



საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
Resolution № 921 of the Academic
Council of GTU dated May 21, 2013

Amended by
Resolution № 01-05-04/36 of the
Academic Council of GTU dated
April 18, 2022

Master's Educational Program

Program Title

სამედიცინო ფიზიკა

Medical Physics

Faculty

ინფორმატიკისა და მართვის სისტემების

Informatics and Control Systems

Program Head/Heads

Associate Professor Lali CHAKHVASHVILI

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

Master of Science (MSc) in Physics

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

The applicant must have a certificate confirming knowledge of a foreign language of at least B2 level, or must have presented a document of completion of an education course corresponding to B2 level. In the absence of a similar certificate or other similar document, the applicant will be interviewed in a foreign language. 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

The program includes educational and research components.

Educational component (educational courses), compulsory – 75 ECTS. , elective -10 ECTS.

Research component - 35 ECTS.

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. In each semester, the educational process will be conducted according to the order of the Rector "On the academic schedule of the semester."

Program Objective

- Educating the highly qualified medical physics specialists who will have the theoretical and practical knowledge corresponding to the requirements of the international market for the development of new innovative methods in the field of medical physics.
- Study of physical methods of research (magnetic resonance imaging, computed tomography, ultrasound diagnostics, positron emission tomography, etc.) and the effects of ionizing and non-ionizing radiation used in medical practice.
- Studying the basic norms of nuclear and radiation safety and the safety of working with sources of ionizing radiation, the basic principles of responding to emergency radiation situations.

Learning Outcomes/Competences (general and professional)

1. **Possesses** the ability to solve problems in the use of new, original ideas, computer technologies, medical and electronic equipment based on deep knowledge of current achievements and innovations in the field of medical physics.
2. **Uses** digital image processing and analysis methods with appropriate algorithms for a specific object.
3. **Makes** use of medical imaging research, electronic technologies and modeling methods in the field of medical physics, independently conducts research and makes adequate decisions.
4. Independently **conducts** medical physics research at a modern level (such as magnetic resonance imaging, computed tomography, ultrasound diagnostics, positron emission tomography, etc.) and formulates qualified conclusions
5. **Analyzes** the factors of adverse effects of the use of optical devices in medical technology, irradiation of biological tissues with photons and radiation.

6. **Forms** a qualified and justified conclusion about the condition and functioning of a specific object.
7. **Determines** the interaction of ionizing and non-ionizing radiation with the substance and its use in medicine, the permissible amount of radiation, the transportation of radioactive substances, the handling and implementation of radioactive waste.
8. **Presents** results in effective presentations, prepares written reports on clinical trials.
9. Independently **conducts** further professional development, knowledge transfer and activities in the fields of medical physics in collaboration with groups of scientists in national and international educational, research, technological and industrial centers.

Methods of achieving learning outcomes (teaching-learning)

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

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):

Discussion/debate, collaborative work, case study, demonstration, inductive, analysis, synthesis, verbal or oral, written work, explanatory, action-oriented learning, brain storming, presentation.

Activities corresponding to teaching-learning methods are given on the website of the Georgian Technical University.

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 acceptance of **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.

Fields of Employment

- Expertizing bodies;
- Medical organizations;
- Military objects;
- Both state and private medical clinics;
- Environmental protection organizations;
- Higher educational institutions.

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: 23