS.

Materials and consultations in English

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Chemical Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, www.tmf.bg.ac.rs

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Study program content

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Active teaching in the third semester of studies encompasses preparation and sitting for final examination, which is equivalent to a workload of 30 ECTS credits. The final examination is supposed to demonstrate candidate's scientific maturity and also to show scientific justification of the topic of the candidate's doctoral dissertation. Successfully defended final work is a prerequisite for submitting the topic of doctoral dissertation. The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The objective of the program of study is to educate doctors of science who will have knowledge and ability to apply engineering principles and basic sciences, such as chemistry, mathematics and physics, for the development of integrated, cleaner and sustainable production processes as well as new products with strictly controlled properties in accordance with contemporary requirements of high living standard, preservation of the environment and development of economy and society on the principles of sustainable development. Thereby, through a broad choice of offered courses, it is aimed that students acquire good basis in fundamental sciences, chemistry in particular, and also in engineering disciplines, especially in chemical engineering. Besides, the study program is designed to confer to the students knowledge about the role of chemical processing industry in the society and its impact on the environment as well as to acquaint them about the role and responsibility of engineers in the development of society and in providing and improving the quality of life.

Finally, through scientific research and preparation of doctoral dissertation, along with a great diversity of offered topics, the program is tailored to train the students for critical analysis and solving of complex problems, as well as for devising and heading original scientific research. The ultimate objective is that doctors of science in Chemical Engineering are provided with capacities for assuming a leading role both in manufacturing organizations and in scientific research institutions in the field of chemical technology, and also in social organizations that are concerned with sustainable development of the society. In this way they will contribute to the development of science and the entire society.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for clear presentation of results and conclusions as well as for formulation of problems and approaches to problems solving;
- Ability for critical and creative thinking, as well as contribution to the development of scientific thought;
- Ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading the scientific research.

Students also acquire specific professional abilities in the field of chemical engineering:

- Proficiency and understanding of appropriate field of chemical engineering;
- Ability for solving chemical engineering problems by applying scientific methods and by devising novel, original solutions;
- Professional knowledge for the critical analysis of existing and the development of novel production processes and products starting from the molecular level to design and management of industrial facilities.

Admission requirements

Graduates in bachelor and master academic study programs of at least 300 ECTS in total.

Materials and consultations in English

Contact

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Prof. Dr. Ivanka Popović
Telephone: +381 11 337 05 03
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Materials Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, www.tmf.bg.ac.rs

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Study program content

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Active teaching in the third semester of studies encompasses preparation and sitting for final examination, which is equivalent to a workload of 30 ECTS credits. The final examination is supposed to demonstrate candidate's scientific maturity and also to show scientific justification of the topic of the candidate's doctoral dissertation. Successfully defended final work is a prerequisite for submitting the topic of doctoral dissertation.

The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The study program is intended to educate doctors of science that will have knowledge and abilities to analyze the existing materials and also to modify them and develop new ones, as well as to assume an active role in the society as torch-bearers of sustainable development.

The objective is that doctors of science of this scientific area may successfully solve problems relative to the use of wide range of materials by introducing materials that are more suitable for specific purposes, thereby honoring the imperatives of energy efficacy and sustainable development, and also by developing new processes for materials processing and recycling as well as by developing new materials.

In addition, the program of study is aimed at equipping the students with the knowledge not only about the role of chemical processing industry in the society and its impact on the

environment but also about the role and responsibility of engineers in the development of the whole society and in giving opportunity for improved and safe conditions of living.

The ultimate objective is that doctors of science in materials engineering are in that way qualified for assuming a leading role both in manufacturing organizations and in scientific research institutions in the field but not of less importance, in social organizations that deal with problems of chemical industry, science and sustainable development of the entire society.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for clear presentation of results and conclusions as well as for formulation of problems and approaches to problems solving;
- Ability for critical and creative thinking, as well as contribution to the development of scientific thought;
- Ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading the scientific research.

Students also gain specific professional abilities in the field of Materials Engineering:

- Proficiency in the analysis of existing materials and possibilities of their application;
- In depth knowledge for modifying existing materials and development of new materials in order to achieve their more efficient use;
- Thorough knowledge and competence for the application of materials engineering in multidisciplinary and interdisciplinary teams;
- In breadth knowledge for participating in the development of new, cleaner, integrated and sustainable production processes.

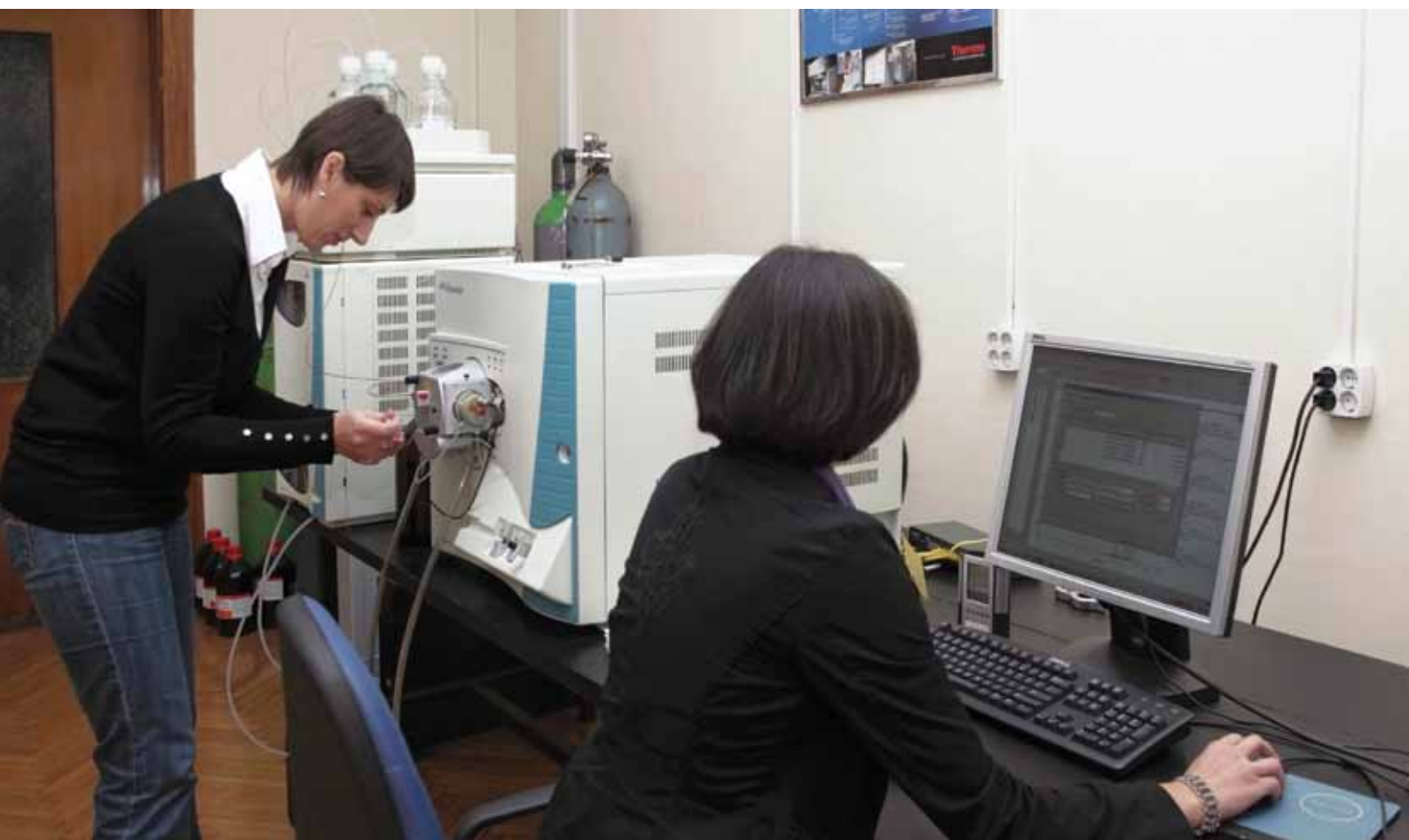
Admission requirements

Graduates in bachelor and master academic study programs of at least 300 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

ECTS: 180/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: PHD

Study program content

The full course workload of the doctoral study program has been assigned 180 ECTS credits. The program of study comprises active teaching and work towards doctoral dissertation. Active teaching is composed of lectures and research work relevant to the study. Active teaching is delivered in the first three semesters. Active teaching in the first year encompasses compulsory and elective courses, the total workload being at least 50 ECTS credits.

Active teaching in the third semester of studies encompasses preparation and sitting for final examination, which is equivalent to a workload of 30 ECTS credits. The final examination is supposed to demonstrate candidate's scientific maturity and also to show scientific justification of the topic of the candidate's doctoral dissertation. Successfully defended final work is a prerequisite for submitting the topic of doctoral dissertation.

The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The objective of the study program is to educate doctors of science who will have knowledge and abilities to analyze the impact of existing industrial facilities on the environment, to solve pollution problems and to assume an active role in the society as torch-bearers of sustainable development. It is aimed that doctors of science of this scientific field may successfully solve problems related to the environmental pollution by the reconstruction of existing production processes, by the development of new purification processes as well as by recycling of waste materials and by the development of new, integrated and cleaner production processes.

This program of study provides the students with capacities to contribute to each of the mentioned segments. In addition, the study program is aimed at offering the students knowledge about the role of chemical processing industry in the society, due to its impact on the environment, as well as about the role and

responsibility of engineers in the development of the society and in giving opportunities for improving the quality of life.

The ultimate objective is that doctors of science in Environmental Engineering are capable for assuming a leading role both in manufacturing organizations and in scientific research institutions in the field of environmental protection but not of less important in social organizations that deal with the problems of pollution, environmental protection and sustainable development of the society.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for clear presentation of results and conclusions as well as for formulation of problems and approaches to problems solving;
- Ability for critical and creative thinking, as well as contribution to the development of scientific thought;
- Ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading the scientific research.

Students also gain specific professional abilities in the field of Environmental engineering:

- Professional knowledge needed for monitoring and evaluating the extent of pollution and the impact of pollutants on the environment and human health as well as for solving pollution problems;
- Professional knowledge for the reconstruction of the existing production processes aimed at decreasing pollution and the amount of waste materials;
- Professional knowledge for the development of new processes of purification and recycling of waste materials;

- Professional knowledge for the development of new, cleaner, integrated and sustainable production processes;
- Ethical and professional competence for establishing standards for the development of cleaner production processes and sustainable development of the society.

Admission requirements

Graduates in bachelor and master academic study programs of at least 300 ECTS.

Materials and consultations in English

Contact

Head of the study program:

Prof. Dr. Ivanka Popović

Telephone: +381 11 337 05 03

Contact email: tmf@tmf.bg.ac.rs



Textile Engineering

at Faculty of Technology and Metallurgy, 4 Karnegijeva, 11000 Belgrade, www.tmf.bg.ac.rs

ECTS: 180/ LANGUAGE OF INSTRUCTION: SERBIAN/ DEGREE: PHD

Study program content

The full course workload of the doctoral study program has been assigned 180 ECTS credits. The program of study comprises active teaching and work towards the doctoral dissertation. Active teaching consists of lectures and research work and is delivered in the first three semesters. In the first year it encompasses compulsory and elective courses, the total workload being at least 50 ECTS credits. In the third semester it encompasses preparation and sitting for the final examination, which is equivalent to a workload of 30 ECTS credits.

The final exam should demonstrate the candidate's scientific maturity and to show the scientific justification of the topic of the candidate's doctoral thesis. A successfully defended final work is a prerequisite for submitting the topic of the doctoral dissertation. The last year of study is dedicated solely to the preparation of the doctoral dissertation.

Study program goals

The objective of the study program is to educate Phds to apply the gained knowledge on fiber structure, manufacturing, properties and the application of biologically active fibers, technical fibers, geotextile and medical textile materials, for an independent formulation of new research ideas in the field of fiber chemistry and technology, as well as for multidisciplinary approaches to new textile materials and technologies.

The program trains candidates in the field of textile engineering to apply engineering approaches to the design of fabric quality parameters, gain necessary knowledge and skills needed to design special-purpose clothing (high - tech materials), master the theory and practice of measuring dyes of polymeric and textile materials, and gain knowledge about new and special processes for the treatment and finishing of textile materials. Finally, the program of study should educate PhDs that will be able to make an adequate choice of technology and to direct procedures of textile material treatment that will ensure minimal environmental pollution.

Study program outcomes

By completing the doctoral study program the students gain general knowledge and competences:

- Knowledge and competence for devising original scientific research;
- Communication and social skills for the clear presentation of results and conclusions as well as for the formulation of problems and approaches to problem solving;
- The ability for critical and creative thinking, as well as a contribution to the development of scientific thought;
- The ability to organize knowledge from various fields into a coherent framework for problem solving;
- Competence for independent and team work, as well as for heading scientific research.

Students also acquire specific professional abilities in the field of textile engineering, such as:

- Professional knowledge for independent formulation of new research ideas in the field of fiber chemistry and technology, as well as for the development of new fibers and special -purpose textile materials;
- Professional knowledge for the choice of contemporary physical and instrumental methods for textile material characterization.

Admission requirements

Graduates in bachelor and master academic study programs of at least 300 ECTS.

Materials and consultations in English

Contact

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