



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

Amended by  
Resolution № 01-05-04/175  
of the Academic Council of GTU  
dated November 21, 2022

## Master's Educational Program

### Program Title

ფარმაცია

Pharmacy

### Faculty

ქიმიური ტექნოლოგიისა და მეტალურგიის

Chemical Technology and Metallurgy

### Program Head/Heads

Professor Tamar TSINTSADZE

### Qualification to be awarded and program volume by credits

Master of Pharmacy

Will be awarded upon completion of at least 120 credits of the educational program

### Language of Teaching

Georgian

### Prerequisite for Admission to the Program

A person with at least a bachelor's degree or an equivalent academic degree (from the following broad fields of the field of study classifier: 09 health care, social welfare; 06 information and communication technologies; 05 natural sciences, mathematics and statistics; 07 engineering, production and construction; 08 agriculture, forestry, fisheries, veterinary medicine), which will be enrolled on the basis of the results of the master's exams according to the rules established by the legislation of Georgia (the general master's exam and the exam/exams of the specialty defined by GTU - (a complex exam that includes the key issues of fundamental pharmaceutical disciplines). The questions/tests will be posted at the Study Process Management Department of GTU at least one month before the start of the exams.

The applicant must have a certificate confirming the knowledge of one of the foreign languages (English, German, French, Russian) of at least B2 level, or must have a document of completion of a corresponding education course of B2 level. In the absence of a similar certificate or other similar document, the applicant is obliged to take a test in one of the foreign languages at the computer center of GTU.

Enrollment in the program without passing the master's exams is possible according to the rules established by the Ministry of Education and Science of Georgia.

External mobility. Enrollment in the educational program is also possible on a mobility basis, in accordance with the "Procedure for transferring from a higher educational institution to another higher educational institution" approved by Order No. 10/N of the Minister of Education and Science of Georgia dated February 2, 2010;

Internal mobility. Applicants will also be admitted to the educational program on the basis of internal mobility. The terms and procedures of internal mobility are determined by the order of the rector of the university and the information is posted on the university's website.

## **Program Description**

### Duration of study

The duration of the Master's program is 2 academic years, i.e., 4semesters, and includes 120 credits (4 semesters, each semester consists of 30 credits); the semester includes 20 weeks. There are 15 academic weeks (auditory classes) and 5 sessional (mid-semester, final, and supplementary exams) during one semester at GTU. Practice, depending on its specificity, can be carried out both during academic weeks and at other times;

### Program volume in credits

The program is designed according to the European Credit Transfer System (ECTS). According to the system, 1 credit is equal to 25 hours, which includes both contact and independent work hours. The distribution of credits according to subjects is presented in the curriculum. According to the master's educational program, the student masters at least 120 (ECTS) credits. According to the student's individual load, the number of credits in one year can be less or more than 60 credits, but not more than 75 credits.

The educational program includes both educational and research components: educational component - 90 (ECTS) credits, research component - 30 (ECTS) credits;

### Program structure

The program includes:

1. 50 (ECTS) credits for education courses with content corresponding to the primary field of study;

2. Concentrations: (which implies the grouping of education courses with content corresponding to the primary field of study by focusing on a specific topic/issues) - the volume of each concentration is 60 (ECTS) credits, taking into account the completion of the master's thesis and the defense component;

The program includes 3 elective concentrations. The student has the opportunity to choose one of the available concentrations as desired:

Concentration 1 - "Pharmaceutical Analysis",

Concentration 2 - "Industrial Pharmacy",

Concentration 3 - "Pharmaceutical cosmetology and perfumery".

Research component

It involves research work aimed at developing the master's student's ability to make independent theoretical and practical reasoning and conclusions.

The research component is an integral part of the concentration and is completed by focusing on the elected concentration topic/issue.

### **Program Objective**

The goal of the master's program is an in-depth study of pharmaceutical disciplines;

Training of staff with pharmacy practice and scientific-research skills, who will get deep and systematic knowledge and will be able to work independently in the direction of pharmaceutical analysis, industrial pharmacy, pharmaceutical cosmetology and perfumery;

Development of appropriate skills and preparation for work in the field of pharmacy, taking into account the limitations established by the legislation of Georgia.

### **Learning Outcomes/Competences (general and professional)**

1. In accordance with the chosen concentration, he has deep and systematic knowledge of some of the latest methods of qualitative and quantitative analysis of medicinal drugs, perfumes and cosmetics, drug quality control and chemical-toxicological analysis in pharmacy; in the direction of the intended use of GMP and ISO requirements and standards;
2. With the compatibility of program concentrations in pharmaceutical business administration, pharmaceutical technologist, bioethics, pharmacology, natural raw materials used in medicinal, curative-prophylactic cosmetics, toxicological and pharmacological analysis, phyto-raw materials deep systematic knowledge independently carries out complex pharmaceutical activities in an unfamiliar or multidisciplinary environment;
3. By critical analysis of complex or incomplete information (including the latest studies), independently connects the prescription of drugs according to pharmacological groups with indications, contraindications, side effects and dosage schemes of drugs;
4. Conducts independent research - in terms of state policy and legal bases of pharmaceutical activity, organization of pharmaceutical service, research, planning, selection of analysis methods and use of scientific knowledge of medicinal plant, animal and mineral raw materials, innovative development of pharmaceutical production;
5. Makes an adequate conclusion based on the complete data of the results of the toxico-chemical pharmacological and pharmacognostic analysis and, when necessary, takes responsibility for the activities and professional development of the team members;

6. Determines the main indicators of drug biopermeability and factors affecting drug biopermeability; the validity of the information about the medicinal raw materials, the direction of the laboratory-experimental research;
7. Uses: pharmacopoeial methods in the process of independently conducting research, following the principles of academic honesty, using the latest methods and approaches;
8. Independently plans the further directions of continuing his studies and directs them.

In relation to the learning outcomes of the program, by overcoming the groups of subjects focused on a specific topic, the learning outcomes are concentrated in the following narrow direction:

#### Concentration 1- Pharmaceutical Analysis

- On the basis of deep and systematic knowledge, describes directions of pharmaceutical analysis, research and planning of medicinal plant, animal and mineral raw materials, possesses modern approaches to synthesis of substances and materials, research, quality control of medicines.
- Applies qualitative and quantitative analysis of medicinal preparations, instrumental methods of drug analysis, recommended tools for production of practical works, general and private articles in pharmacopoeias, standardization of medicinal products, physiological and biochemical methods of plant analysis;

#### Concentration 2 - Industrial Pharmacy

- Has deep and systematic knowledge in biopharmaceutics, equipment of chemical-pharmaceutical plants, factory technologist of pharmaceutical preparations, industrial biotechnology of pharmaceutical microbiology, in the direction of quality assessment of medicinal product (pharmaceutical product);
- Applies the knowledge gained in pharmaceutical technologies to correctly draw up a recipe, characterize pharmacological groups, analyze mechanisms of action, standardize drugs and substances in enterprises and laboratories, as well as methods for developing new medicinal forms.

#### Concentration 3 - Pharmaceutical Cosmetology and Perfumery

- Has a deep and systematic knowledge of medical microbiology and dermatology, perfumery and cosmetics development technologies and standardization, features, effects of perfumery and cosmetics on the living organism and determination of their effectiveness.
- Applies morphological, physiological and biochemical regularities of microorganisms (bacteria, fungi, viruses) and plants - proven and innovative methods in cosmetology and perfumery in the direction of quality control of perfumes and cosmetics.

## 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):

Activities related to teaching-learning methods: discussion/debate; cooperative learning; group (collaborative) work; problem-based learning (PBL); case study; Brain storming; role-playing and situational games; demonstration method; induction method; deductive method; analysis; synthesis; verbal or oral; written work; explanatory; action-oriented learning; Project development and presentation.

Detailed information about teaching-learning methods and relevant activities is provided on the GTU website.

## 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 the component of the educational program, in case of acceptance of FX, an additional exam is prescribed, not less than 5 days after the announcement of the results. The grade obtained in the additional exam is not added to the mark obtained in the final grade.

**Fields of employment**

In pharmaceutical organizations-institutions, cosmetic, SPA and aesthetic centers, private firms and companies, private and state scientific-research and testing centers and laboratories, where the search for various materials and products of biologically active substances and the monitoring of the quality and production of the existing ones are carried out.

To determine the quality of the product released in central laboratories and pharmacies of private and state enterprises, to control the technological process;

In control-analytical laboratories of biological raw materials and drug quality control;

In individual areas of private and state enterprises, for solving specific problematic issues and establishing the reasons for their occurrence.

**Opportunities for continuing education**

PhD 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:** 37