



საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

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

Amended by
Resolution № 01-05-04/162 of the
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November 24, 2022

Bachelor's Educational Program

Program Title

საინჟინრო ფიზიკა

Engineering Physics

Faculty

ინფორმატიკისა და მართვის სისტემების

Informatics and Control Systems

Program Head/Heads

Associate Professor Mikheil CHIKHRADZE

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

Bachelor of Engineering Physics

Will be awarded by combining the main specialty (210 credits) and free components (30 credits) in the educational program, if at least 240 credits are completed

Teaching Language

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 educational program is compiled according to the ECTS system, 1 credit is equal to 25 hours, which includes both contact and independent work hours.

The distribution of credits is presented in the curriculum.

The educational program lasts 4 years (8 semesters) and includes 240 credits (ECTS) - 180 credits plus one optional block - 30 credits and free components 30 credits.

The annual educational process is two semesters. A semester includes a combination of academic weeks, a period of conducting supplementary examination(s) and assessment of student achievement on supplementary examination(s). The duration of the semester is 20 weeks. Student evaluation is done through ongoing activities, mid-semester exams and final/supplementary exams. During one semester, there are 15 educational weeks - classroom classes, 1 - mid-semester exam, 1 - submitting documentary material and 3 - sessional (final and additional exams). Mid-semester and final exam dates are regulated before the start of each semester by the Rector's order on the curriculum. In the semester, the student has 30 credits to master according to the curriculum and, accordingly, 60 credits per year.

The educational process at the Georgian Technical University is described in detail in the "Instructions for the educational process at the Georgian Technical University", which is located on the web page and contains information on the organization of the educational process, evaluation of student achievements, educational and financial agreements with students, and the accumulation of credits by students. The study schedule, mid-semester and final/supplementary exam dates are determined at the beginning of each semester by the order of the Rector, the necessary information for students is provided in detail: "Instructions for managing the educational process at the Georgian Technical University"; In the "Rules for Conducting and Evaluating GTU Students' Practices" and "Rules for Performing Bachelor's Research Project/Thesis."

Program Objective

The objective of the program is to provide the graduate with the following:

- Basic knowledge of theoretical and experimental physics and engineering directions, such as medical physics, environmental protection and radiation safety, micro and nanoelectronics, nanotechnology, technical expertise and their adjacent fields;
- The skills and attitudes of conducting engineering and physical experiments, which he/she will need in the future to work in multidisciplinary scientific and industrial fields;
- To continue studying with the acquired knowledge and skills at the next levels of study: Master's and PhD programs;
- Effectively and creatively use the acquired knowledge to develop the field.

Learning Outcomes/Competences (general and professional)

1. **Possesses** a broad theoretical knowledge of the field of engineering physics to solve various problems in the field;
2. **Analyzes** tasks and situations typical for engineering physics using standard and some of the latest methods;
3. **Uses** versatile and specialized theoretical and practical knowledge to solve problems of physical-technical expertise, micro and nanoelectronics and medical physics;
4. **Identifies, formulates** and **analyzes** problems specific to technical and technological processes in engineering physics;
5. **Possesses** practical skills to solve problems arising in the field of physical-technical expertise, micro and nanoelectronics, medical physics in accordance with predetermined guidelines;
6. **Uses** modern computer/information technologies to solve engineering physics problems;
7. **Develops** a different type of project/report in the directions of physical-technical expertise, micro- and nanoelectronics and medical physics in accordance with predetermined guidelines;
8. On the basis of the obtained results, **forms** a justified conclusion about the processes, experiments and/or devices taking place in engineering physics;
9. **Prepares** a detailed written report/presentation about ideas, existing problems, ways to solve them, and conveys information orally or in writing to engineering physics specialists and non-specialists using modern communication technologies.

Methods of achieving learning outcomes (teaching-learning)

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|--|--|--|--|
| <input checked="" type="checkbox"/> Lecture | <input checked="" type="checkbox"/> Seminar (group work) | <input checked="" type="checkbox"/> Practical | <input checked="" type="checkbox"/> Laboratory |
| <input checked="" type="checkbox"/> Practice | <input checked="" type="checkbox"/> Course work/Project | <input checked="" type="checkbox"/> Consultation | <input checked="" type="checkbox"/> 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):

- Discussion/debates
- Cooperative teaching
- Collaborative work
- Brain storming
- Deductive method
- Analysis method
- Inductive method
- Verbal or oral method
- Written work method
- Explanatory method
- Case study
- Demonstration method
- Project development and presentation
- Synthesis method

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 mark obtained in the additional exam is not added to the mark 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

Graduates of the engineering physics Bachelor's program will be able to find employment:

- in research institutes and organizations of the relevant profile;
- in medical institutions/clinics;
- in such private and state institutions that operate in the field of medical physics, micro and nanoelectronics, expertise;
- in the Ministries of Energy, Defense, Health Protection, Education and Science, Internal Affairs and Security, Environment Protection;
- in higher educational institutions/professional educational institutions;

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: 90