

Iliia State University  
 Faculty of Natural Sciences and Medicine  
 Program Level- Bachelor  
 Physics (Major and Minor)  
 Curriculum

Faculty/School	Faculty of Natural Sciences and Medicine
Program Title	Physics (Major and Minor)
Academic Degree Awarded	Bachelor in Physics
Program Duration/ECTS	8 semesters – 240 credits (1 credit – 25 hours) Main field of study – 120 credits Free component: General Module – 60 credits Minor / Free Components – 60 credits
Launching Date of the Program & Program Update	The program was developed in 2011, updated in 2020. The program can be updated before the start of each academic semester.
Language of Instruction	Georgian
Head/Heads of the Program	Giorgi Japaridze, Professor  Andria Rogava, Professor  Maya Todua, Associate Professor  Nunu Metreveli, Professor
Admissions Requirements	
Those wishing to enroll in the program must have passed the Unified National Examinations in accordance with the regulations established by the Ministry of Education, Science, Culture and Sport of Georgia. Detailed information related to the exams will be posted on the website <a href="http://www.naec.ge">www.naec.ge</a> .	
Program Objectives	
The goal of the program is to equip the graduate with a broad knowledge of the basic principles of physics, laws and essential mathematical aspects of natural science, and to develop basic research skills in one of the directions of physics (fundamental physics, astronomy, atmospheric and near-space physics, biophysics, applied physics) to solve problems of relevant complexity. The program is aimed at developing the skills of oral and written communication, critical analysis, argumentation, individual and team work in Georgian and English languages.	
Learning Outcomes	
Upon the completion of the program: <ol style="list-style-type: none"> <li>1. The graduate can explain the basic principles and laws of physics (including classical mechanics, electromagnetism, statistical dynamics and thermodynamics, wave phenomena and material properties, quantum, atomic and nuclear physics);</li> <li>2. The graduate reveals basic knowledge in one of the fields of physics – Fundamental Physics; Astronomy; Atmosphere and Near Space Physics, Biophysics, Applied Physics;</li> <li>3. The graduate can solve physics problems of relevant complexity applying analytical and numerical methods used in natural sciences;</li> <li>4. The graduate can process and analyze data obtained as a result of experiment/observation;</li> </ol>	

5. The graduate uses appropriate software, including targeted packages, for data analysis/processing, simulation of physical systems, and information retrieval;
6. The graduate can identify and formulate a research problem, conduct research using sector-specific approaches and methods, according to pre-defined recommendations/instructions, adhering to academic and professional ethics within the chosen concentration of physics;
7. The graduate can critically analyze and synthesize information, and draw reasoned conclusions;
8. The graduate can graphically visualize data, communicate effectively orally and in writing on issues related to physics;
9. The graduate can work in the laboratory in compliance with safety rules;
10. The graduate can conduct a multi-faceted assessment of the learning process and correctly identify further learning needs.

### Program Structure

Within the program, the student must accumulate 240 credits in accordance with the structure of the chosen concentration:

Main field of study — 120 credits

Free component: General Module — 60 credits

Minor/free components — 60 credits

General Module:

- Introduction to Contemporary Thought I and II — 12 credits
- Academic Techniques — 6 credits
- English Language Courses — 24 credits
- Introductory Courses — 18 credits (Mathematical Methods of Natural Sciences, Basics of Physics, one introductory course from one of the blocks of introductory courses — Concentration- earth sciences (with the code INTROENGESC) or from the block of life sciences (with the code INTROLF).

Main field of study

✓ General block of the program in Physics — 90 credits

✓ Courses of the selected concentration (including bachelor's thesis) — 30 credits:

Within the framework of the major, a student of the program in Physics has the opportunity to acquire field knowledge in one of the following five concentrations:

- Fundamental Physics;
- Astronomy;
- Atmosphere and Near Space Physics;
- Biophysics;
- Applied Physics.

Minor / free components - 60 credits

### Teaching Methods

- Lecture;
- Seminar;
- Practical method;
- Laboratory method;
- Discussion/debate;
- Individual/group work;
- Demonstration method;

- Elements of e-learning;
- Projects.

### Student Assessment

The assessment is based on a 100-point system. Points will be distributed and defined as follows:

(A) 91-100 Excellent

(B) 81-90 Very Good

(C) 71-80 Good

(D) 61-70 Satisfactory

(E) 51-60 Sufficient

(FX) 41-50 Insufficient – 41-50 points, more work is required to pass and the student is given one more chance to retake the exam through independent work

(F) 0-40 Fail – 40 points and less, considerable further work is required and the student has to repeat the course

The assessment components and criteria are given in the syllabi of the training courses.

### Employability

- Educational and scientific-research institutions of the relevant profile;
- Industrial, communication and transport companies;
- Field of technology;
- Financial and banking sector;
- National Agency of Meteorology and Environmental Protection;
- Climate change and atmospheric events monitoring services;
- Aeronautical Service;
- Medical facilities equipped with bio-medical physical technology;
- Observatory, astronomy and astrophysics research centers;
- General education schools (in the case of one-year Teacher Training Educational Program).

### Teaching and Learning Resources

- Lecture halls
- Educational laboratories
- University library
- Electronic selection system Argus
- Software systems Maple and LabVIEW
- Scientific institutes and centers of the university (Institute of Biophysics, Institute of Theoretical Physics, Center for Space Research, Center for Condensed Matter Theory and Computational Quantum Physics, Center for Computational Helio Research)
- Computer data processing center of Iliauni
- Educational portal e-learning and program Turnitin

#### **Partner organizations:**

- E. Kharadze Georgian National Astrophysical Observatory
- Micro and Nanoelectronics Institute (Delta)
- Ulrich Research Center (Germany)