საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
Resolution № 733 of the
Academic Council of GTU
dated July 6, 2012

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the Academic Council of GTU
dated May 27, 2022

PhD Educational Program

Program Title

ქიმიური და ბიოლოგიური ინჟინერია
Chemical and Biological Engineering

Faculty

ქიმიური ტექნოლოგიისა და მეტალურგიის
Faculty of Chemical Technology and Metallurgy

Program Head/Heads

Professor Teimuraz CHEISHVILI

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

Doctor in Chemical and Biological Engineering It will be awarded in case of completion of the educational component (55 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 is eligible to study at the “Chemical and Biological Engineering” PhD educational program. 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.).

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 committee.

The procedure for admission to the PhD program and the 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 Chemical and Biological Engineering 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 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 student starts preparing the research components from the second semester and develops the research project/prospectus;
Third semester: colloquium - 1;
Fourth semester: colloquium - 2;
Fifth semester: colloquium - 3;
Sixth semester: completion and defense of the thesis.

Before submitting the paper to the dissertation council, the PhD student is obliged to present the papers reflecting the main results of the research related to the dissertation topic and published during the period of the PhD student's studies in accordance with the established rules (at least three scientific articles, at least one of which must be without co-authors). One of the 10 papers can be considered if it has been submitted for publication in a foreign high-rated, peer-reviewed/refereable publication, on which a positive conclusion has been received and relevant supporting documentation has been submitted;

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 objective of the educational program is:

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

□ To study modeling of chemical-technological systems, designing, material processing, using modern physical-chemical methods.

□ Study the planning, design and development of products and processes related to chemical and physical changes, including the planning/design of chemical plants and process control systems.
□ Training of highly qualified and motivated specialists, which will contribute to the growth of the country's potential and the competitiveness of chemical-biological engineering fields, by creating technology and research methods of new/innovative alternative products for obtaining and processing compounds and materials of various functional purposes.

Learning Outcomes/Competences (general and sectoral)

1. Generation of new ideas of chemical and biological engineering for solving research and practical tasks based on critical analysis and evaluation of modern scientific achievements, including in interdisciplinary studies;

2. Experiments in the field of chemical and biological engineering by conducting fundamental and applied scientific researches;

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

4. Discusses new research methods and generalizes them in independent scientific research activities in the field of chemical and biological engineering;

5. Applies a modern laboratory and instrumental base to solve current issues of chemical and biological engineering, to assess development trends, to plan, design and develop products and processes related to chemical and physical changes;

6. Implements measures focused on the development of knowledge in the academic and professional context and critically evaluates the teaching/pedagogical and research activities;

7. Leads the development of innovative research approaches for the perfection of scientific activity, which is focused on the creation of new knowledge;

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

9. Develops new research and analytical methods and approaches of chemical and biological engineering, which are focused on the creation of new knowledge and are reflected in international refereed publications;

10. Develops research projects in the field of chemical and biological engineering in accordance with 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.

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, cooperative learning, case studies, brain storming, demonstration, deductive, analysis, synthesis, verbal or oral, written work, explanatory, action-oriented learning, project development and presentation, simulation, role-playing games.

Student's Knowledge Assessment System

During the teaching of the study course determined by the program, the student's performance is evaluated in accordance with the evaluation system approved by the Order No. 3 of the Minister of Education and Science of Georgia dated January 5, 2007 "On the rules for calculating credits for higher education programs".
The assimilation of the issues provided by the programs (syllabi) of the training courses determined by the educational program is assessed with a 100-point system. The doctoral student is considered to have passed the study course if he/she scores 51 or more points as a result of the mid-term evaluations and the final exam. In case of receiving at least 30 points in the intermediate evaluations, the doctoral student will be allowed to take the final exam.

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

□ Higher schools and educational institutions;

□ Scientific-research institutions;

□ Diagnostic and research laboratories;

□ Management and control of current processes in chemical and biological enterprises.

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: 14