



საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
Resolution № 1933 of the
Academic Council of GTU dated
February 24, 2016

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Master's Educational Program

Program Title

ბიოსამედიცინო ინჟინერია და სამედიცინო ინფორმატიკა

Biomedical Engineering And Medical Informatics

Faculty

ინფორმატიკისა და მართვის სისტემების ფაკულტეტი

Informatics and Control Systems Faculty

Program Head/Heads

Professor Zviad GHURTSKAIA

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

Master of Biomedical Engineering

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 System (ECTS) 1 credit equals 25 hours, which includes both contact and independent work hours. The distribution of credits is presented in the curriculum. The program lasts 2 years (4 semesters) and includes 120 credits (ECTS). Teaching component - 80 credits and research component - 40 credits.

The program consists of **educational** and **research components**.

The educational component includes 80 credits, and the research component - 40 credits (completion and defense of the master's thesis).

The research component is evaluated once.

Detailed information on the evaluation of the research component is provided in the "Rules for evaluation of the research component of the master's degree program" on the web page of GTU.

Academic year schedule: The academic year consists of two semesters, fall and spring. Academic 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 Georgian Technical University".

Program Objective

The objective of the program is to train specialists in the field of biomedical engineering and medical informatics, within the framework of the joint program of engineering and information science. Students will be prepared to solve the tasks of processing biomedical devices and systems, creating healthcare information systems, biomedical implants and devices, and modeling biomedical systems. The program focuses on providing graduates with a broad, comprehensive higher education that they will use in the field of medicine to develop innovative medical techniques and health information technologies to provide high-quality health care to people.

Learning Outcomes/Competences (general and sectoral)

- **Applies** biomedical engineering and medical informatics eHealth theories and principles to clinical service hardware and software in healthcare.
- **Analyzes** problems typical for biomedical engineering and medical informatics and uses specific methods of solution.
- **Implements** research and practical projects in the field of biomedical engineering and medical informatics based on knowledge of mathematics, biology, engineering and information technology sciences.
- **Conducts** experiments on the state of living systems.
- **Develops** systems, components and process design in relation to biomedical engineering systems.
- **Evaluates** the technical condition of equipment and information systems used in the healthcare sector based on expert evaluation.
- **Determines** compliance of technical characteristics of medical equipment with international standards of safety and operation.

- **Solves** medical-technical problems in a multidisciplinary team of doctors and other health care providers.
- **Protects** professional values and shares ethical responsibility in ensuring the norms of medical ethics.

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 the specific educational course program, the following activities of the teaching-learning methods are used, which are reflected in the relevant course programs (syllabi):

Verbal or oral, analysis, action-oriented learning, explanatory, demonstration, discussion/debate, deductive, group (collaborative) work, cooperative (cooperative) learning, written work.

Activities corresponding to teaching-learning methods are provided 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 receiving **FX**, an additional exam is scheduled, 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 Georgian Technical University:

A student who does not agree with the assessment of the study results has the right to appeal to the dean with a reasoned complaint and request a revision of the results within five working days of being informed of the results of the assessment.

Fields of Employment

With the knowledge acquired within the framework of the program, graduates will be employed in organizations and companies where processing, improvement, and use of devices for various medical purposes are carried out. They will also be able to carry out research projects in clinical-diagnostic centers in cooperation with scientists of various fields, biologists, physiologists, chemists and doctors.

One of the broad areas of their work arrangement is management of complex medical equipment and systems in clinics. There are many vacancies in this field in the field of manufacturing and processing of medical devices; in the field of orthopedic and restorative-rehabilitation engineering; in the implementation of biomedical engineering development projects. Graduates will be employed in the management of the processes of equipping hospitals with medical equipment, in the development of medical information technologies. Graduates of the program will have appropriate knowledge and qualifications for employment in various health care organizations, insurance companies and social agencies, management of health information systems, organization of telemedicine networks and development of mobile health technologies. Graduates can be employed in state and consulting organizations. Namely: LTD "Ivermedi", LLC - "Advanced Medical Technologies", Acad. N. Kipshidze Central University Clinic, Academician Otar Gudushauri National Medical Center, Scientific-Resrach Institute (Acad. F. Todua Clinic), LTD "Evex, LTD "Geo Lab Instruments", "InterLab" LLC, Institutes of Georgian Technical University: A. Eliashvili "Control Systems Institute", V. Chavchanidze Institute of Cybernetics, LLC "Analizkhelsatsko" and others.

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: 17