



Approved by
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Academic Council of GTU
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Resolution №01-05-04/79 of the
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dated June 29, 2022

Bachelor's Educational Program

Program Title

მეტალურგია

Metallurgy

Faculty

ქიმიური ტექნოლოგიის და მეტალურგიის

Faculty of Chemical Technology and Metallurgy

Program Head/ Heads

Professor Omar MIKADZE

Qualification to be Awarded and the Extent of the Program in terms of Credits

Engineering Bachelor in Metallurgy

Will be awarded by completing at least 240 credits

Language of Teaching

Georgian

Prerequisite for Admission to the Program

Only the holder of a state certificate proving complete general education, or an equivalent person enrolled in accordance with the procedure established by Georgia law, shall have the right to study at the Bachelor's Educational Program.

Program Description

The program is developed based on recognized theoretical and practical experience in the field and taking into account the requirements of the labor market.

The Educational Program is based on the European Credits Transfer System ECTS system. 1 credit is equal to 25 hours, which includes both contact and independent work hours. The study year equals 60 ECTS credits. The duration of the Program is 4 years (8 semesters). One semester includes 20 weeks.

According to the student's individual workload, the number of credits in one year can be less or more than 60 credits, but no more than 75 credits.

The program consists of natural science, general technical, humanitarian and specialty training courses.

The qualification will be awarded by combining 204 credits of the main specialty and 36 credits of free components in the educational program. 53 credits are allocated to mathematics, natural science subjects (physics, chemistry, biology), in addition, the program includes a group of optional metallurgy subjects (total 11 study courses, 5 credits each), from which the student elects five study courses - a total of 35 credits. 88 credits in total.

21 credits are allocated to general technical subjects;

83 credits are allocated to specialty subjects, among them there is a group of optional technological training courses in the amount of 20 credits (10 training courses - 5 credits each student elects 4 training courses), 5 credits – industrial practice and 5 credits Bachelor's thesis.

26 credits are allocated to humanitarian and economic subjects.

Practice is a necessary component of higher education, which helps the student to become a professional and allows him to develop the acquired theoretical knowledge in a practical environment. Practice gives the student an opportunity to test the acquired knowledge in a real working environment and further refine and develop the acquired competencies. Practice also aims to support students in terms of employment in practice facilities. The program has free components in the amount of 36 credits, including in the VIII semester - free components are divided into groups to facilitate orientation. A student must choose 30 credits in any configuration.

The program ends with the defense of a Bachelor's thesis in environmental engineering, which will establish the student as a specialist corresponding to modern requirements. Information on the organization of the educational process, assessment of student achievements, educational and financial agreements with students, and the accumulation of credits by the student, etc., is provided in the "Instructions for managing the educational process at the Georgian Technical University" .

Program Objective

- In accordance with the mission of the Georgian Technical University, taking into account the experience of foreign programs, as well as the requirements of the labor market, the preparation of a competitive, highly qualified, democratic-humane values-oriented Bachelor of Metallurgy with the ability to adapt to the social environment and communicate.
- To provide basic education in Metallurgy for the understanding of technological processes, thermal operation of metallurgical furnaces, aggregates, calculation, design, understanding of problems and tasks and their practical implementation.
- To study metallurgical methods and means of processing natural raw materials and secondary metals, ferrous and non-ferrous metals, alloys, basic principles and laws of technological process management, safe conduct of technological processes and exploitation of technical and technological means according to environmental protection requirements.

Learning Outcomes/Competences (general and professional)

1. Describes the theoretical and practical aspects of the versatile and specialized field of ferrous and non-ferrous metallurgy.
2. Understands the relationship between the main areas of ferrous and non-ferrous metallurgy technologies
3. Explains the technological regimes and processes of various directions of metallurgy;
4. Applies a wide range of cognitive and practical skills to creatively solve metallurgical problems;
5. Solves the problems of obtaining high-quality metal by using the high-temperature processes characteristic of metallurgy and also the hydrometallurgical method;
6. Based on the knowledge of natural and engineering sciences, as well as technology and mathematics, student will carry out a research or practical project/work in accordance with predetermined guidelines.
7. Collects and interprets important metallurgical data - technological and economic indicators of metal production in heating and electric furnaces, energy consumption in combustion, converter or electric furnaces.
8. Makes a conclusion on the improvement and modernization of the technological process in the field of Metallurgy and develops a project for the creation of new production.
9. Develops and presents a workshop on professional standards, participates in professional debates and discussions.
10. Applies modern information and communication technologies.

Methods of Achieving Learning Outcomes (teaching-learning)

Lecture Seminar (group work) Practical Laboratory Practice Course work/Project Consultation Independent work

In the learning process, depending on the specifics of a particular study course program, the following activities of the teaching-learning methods are used, which are outlined in the relevant study course programs (syllabi):

Discussion/debate; cooperative learning; collaborative work; Problem-based learning (PBL); heuristic method; Case study; Brain storming; role and situation plays; demonstration; inductive; deductive; analysis; synthesis; verbal or oral; written work; laboratory; practical; explanatory; activity-based learning; project development and presentation.

Student's Knowledge Assessment System

The student's knowledge is assessed on a 100-point scale.

Positive grades are:

- **(A)** - Excellent - 91-100 points;
- **(B)** - Very Good – 81-90 points;
- **(C)** - Good – 71-80 points;
- **(D)** - Satisfactory – 61-70 points;
- **(E)** - Sufficient – 51-60 points.

Negative grades are:

- **(FX)** - Failed to pass – 41-50 points, which means that the student needs more work to pass and is allowed to take an additional exam once with independent work;
- **(F)** - Failed - 40 points or less, which means that the work done by the student is insufficient and he/she will have to study the subject again.

In case of getting FX in the component of the Educational Program, GTU is obliged to schedule an additional exam at least 5 days after the announcement of the results of the final exam. The number of points obtained in the final assessment is not added to the grade received by the student in the additional exam.

The grade obtained on the additional exam is the final grade and is reflected in the final grade of the educational program component. In case of receiving 0-50 points in the final evaluation of the educational component, or if the student fails to overcome the minimum competence limit in the final/additional exam, the student will be assigned a grade of F-0. The program part of the assessment of the level of achievement of the student's learning results in each component consists of an intermediate assessment and a final exam. The mid-term assessment in turn includes the ongoing activity and the mid-semester exam.

Each evaluation form and component has a specific share in the final evaluation from the total evaluation score (100 points). In particular, the maximum score of the intermediate assessment is no more than 60, and the maximum score of the final exam is no less than 40. Each form of assessment includes an assessment component/components, which includes an assessment method/methods, and the assessment method/methods are measured by assessment criteria.

The right to take the final exam is given to a student who has accumulated at least the minimum positive grade in the component(s) of the intermediate evaluations (at least 30 points in total), as well as completed and submitted on time the minimum amount of work specified by the program in the form of documentary material.

Detailed information about the evaluation system is provided on the website of GTU "Instructions for managing the educational process at the Georgian Technical University.

Fields of employment

A Bachelor of Engineering in Metallurgy can be employed in a state or private enterprise and institution whose activities are related to the reception and metallurgical processing of ordinary and high-quality metals, alloys in any branch of the country's economy; with effective operation of existing metallurgical aggregates, technological schemes and cycles; with the improvement, intensification and modernization of various metallurgical technologies;

In particular: in the production of ferrous metals - cast iron, steel, ferroalloys, non-ferrous, including precious metals, in metallurgical enterprises, in jewelry production, in aviation production, machine building, in machine-building, electric vehicle-building, wagon-repairing factories, examination of precious metals in banks and pawnshops.

The field of employment of a Bachelor of Metallurgy can be as follows:

- Ferrous metallurgy enterprises:
 - Georgian Manganese LLC - Zestaponi,
 - Rustavi Poladi LLC - Rustavi,
 - Rusmetal LLC - Rustavi,
 - Geoferometal LLC - Rustavi,
 - Nika 2004 LLC - Rustavi,
 - Geosteel LLC - Rustavi,
 - MetalGeorgian ANG Ltd - Rustavi,
 - Chiaturmanganum Georgia LLC (Nakhshirghele, Chishura);
- Non-ferrous metallurgy enterprises and areas of various enterprises:
 - Kvarstiti JSC - Kazreti, Madneuli
 - Jewelry factory Zarapkhana,
 - Aviamsheni - Tbilisi
 - Tbilisi Wagon Repair Factory,
 - Tbilisi Electric Vehicle-building Factory,
 - Uravi mining and chemical plant,
- Institute of Metallurgy and Materials Science of Georgia.
- Scientific research centers of higher education institutions,
- Examination of precious metals in banks and pawnshops.

Opportunities for continuing education

Master's degree educational programs

Human and material resources needed to implement the program

The program is provided with adequate human and material resources. For additional information, please find the attached documentation.

Number of attached syllabi: 81