საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
Resolution № 1234 of the
Academic Council of GTU
dated July 16, 2014

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

PhD Educational Program

Program Title

მეტალურგია
Metallurgy

Faculty

ქიმიური ტექნოლოგიისა და მეტალურგიის
Chemical technology and metallurgy

Program Head/Heads

Professor Zurab Simongulashvili

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

მეტალურგიის დოქტორი (Doctor of Metallurgy) It will be awarded in case of completion of the educational component (50 credits) and the research component of the educational program. Duration of study is not less than 3 years.

Language of Teaching

Georgian

Prerequisite for Admission to the Program

Enrollment in the program is carried out according to the rules established by the legislation of Georgia. The applicant must meet the following requirements:

- □ Master's degree or equivalent in one of the following broad areas of the Fields of Study Classifier: 05 Natural Sciences, Mathematics and Statistics; 07 Engineering, production and construction;
- □ Knowledge of English language at least B2 level. The applicant must pass the entrance exam at the GTU examination center or present a relevant international certificate proving knowledge of a foreign language. An applicant with a higher education in English is not required to present a certificate or pass an exam.

Applicants for enrollment in the program must submit a research project, which outlines the purpose and direction of the applicant's research. Enrollment applicants must pass an interview with the Faculty Temporary Committee, which is approved annually by the GTU Academic Council.

During the selection of applicants, the following are taken into account: the existence of scientific publications, participation in scientific conferences, other documents and materials related to educational/research activities (certificates, deeds, patents, etc.)

The procedure for admission to the PhD program and the enrollment conditions are determined by the "Georgian Technical University PhD Program Regulations" and are posted on the University's website

Enrollment in the educational program is also possible on a mobility basis, in accordance with the order of the Minister of Education and Science of Georgia dated February 2, 2010 No. 10/N "Rule of transfer from a higher educational institution to another higher educational institution".

Enrollment in the educational program is also allowed by the internal mobility rule, considering the prerequisites for enrollment in the program. The terms and procedures of internal mobility are established by the order of the University rector and the information is posted on the University's website.

Program Description

The PhD educational program Metallurgy is a combination of educational and scientific/research components, the learning outcomes of which correspond to the generalized learning outcomes of the 8th level of the qualification determining the difficulty of the qualification in the framework of the national qualifications. The program is made with the ECTS European credit transfer system. At GTU, 1 credit is equal to 25 hours, which includes both contact and independent study hours.

The distribution of credits is presented in the curriculum of the program. The program lasts at least 3 years (6 semesters). The educational component is 50 credits, the mandatory elements of the research component of the program are as follows:

Project/prospectus, colloquium - 1; colloquium - 2; colloquium - 3; preliminary protection; completion and defense of the thesis.

The PhD candidate initiates the research component from the second semester and prepares the research project/prospectus at the first stage. Colloquium - 1 is scheduled in the third semester;

In the fourth semester - colloquium - 2; in the fifth semester - colloquium - 3;

In the sixth semester - completion and defense of the thesis.

The stages of the presented research component are given in a logical order, and overcoming each stage is a prerequisite for each subsequent stage.

Before presenting the thesis to the Dissertation Board, the PhD student is obliged to submit three scientific articles published according to the established rules, one of which must be without co-authors. At least one of the articles published by the PhD student during his studies must be published in a scientific publication indexed in Web of Science, Scopus, Google Scholar.

The scientific-research component is evaluated once, during the defense of the thesis. The regulations of the PhD degree of the Georgian Technical University and the "Educational and research components of the educational programs of the PhD degree and the rules of their evaluation" can be found in detail on the website of the Georgian Technical University.

The academic year consists of two semesters - fall and spring. Mid-semester and final/supplementary exam dates are set at the beginning of each semester by the order of the Rector of the Georgian Technical University based on the "Instructions for managing the learning process at the Georgian Technical University", which is posted on the website of the Georgian Technical University.

Program Objective

The goal of the educational program is:

□ To train qualified metallurgical researchers, oriented to the local and international labor market, equipped with interdisciplinary approaches, knowledge based on the latest achievements, as well as new understanding of existing challenges, research and educational process management skills;

□ To study the latest metallurgical processes modeling, designing, obtaining metals and alloys using modern physical-chemical methods;

□ Training of highly qualified and motivated specialists, which ensures the growth of the country's potential and the competitiveness of metallurgical production by creating innovative alternative technology and research methods for the technical-economic characteristics of obtaining new special purpose metals and alloys.

Learning Outcomes/Competences (general and professional)

□ Generating new ideas for solving research and practical tasks in metallurgical technologies and machinery used in them, including interdisciplinary research, based on critical analysis and evaluation of modern scientific achievements;

□ Experiments in the field of metallurgy by conducting fundamental and applied scientific research in order to obtain high-quality and modern metals demanded in the market, to expand the raw material base and to reduce heating and energy resources;

□ Demonstrates readiness for analysis, generalization and public presentation, including using the latest scientific communication technologies;

□ Discusses new research methods and generalizes them in independent scientific research activities in the field of metallurgy;

□ Applies a modern laboratory and instrumental base to solve current issues of metallurgy, to develop new technologies and to obtain metals that are in demand and competitive in the modern market;

□ Implements measures, pedagogical and scientific research activities focused on the development of knowledge required in the modern labor market in an academic and professional context;

□ Conducts the search, generalization and analysis of information to obtain the necessary set of characteristics for the management of the properties of the structure and materials:

□ Based on the systematic analysis of modern learning methods, he critically evaluates the contradictory ideas and approaches in the learning process. Based on the principles of student-centered teaching;

□ Develops new research and analytical methods and approaches in metallurgy, which are focused on the creation of knowledge in demand in the modern labor market, which is reflected in internationally refereed publications;

□ Adhering to the principles of academic integrity and taking into account innovative methods based on the latest achievements of the field in the field of interdisciplinary research, he prepares research projects in metallurgical technologies and in the design and calculation of machinery and equipment.

Methods of Achieving Learning Outcomes (teaching-learning)

☒ Lecture ☒ Seminar (group work) ☐ Practical Laboratory ☒ Practice
☒ Project ☒ Scientific and thematic seminar ☒ Independent work ☒ Consultation
☒ Research component ☒ Structure of the thesis ☒ Thesis defense

In the learning process, depending on the specifics of a particular study course, the following relevant activities of the teaching-learning methods are used, which are reflected in the programs (syllabi) of the relevant study course:
discussion/debate, cooperative learning, case study, demonstration, analysis, synthesis; verbal or oral, written work; explanatory; action-oriented learning, project development and presentation.

Student's Knowledge Assessment System

Assessment is done on a 100-point system. Assessment
of the learning component:

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.

Evaluation of scientific-research component/components:
a) Excellent (summa cum laude) – excellent work;
b) Very good (magna cum laude) – a result that exceeds the requirements in every way;
c) Good (cum laude) – a result that exceeds the requirements;
d) Average (bene) – an average-level paper that meets the basic requirements;
e) Satisfactory (rite) - the result, which, despite the shortcomings, still meets the requirements;
f) Insufficient – a work of an unsatisfactory level, which cannot meet the requirements due to significant gaps in it;
g) Completely unsatisfactory (sub omni canone) – a result that does not fully meet the requirements.

Fields of employment

With the knowledge acquired within the mentioned program, the graduates will be able to successfully work and grow their careers in ferrous and non-ferrous metallurgy profile enterprises, metallurgical companies, higher education institutions and scientific research institutions, diagnostic design-project construction bureaus and expert laboratories

Human and material resources needed to implement the program

In order to achieve the learning outcomes provided by the program, the infrastructure of the University available to students and the relevant material and technical resources are used. The educational program is provided with relevant textbooks and methodical literature. The University library provides students with relevant printed and electronic textbooks, teaching-methodical and scientific literature, as well as the database of the library's book fund and the electronic catalog posted on the university website. The program is provided with highly qualified human resources. Additional information about the program's human and material resources is provided in the attached documents.

Number of attached syllabi: 7