Admission Prerequisite

Admission to a Bachelor's degree programme is open only to holders of a state certificate confirming complete general education or an equivalent document who are admitted in accordance with the procedure established by the legislation of Georgia.

Programme Objective

- **Prepare specialists with comprehensive knowledge** of various aspects of physics and engineering; **provide solid basic knowledge** of theoretical and experimental physics to analyse and solve problems arising in engineering physics;

- In view of the growing demand for professionals in physics and engineering, **prepare specialists to work in multidisciplinary** scientific and industrial fields;

- **Prepare Bachelors** in Engineering Physics who will be able to:

  a) Work as professionals in one or more of the following fields: ***medical physics, environmental protection and radiation safety, microelectronics and nanoelectronics, nanotechnology, technical examination and related fields***, at local and regional levels in educational and research institutions, clinics, private and public agencies, government bodies and industry.

  b) Perform assigned functions individually or with a team, considering their acquired experience, ethical standards and sense of responsibility.

  c) Develop professional skills by continuing their studies and obtaining degrees at the appropriate level in fields such as engineering, science, industry and business.

  d) Ensure high-quality services through the effective and creative use of modern equipment and technologies.

Learning Outcomes/Competences (General and Professional)

1. **Demonstrates** broad theoretical knowledge of engineering physics to solve various problems in the field;
2. **Identifies** and formulates problems characteristic of technical and technological processes in engineering physics.
3. **Analyses** tasks and situations characteristic of engineering physics using standard and certain advanced methods;
4. **Applies** ~~possesses~~ practical skills to solve problems in physical and technical examination, microelectronics and nanoelectronics, and medical physics, in accordance with predetermined instructions;
5. **Solves** tasks in physical and technical examination, microelectronics and nanoelectronics, and medical physics, using comprehensive and specialised theoretical and practical knowledge and modern computer/information technologies;
6. **Develops** various types of projects/reports in physical and technical examination, microelectronics and nanoelectronics, and medical physics, in accordance with predetermined instructions;

7. **Formulates** reasoned conclusions on the basis of results obtained concerning processes, experiments and/or equipment in engineering physics;
8. **Prepares** a detailed written report/presentation on ideas, existing problems and their solutions, and communicates information orally or in writing to engineering physics specialists and non-specialists using modern communication technologies.

Student Knowledge Assessment System

Assessment is based 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) - Did Not Pass - 41-50 points, meaning that the student needs more work to pass and is entitled to take one additional examination after independent study;
- (F) - Fail - 40 points or less, meaning that the work completed by the student is insufficient and the student must retake the course.

If a student receives an FX grade, an additional examination is scheduled no earlier than 5 days after the results are announced. The grade obtained in the additional examination is not added to the score obtained in the final assessment. Detailed information is available on the GTU website: Instruction on the Management of the Educational Process at Georgian Technical University.

https://www.gtu.edu.ge/uploads/2026/03/educational-process2.pdf

Course	Credits
Mathematical Analysis 1	5
Physics 1.1	6
Special Course in the State Language	5
Fundamentals of Algorithmisation and Programming	4
Foreign Language	
English Language -B1 (Intensive)	5
German Language - B1 (Intensive)	
French Language -B1 (Intensive)	

Russian Language B1 (Intensive)	
Creative Thinking	5
General Chemistry	4
Mathematical Analysis 2	5
Physics 2.1	6
Foreign Language	
English Language -B2 (Intensive)	5
German Language - B2 (Intensive)	
French Language -B2 (Intensive)	
Russian Language B2 (Intensive)	
Higher Algebra	5
Data Structures and Programming 1	5
Introduction to Philosophy	3
Sociology	
Georgian History and Culture	
Elements of Academic Writing	
Introduction to Psychology	
Principles of Economics	
Fundamentals of Engineering Law	
Mathematical Analysis 3.1	5
Physics 3.1	6
Fundamentals of Processing Measurement Results	5
Object-Oriented Programming – 1 (Based on C++/C#)	5
History of Physics	4
Free Component 1	3
General Fundamentals of MATLAB	5

Ordinary Differential Equations	5
Physics 4.1	6
Free Component 2	3
Vector and Tensor Analysis	5
Programming in Python	5
Theoretical Physics 1	5
Solid-State Physics	5
Fundamentals of Microelectronics	5
Physical Materials Science	5
Fundamentals of Medical Physics	5
Radiation Physics	5
Fundamentals of Nanotechnology	5
Theoretical Physics 2	5
Physics of Semiconductors and Dielectrics	5
Physical Research Methods	5
Radiation Safety of People and the Environment	5
Explosion Analysis and Detection Practice	5
Speciality Elective Module 1	
Ionising Radiation in Medicine	5
Non-Ionising Radiation Imaging in Medicine	5
Optics and Electronics in Medicine	5
Radiation Dosimetry	5
Computer Modelling of Medical Images	5
Sensors: Physics and Technology	
Medical Materials Science	5
Speciality Elective Module 2	

Nanomaterials	5
Solar Energy Engineering	5
Nanodevices and Nanoengineering	5
Consumer Electronics and Servicing	5
Semiconductor Devices	5
Technology of Semiconductor Devices and Chips	
Microprocessor Technology	5
Speciality Elective Module 3	
Physics of Metals	5
Physical Methods of Detecting, Recording and Examining Traces	5
Crystallography	5
Physical and Mathematical Modelling of the Identification of Objects under Investigation	5
Explosion Physics and Diagnostics of Explosion Effects	5
Modelling of Physical Experiments and Technical Diagnostics	5
Practice in Engineering Physics	9
Free component 3	3
Free component 4	3
Mathematical Modelling of Technological Processes and Instruments	5
Physics of the Microworld	5
Application of Artificial Intelligence Tools in Engineering Physics	5
Total	[240]