

Admission Prerequisites

- A Master's degree or an equivalent academic degree diploma in exact, natural science or engineering specialties.
- Successful completion of an interview with the Temporary Faculty Commission. During the interview, consideration is given to scientific publications, participation in scientific conferences, and other documents and materials related to teaching/research activities (certificates, diplomas, patents, etc.).
- A candidate wishing to enrol in the programme must submit a research project outlining the applicant's research aim and direction.
- A relevant international certificate confirming knowledge of English at no lower than B2 level. In the absence of the above-mentioned certificate, the applicant takes an English language examination at the GTU Examination Centre. A doctoral candidate who has completed an English-language (Bachelor's and/or Master's) programme is not required to pass the examination or present a certificate. The rules for admission to doctoral studies and the conditions of enrolment, as well as sample foreign language examination tests, are available on the University website: <https://gtu.ge/News/15285/>
- Enrolment in the programme through mobility is possible twice a year, within the time frames established by the Ministry of Education, Science, Culture and Sport of Georgia, in compliance with the mandatory procedures and the rules established by the University.
- Enrolment in or transfer to the programme from a recognised foreign higher education institution is carried out in accordance with the procedure established by the legislation of Georgia.

Programme Goal

The goal of the doctoral programme is the in-depth study and further development of the methods of applied mathematics (mathematical physics, numerical analysis), pure mathematics (mathematical analysis, discrete mathematics, algebra, geometry and topology) and mathematical statistics, as well as the application of these methods to the analysis and study of mathematical-statistical models of modern technological processes, engineering sciences, information technologies, and medical, banking-financial and social aspects.

Learning Outcomes/Competences (General and Professional)

A holder of the academic degree of Doctor:

- Acquires knowledge based on the latest achievements in the field of study and activity, which makes it possible to expand existing knowledge or apply innovative methods, including in a multi-disciplinary or interdisciplinary context.
- Publishes articles in high-ranking international scientific journals and participates in local and international scientific conferences and scientific programmes.
- Conducts practical classes and seminars in mathematics for Bachelor's and Master's level students.
- Investigates specific theoretical and practical problems arising in the field of mathematical physics, using the properties of function spaces defined on domains with various geometric properties, generalised functions, potentials and the corresponding boundary integral operators.

- Conducts research on the measurability of functions and sets with respect to various classes of measures, on the convergence and uniqueness of single trigonometric, Walsh and Haar series, orthogonal series and multiple series, on the summability of series, on the existence of invariant and quasi-invariant measures and their extendability, and on the uniqueness property, using modern methods of the related theory of metric transitivity (ergodicity).
- Investigates problems of discrete mathematics and applies the latest methods of discrete mathematics in set theory, mathematical logic, point-set theory, game theory, graph theory and combinatorial geometry;
- Constructs computational algorithms corresponding to various mathematical models, performs specific calculations and analyses the results obtained, using modern methods of numerical analysis.
- For various observable stochastic processes, constructs the statistical structure describing them, investigates time series, estimates various statistical parameters, and investigates theoretical and practical problems arising in mathematical models using modern methods of mathematical statistics and probability theory.
- Plans and conducts research in compliance with the principles of academic integrity; develops new research and analytical methods oriented towards the creation of new knowledge (at the level of the standards required for international peer-reviewed publications); participates in research projects based on the latest achievements.
- On the basis of critical analysis, synthesis and evaluation of new, complex and contradictory ideas and approaches, independently makes correct and effective decisions to solve complex problems. Presents and communicates new knowledge clearly and in a well-argued manner both to colleagues and to the wider public. Takes part in thematic discussions held at local and international level.
- Formulates well-founded conclusions and recommendations on problems arising in various fields whose investigation requires the use of mathematical models.

Student Knowledge Assessment System

Assessment is carried out on a 100-point system.

Assessment of the study component:

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, which means that the student needs more work to pass and is given the right to sit an additional examination once after independent work;
- (F) – Failed – 40 points or less, which means that the work carried out by the student is not sufficient and the subject must be studied anew.

Assessment of the scientific research component/components:

- a) Excellent (summa cum laude) – an outstanding piece of work;
- b) Very good (magna cum laude) – a result that exceeds the set requirements in every respect;
- c) Good (cum laude) – a result that exceeds the set requirements;
- d) Average (bene) – a work of average level that meets the basic set requirements;
- e) Satisfactory (rite) – a result that, despite shortcomings, still meets the set requirements;
- f) Unsatisfactory (insufficient) – a work of unsatisfactory level that does not meet the set requirements due to significant shortcomings;
- g) Completely unsatisfactory (sub omni canone) – a result that completely fails to meet the set requirements.

Subject	Credits
Academic and Scientific Communication Techniques B	5
Research Methods in Mathematics	5
Specialised course related to the doctoral programme (the doctoral student chooses only one):	10
Models and Methods of Mathematical Physics 1	10
Selected Topics in the Theory of Functions of a Real Variable	
Selected Topics in Mathematical Logic and Set Theory	
Mathematical Statistics in Economic Models and Forecasting	
Methods for the Approximate Solution of Certain Classes of Differential Equations	
Special Course in Mathematics 1	10
Professor's Assistantship in Mathematics	5
Specialised course related to the doctoral programme (the doctoral student chooses only one):	
Models and Methods of Mathematical Physics 2	10
Additional Topics in the Theory of Series	
Additional Chapters of Discrete Mathematics and Their Applications	
Stationary Statistical Structures	
Additional Chapters of Numerical Analysis	
Special Course in Mathematics 2	15
Total	60