



## Bachelor's Educational Program

### Program Title

ქიმიური და ბიოლოგიური ინჟინერია

Chemical and Biological Engineering

### Faculty

ქიმიური ტექნოლოგიის და მეტალურგიის

Faculty of Chemical Technology and Metallurgy

### Program Head

Professor Nazi KUTSIAVA

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

Bachelor of Chemical and Biological Engineering

will be awarded if at least 240 credits are completed by combining 210 credits of courses with content relevant to the primary field of study and 30 credits of free components;

### 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. Similar educational programs operating in leading European universities were also studied and taken into account, such as:

- Bachelor's degree in Chemical Engineering  
Manresa School of Engineering (EPSEM)
- Bachelor's degree in Chemical Engineering  
Barcelona East School of Engineering (EEBE)
- Bachelor's degree in Chemical Engineering  
Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT)
- <https://www.upc.edu/en/bachelors>
- The University of Edinburgh -  
<https://www.ed.ac.uk/https://www.eng.ed.ac.uk/sites/eng.ed.ac.uk/files/attachments/msc-degree-course/20171110/MSc%20Advanced%20Chemical%20Engineering%20Brochure.pdf>
- <http://www.princeton.edu> - Princeton University, USA
- [www.rpi.edu](http://www.rpi.edu) - Rensselaer polytechnic institute, USA

**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.

Courses of content corresponding to the main field of study amount to 204 credits, among them there are elective courses of chemistry - 25 credits. The student elects 5 study courses of 5 credits each; a group of elective technological training courses in the amount of 20 credits (the student chooses 4 training courses, each with a volume of 5 credits); a group of elective humanities study courses in the amount of 3 credits (the student elects 1 study course, 3 credits each); foreign language in the amount of 20 credits (4 elective foreign language blocks, 5 credits each); 5 credits - Production practice and 5 credits - Bachelor's thesis.

The program has free components in the amount of 36 credits, including in the VIII semester - an elective block of free components - in the amount of 30 credits and two mandatory free components ("Basics of Philosophy" and "Management and Marketing"), 3 credits each.

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 instruction on the management of the educational process of the Technical University of Georgia.

## Program Objective

- To provide the graduate with broad knowledge of the field of chemical and biological engineering, skills and professional competences necessary for the field corresponding to the modern requirements of the labor market;
- To form the graduate student's practical skills of standard analysis of existing technological processes in the field of chemical and biological engineering, understanding of problems and

tasks arising during activity and their implementation in accordance with safe and environmental requirements.

### Learning Outcomes/Competences (general and sectoral)

- Describes the established theories and principles in the field of chemical and biological engineering; purpose of materials used in production, environmental protection and labor safety norms;
- Explains the planning, design and development of products and processes related to chemical and physical changes;
- Applies the fundamentals of chemical plant and control system planning/design;
- Reports the main characteristics of raw materials and finished materials used in various fields of chemical and biological engineering, technological and equipment parts; kinematic and power characteristics;
- Discusses the main processes in the production of chemical and biological products;
- Based on the knowledge of natural and engineering sciences, as well as technology and mathematics, carries out a research or practical project/work in accordance with predetermined guidelines;
- Evaluates the physical-mechanical characteristics of materials and proper functioning of technological devices;
- Selects schemes and technological lines of equipment and machinery used in the field of chemical and biological engineering.
- Makes a conclusion regarding the proper functioning and operation of devices and tools;
- With an audience of specialists and non-specialists, in forms appropriate for the context, using information and communication technologies, produces clear and understandable communication about ideas related to the field, existing problems and ways to solve them.

### 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.

Detailed information regarding the evaluation system is provided on the website of GTU. In the “Instruction on management of the educational process at the Technical University of Georgia”.

## Fields of employment

Chemical and biological technology enterprises – inorganic compounds and household chemical products, cement, glass and ceramic plants, oil refineries, grease plants, pharmaceutical plants, polymer processing plants, expert laboratories for chemical and food production, main oil and gas pipelines, mining and beneficiation plants, food industry enterprises, paint production, electroplating workshops, detergent production, biotechnological profile productions.

## 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: 131**