საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
Resolution № 733 of the
Academic Council of GTU
dated July 6, 2014

Amended by
Resolution № 01-05-02
of the Academic Council of GTU
dated December 29, 2022

PhD Educational Program

Program Title

მასალათმცოდნეობა
Material Science

Faculty

ქიმიური ტექნოლოგიისა და მეტალურგიის
Faculty of Chemical Technology and Metallurgy

Program Head/Heads

Professor Nikoloz LOLADZE

Qualification to be Awarded

Doctor of Material Science It will be awarded in case of completion of the educational component (45 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

A person with a Master's degree or equivalent academic degree, who has been awarded a degree from the following broad areas of the field of study classifier, has the right to study at the PhD educational program Materials Science: 05 Natural sciences, mathematics and statistics; 07 Engineering, production and construction;

The following are considered: the existence of scientific publications, participation in scientific conferences, other documents and materials related to educational/research activities (certificates, deeds, patents, etc.). Those wishing to enroll in the program must submit: a research project, where the purpose and direction of the applicant's research are outlined; Also, a relevant international certificate proving knowledge of the English language at the B2 level, or must pass an exam at the computer center of GTU. An applicant with a higher education in English is not required to present a certificate or pass an exam. In case of receiving a positive assessment in the English language, the applicant goes through an interview with the faculty temporary commission. The procedure for admission to PhD studies and enrollment conditions 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 Materials Science 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 qualifications determining the difficulty of qualifications in the framework of 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 consists of mandatory and optional training courses and in total it amounts to 55 credits, of which the volume of mandatory training courses is 50 credits, and the volume of optional training courses is 5 credits.

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.

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 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".

Program Objective

□ The goal of the PhD program is to prepare students in accordance with international requirements. A competitive, innovative activity-oriented highly qualified specialist in the field of receiving, processing and practical application of materials.

□ To understand the influence of physical-chemical and physical-mechanical conditions of different types of processing of the material on the structural operational characteristics.

□ To acquire the skills of a scientist-researcher, which will allow the PhD candidate to independently plan and implement innovative projects using the existing technologies of receiving and processing materials and the latest research methods.

□ To learn the ability to recognize and critically analyze problems in material science. To study the ways of improving the properties of the latest metallic and non-metallic construction materials used in technology, including composite and nano materials, and prospective areas of their use.

Learning Outcomes/Competences (general and professional)

1. Generates new ideas based on critical analysis and evaluation of the latest scientific achievements in materials science, as an interdisciplinary research field;
2. Determines probable technologies for creation of new and demanding materials with pre-planned properties based on the knowledge of the latest research results.
3. Experiments with fundamental and applied scientific researches in the field of materials science to obtain and process high-quality materials in demand in the modern market;
4. Discusses new research methods and generalizes them in independent scientific research activities in the field of materials science;
5. Applies a modern laboratory and instrumental base to solve current issues, to develop new technologies and to obtain materials that are in demand and competitive in the modern market;
6. Independently plans and develops innovative research, analytical methods and approaches in the field of materials science, which are focused on the creation of knowledge in demand in the modern labor market, which is reflected in internationally refereed publications;
7. Implements measures focused on the development of knowledge in the academic and professional context and critically evaluates the teaching/pedagogical and research activities;
8. Conducts pedagogical activities: lectures-seminars, laboratory works, reviewing scientific studies, preparing publications;
9. Independently makes correct and effective decisions to solve the problem of materials technology. based on new, complex and contradictory ideas and approaches;
10. Adhering to the principles of academic integrity and considering innovative methods based on the latest achievements in the field of materials science research, prepares research projects for receiving, processing and using materials in demand in the market.

Methods of Achieving Learning Outcomes (teaching-learning)

☒ Lecture ☒ Seminar (group work) ☒ Practical ☒ Laboratory
☒ 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; problem-based learning (PBL); demonstration; analysis; synthesis; verbal or oral; inductive; deductive; brain storming; written work; laboratory practical; 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.

The evaluation of the scientific-research component of the PhD educational program is done once, with a final evaluation.

Fields of employment

Educational and scientific research institutions of the relevant profile (in the direction of materials science) - Scientific Research Institute of Materials Science and Metallurgy, Scientific Research Institute of Mining Mechanics; Any company producing organic, inorganic, metallic and non-metallic materials. metallurgical, aviation, automotive profile enterprises; Enterprises of the Ministry of Defense; Chemical industry enterprises; energy companies. Expert and design institutions and organizations of various fields.

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: 12