საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

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

Amended by
Resolution 01-05-04/119 of the
Academic Council of GTU dated
August 14, 2020

Master's Educational Program

Program Title

მათემატიკა
Mathematics

Faculty

ინფორმატიკისა და მართვის სისტემების
Informatics and Control Systems

Program Head/Heads

Professor Sergo KHARIBEGASHVILI

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

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

Teaching Language

Georgian

Prerequisite for Admission to the Program

A person with at least a bachelor's degree or an academic degree equivalent to it, who is enrolled based on the results of the master's exams, according to the rules established by the Georgian legislation, has the right to study in the master's program (general master's exam and specialty exam/exams determined by GTU). Exam questions/tests will be posted on the GTU website at least one month before the commencement of the specialty exams.

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

Program Description

The program is compiled by the European Credit Transfer and Accumulation System (ECTS). At the Georgian Technical University, 1 ECTS credit is equal to 25 hours, which includes both contact and independent work hours. The distribution of credits (ECTS) according to subjects is presented in the curriculum.

The duration of the program is 2 years (4 semesters, 30 credits in each) and total- 120 credits.

The program includes educational and research components.

The educational component includes 85 credits, and the research component - 35 credits (completion and defense of the Master's Thesis).

The Master's Educational Program includes three 80-credit concentrations.

Research component
The research component is assessed once for the completion and defense of the Master's Thesis- 35 ECTS

Academic year schedule:
The academic year consists of two semesters, fall and spring.

Academic year schedule, mid-semester and final/supplementary exam dates are determined at the beginning of each semester by the Rector's order, based on the "Instructions for managing the educational process at the Georgian Technical University".

Program Objective

The objective of the program:

Study and analysis of general mathematical methods based on different conceptual approaches;
Application of general mathematical methods and models in solving theoretical and practical problems of various fields;
Study and use of probabilistic-statistical methods and models to make scientifically based decisions.

Learning Outcomes/Competences (general and professional)

- **Uses** methods of mathematical logic and set theory in various math problems.
- **Analyzes** methods and principles of real variable and complex analysis.
- **Develops** the fundamentals of size theory and applies them to invariant size theory and probability theory.
- **Characterizes** the nature of sets from two different points of view, namely, from the point of view of size theory and from the topological point of view.
- Adequately **selects** and applies the basic methods and principles of complex and functional analysis in the solution of problems of integral equations and mathematical physics, in the problems of construction of the best approximation, in the solution of problems of variational accounting, in problems related to problems of real and harmonic analysis.
- **Analyzes** the correlation between two economic characteristics and estimates the coefficients of the regression line.
- **Analyzes** the correlation between two economic characteristics and estimates the coefficients of the regression line.
- **Uses** the theory of stochastic measures and integrals associated with random functions and predicts and filters stationary processes by means of linear transformations in the Hilbert space of random functions.
- Using software packages, **estimates** coefficients of regression factors and tests hypotheses about their significance.
- **Makes** a presentation to both the academic and professional community in full compliance with academic ethics and integrity standards.

Methods of achieving learning outcomes (teaching-learning)

☒ Lecture ☒ Seminar (group work) ☒ Practical ☐ Laboratory ☒ Practice
☐ Course work/Project ☒ Master's Thesis ☒ Consultation ☒ Independent work

In the educational process, depending on the specifics of a particular study course program, the following teaching-learning methods are used, which are given in the relevant education course programs (syllabi):
Verbal or oral method, analysis method, action-oriented teaching, explanatory method, demonstration method, discussion/debate, deductive method, collaborative work, cooperative teaching, written work method.
The above-mentioned activities of teaching-learning methods are given on the web page of GTU.

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 FX, an additional exam is held, not less than 5 days after the announcement of the results. The grade obtained in the additional exam is not added to the grade obtained in the final assessment
Detailed information is provided on the GTU website: Instruction for managing the educational process at the Georgian Technical University .

Fields of Employment

With the knowledge acquired within the mentioned program, graduates will be able to work in scientific research institutes of a wide profile (mathematics, physics, informatics, economics, biology, geophysics and others), higher educational institutions, departments of financial institutions, engineering laboratories, educational system agencies where mathematical methods are used. Researching the problems of the mentioned fields of science and technology and developing methodical approaches.

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: 35