

Admission Prerequisites

The right to study in the doctoral educational programme is granted to a person holding a Master's degree or an equivalent academic degree who meets the requirements for enrolment in doctoral studies in accordance with the rules in force at the Georgian Technical University (GTU).

A candidate wishing to enrol in the programme must submit:

1. A research project outlining the applicant's research aim and direction;
2. A relevant international certificate confirming knowledge of English at no lower than B2 level, or successfully pass a B2-level English language test organised and administered by GTU. A candidate who has completed a recognised English-language educational programme at any level of higher education is not required to pass the examination or present a certificate (completion of an English-language programme is confirmed by the relevant qualification document, i.e. a diploma);
3. Document(s) confirming previous work/publications in the relevant field and/or participation in scientific research projects and events and/or at least 2 years of work experience in the relevant field.
4. Other documentation/information predetermined by the University on the basis of the Regulations on Doctoral Studies of the LEPL Georgian Technical University.

A candidate whose submitted documentation fully meets the formal requirements is interviewed by the Temporary Faculty Commission. In accordance with the procedure established by the legal acts of GTU, the Temporary Faculty Commission ensures the assessment of persons wishing to be admitted to the programme in compliance with the principles of objectivity, fairness and transparency. Consideration is given to the assessment of the candidate's experience and abilities necessary for the successful completion of the doctoral educational programme, including (where available) the candidate's scientific publications, experience of participation in scientific conferences, and other documents and materials related to teaching/research activities (certificates, diplomas, patents, etc.).

Full information on the rules of admission to doctoral studies and the conditions of enrolment, as well as sample(s) of the English language examination tests, is available on the official website of the University.

<https://gtu.ge/apply/phd.php/>

Programme Goal

- To prepare highly qualified personnel for scientific research and pedagogical activities in such areas of engineering physics as:
 - ✓ Physical Materials Science;
 - ✓ Physics and Technology of Nanosystems;
 - ✓ Micro- and Optoelectronics;
 - ✓ Medical Physics;
 - ✓ Radiation Safety;
 - ✓ Physical and Technical Expertise;
- To develop the skills and competences to apply experimental research and design methods oriented towards the creative solution of topical scientific and technological problems of engineering physics;
- To support the creation and implementation of new knowledge, to prepare scientific and teaching personnel, to bring academic and research resources closer together, and to integrate into the in-

ternational academic and scientific space;

- To support personal and professional development in order to achieve success in the local and international scientific arena.

Learning Outcomes/Competences (General and Professional)

1. **Explains** the key tenets, modern concepts and approaches, and modelling techniques of engineering physics, as well as the development trends of engineering physics.
2. **Defines** the operating principles, technical characteristics, fields of application and possibilities for further modernisation of modern experimental equipment in engineering physics – technological and measuring devices.
3. **Selects** theoretical, measurement and technological methods and software tools for solving topical research and practical problems of engineering physics.
4. **Carries out** computing for engineering physics problems and the modelling of physical phenomena and technological processes.
5. **Conducts** technological processes for obtaining physical systems and structures and advanced materials and nanomaterials, as well as their engineering and the measurement of their characteristics, in compliance with modern standards and avoiding potential risks to people and the environment.
6. **Analyses** the physical and technical characteristics of phenomena and processes occurring in physical systems, and **interprets** and **generalises** them in compliance with the principle of objectivity.
7. **Presents** their own views, the results of the research conducted and expert conclusions in a well-reasoned manner to professional/non-professional interested audiences, using modern communication technologies and with an awareness of social and legal responsibility for the published research materials.
8. Independently **plans** and **conducts** the teaching process in a higher education institution.
9. Independently **directs** further professional development, knowledge transfer and activities in the areas of engineering physics in collaboration with groups of scientists and engineers at national and international educational, research, technological and industrial centres.

Student Knowledge Assessment System

Assessment is carried out on a 100-point scale.

Assessment of the study component

The following are considered positive grades for a study course defined by the doctoral educational programme:

- **(A)** – Excellent – 91% or more
- **(B)** – Very good – 81–90%
- **(C)** – Good – 71–80%
- **(D)** – Satisfactory – 61–70%
- **(E)** – Sufficient – 51–60%

- The following are considered negative grades for a study course defined by the programme:
- **(FX)** – Did not pass – 41–50%, which means that the student needs more work to pass and is given the right to sit an additional examination once after independent work.
- **If FX** is received, an additional examination is scheduled no earlier than 5 days after the announcement of the results. The grade obtained in the additional examination is not added to the points received in the final assessment.
- **(F)** – Failed – 40% or less, which means that the work carried out by the student is not sufficient and the subject must be studied anew.

The scientific research component of the doctoral educational programme is assessed once, by a final assessment. The assessment system of the scientific research component is available at the link:

<https://www.gtu.edu.ge/uploads/2026/03/edu-research-components.pdf>

Assessment of the Scientific Research Component/Components

Five positive and two negative grades are used to assess the doctoral student's dissertation.

Positive grades are:

- Excellent (summa cum laude)** – an outstanding piece of work, 91–100 points
- Very good (magna cum laude)** – a result that exceeds the set requirements in every respect, 81–90 points
- Good (cum laude)** – a result that exceeds the set requirements, 71–80 points
- Average (bene)** – a result that meets the set requirements in every respect, 61–70 points
- Satisfactory (rite)** – a result that, despite shortcomings, still meets the set requirements, 51–60 points

Negative grades are:

- Unsatisfactory (insufficenter)** – a result that does not meet the set requirements due to significant shortcomings, 41–50 points.
- Completely unsatisfactory (sub omni canone)** – a result that completely fails to meet the set requirements, less than 41 points.

Subject	Credits
Academic and Scientific Communication Techniques B	5
Research Methods in Engineering Physics	5
Modelling and Simulation in Physics and Engineering	5
Nanomaterials Science	5
Radiation Physics	
Theoretical Methods for Studying the Electronic Structure of Matter	
Magnetic Resonance Imaging	10
Gas Dynamics	
Geometric Models of Nanostructures	

Semiconductor Photoelectric Converters	5
Positron Emission Tomography and PET-MRI and PET-CT Hybrids	
Shock Wave Physics	
Technology of Crystals and Thin Films of Rare-Earth Element Compounds	
Vapour-Phase Synthesis of Nanomaterials and Their Diagnostics	10
Micro- and Nanotechnologies	
Radiation Safety and Dosimetry	
Physical and Technical Analysis in Forensic Science	
Professor's Assistantship in Engineering Physics	5
Total	50