Annex No. 1

NATIONAL CENTER FOR EDUCATIONAL QUALITY ENHANCEMENT

Accreditation Expert Group Report on Higher Education Programme

Experimental Particle Physics
Master's Program

The University of Georgia

Evaluation Date: June 7, 2023

Final Report Submission Date: August 1, 2023

Tbilisi

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Information about a Higher Education Institution [1]

Name of Institution Indicating its Organizational Legal Form	The University of Georgia (LLC)
Identification Code of Institution	205037137
Type of the Institution	University

Expert Panel Members

Chair (Name, Surname, HEI/Organisation, Country)	Mate Csanad, Eotvos Lorand University, Hungary
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Member (Name, Surname, HEI/Organisation, Country)	-

[1] In the case of joint education programme: Please indicate the HEIs that carry out the programme. The indication of an identification code and type of institution is not obligatory if a HEI is recognised in accordance with the legislation of a foreign country.

I. Information on the education programme

Name of Higher Education Programme (in Georgian)	Experimental Particle Physics
Name of Higher Education Programme (in English)	The University of Georgia
Level of Higher Education	Master's Program
Qualification to be Awarded[2]	Master of Physics
Name and Code of the Detailed Field	0533
Indication of the right to provide the teaching of subject/subjects/group of subjects of the relevant cycle of the general education[3]	-
Language of Instruction	Georgian
Number of ECTS credits	120
Programme Status (Accredited/ Non-accredited/ Conditionally accredited/new/International accreditation) Indicating Relevant Decision (number, date)	new
Additional requirements for the programme admission (in the case of an art-creative and/or sports educational programme, passing a creative tour/internal competition, or in the case of another programme, specific requirements for admission to the programme/implementation of the programme)	-

[2] In case of implementing a joint higher education programme with a higher education institution recognized in accordance with the legislation of a foreign country, if the title of the qualification to be awarded differs, it shall be indicated separately for each institution.

[3] In case of Integrated Bachelor's-Master's Teacher Training Educational Programme and Teacher Training Educational Programme

II. Accreditation Report Executive Summary

- **General Information on Education Pogramme[4]**

This program is new; it is part of the School of Science and Technology of the University of Georgia. In case of accreditation, it will be implemented at the second level of higher education.

In the program, important emphasis is placed on fundamental study of all the main aspects of experimental physics of particles and showing practical examples, which will help the student to be actively involved in the ongoing scientific research in this field both in Georgia and in world-leading scientific research centers and universities abroad.

The aim of the program is to provide the master's students with a deep and systematic knowledge in the field of high energy physics, supported by practical and laboratory work, and also in line with the requirements of the world's leading scientific centers (such as CERN, FZJ, GSI) The program provides highly motivated students with the opportunity to impart advanced knowledge in experimental physics of elementary particles and develop relevant skills.

The program consists of core and elective courses. The total number of credits for the main subjects of the program is 102 credits (72 compulsory courses and 30 credits for the master's thesis). The total number of elective credits is 36 credits, from which the student can choose 18 credits at his/her discretion. Including these, the total number of credits for the program is 120.

- **Overview of the Accreditation Site Visit**

On June 7, 2023, Mate Csanad, Avtandil Tavkhelidze, Tamta Kobakhidze and Davit Putkaradze in person visited the University of Georgia, located in Tbilisi. They meet the Head of international accreditation department, professors (academic staff and invited), Head of the Program, Head of Quality Assurance office, students/graduates and employers. Some staff members, students and employers were able to attend the meetings online. Experts also visited the library, and laboratories to be used for this programme, partly at the Institute of High Energy Physics of the Tbilisi State University.

- **Brief Overview of Education Programme Compliance with the Standards**

The education programme appears to comply with all the standards, at least partly.

The programme clearly establishes the learning objectives and desired outcomes. These are consistent with the mission, objectives, and strategic plan of the HEI. The content of the programme is consistent, and it ensures the achievement of the desired outcomes. There is one minor shortcoming, related to the general physics knowledge of the students, besides specific knowledge in high energy physics.

The prerequisites are clearly stated, and they ensure the success of the programme, except again the general physics knowledge of the students with non-physics background. The programme furthermore provides a student-centered environment, with relevant services available. High level scientific supervision is also provided. Human, material, information, and financial resources of the programme

[4] When providing general information related to the programme, it is appropriate to also present the quantitative data analysis of the educational programme.

are available, and they ensure the sustainability of the programme and the achievement of the objectives. Finally, one may note that the programme utilizes necessary quality assurances.

- **Recommendations**

During the evaluation, the following recommendations were formulated.

- The knowledge of the students in general physics should be confirmed either at entrance or at exit. It is furthermore recommended that either it is made sure that only students familiar with all various aspects of physics (nuclear physics, materials science, physics complex systems, etc.) are admitted, or those without this general knowledge are offered possibilities outside of the mentioned curriculum to be immersed to these other subjects as well. The panel understands that the interview topics will be published one month before the interview at the HEI's website, at https://ug.edu.ge/ge/programs/2; however, these are not available at time of the site visit or the review, so the panel could not confirm the exact topics.
- In addition, it should be made available what kind of knowledge is tested for at the oral examination. It is important to realize that general physics background knowledge is required for a Physics MSc graduates, even if the specialization is in particle physics. Again, the panel understands that this will be available before the actual interviews, but it was not accessible to the panel at the time of the site visit or the review.
- Number of affiliated academic personnel should be increased. Most of the academic personnel are not affiliated with the HEI and are associated with other Georgian universities which poses threat to the sustainability of the program.
- The programme budget should include the rent for the High Energy Physics Institute Laboratory from the Tbilisi State University. (Note that after the site visit, the panel received an updated budget that already contains this item.)
- Laboratory work should be indicated in the syllabus in accordance with the lectures and should not be optional, in other words, every student should take one or more laboratory courses.

- **Suggestions for Programme Development**

During the evaluation, the following suggestions were formulated.

- The programme should make sure that every graduate has a broad understanding of Physics. This can either be confirmed at the entrance exam, or there should be classes for "catching up", which are open to those with lesser physics or mathematics knowledge.
- Modern pedagogical approaches, such as gamification, could be applied in learning and also in learning outcome assessment.

- **Brief Overview of the Best Practices (if applicable)[5]**

One best practice can be mentioned: the close connections to the world-leading relevant labs, in particular to CERN, and the programme involvement of Georgian scientists in the highest-level research in this direction. This ensures the immersion of the students in the most up-to-date research possible, as well as cutting-edge technology.

[5] A practice that is exceptionally effective and that can serve as a benchmark or example for other educational programme/programmes.

- Information on Sharing or Not Sharing the Argumentative Position of the HEI

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- In case of re-accreditation, it is important to provide a brief overview of the achievements and/or the progress (if applicable)

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III. Compliance of the Programme with Accreditation Standards

1. Educational Programme Objectives, Learning Outcomes and their Compliance with the Programme

A programme has clearly established objectives and learning outcomes, which are logically connected to each other. Programme objectives are consistent with the mission, objectives and strategic plan of the HEI. Programme learning outcomes are assessed on a regular basis to improve the programme. The content and consistent structure of the programme ensure the achievement of the set goals and expected learning outcomes.

1.1 Programme Objectives

Programme objectives consider the specificity of the field of study, level and educational programme, and define the set of knowledge, skills and competences a programme aims to develop in graduate students. They also illustrate the contribution of the programme to the development of the field and society.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The programme has clear objectives and learning outcomes described in the Self Evaluation Report. While the description is brief, during the Site Visit it became clear what the core objectives are. These include a deep and practically applicable knowledge in the field of particle physics, specifically in the high energy physics subfield. Furthermore, collaboration in large international experiments is also an objective, as well as conducting independent research.

A more complete summary of the programme objectives, logically connected to each other, and building on each other, is:

1. Acquire deep and systematic knowledge in high energy particle physics.
2. Understand modern experimental research programs and be able to participate in them.
3. Be ready to collaborate with internationally world-leading institutes, such as CERN or GSI)
4. Continue research and studies at the postgraduate level, in a PhD programme.
5. Be employed in research centers or laboratories in Georgia or abroad.
6. Perform basic research or innovation, based on the laboratory work performed.

It is important to underline that students will be able, upon completing the masters programme, apply for a PhD programme in Georgia or internationally, and start a successful scientific career. Alternatively, the learning outcomes delivered in this programme would allow the students to engage themselves outside of basic research.

The set of skills and competences that they acquire will make it possible for the students to contribute to the development of the field, or in general to society, through research and innovation.

Furthermore, upon investigation of the Mission, Vision, and Values of the HEI, it can be clearly stated that the program is in absolute compliance with them, and it aids the mission of the HEI when striving towards institutional excellence. In particular, such a high-level science program is necessary for the HEI to be a leading university in the region, associated with highest standards of research. The HEI also aims to be the most

innovative university in Georgia, and the highest possible innovation standards at CERN are definitely providing a way to achieve this vision.

The most important point, however, is that for the University to participate in world-leading science in the field of high energy particle physics, such as the ATLAS experiment at CERN, they need trained students. The core programme objective is to achieve this, train students to be able to participate in this cutting-edge research program.

Evidences/Indicators

- Self Evaluation Report
- Interviews with the Programme and University Leaders
- Visits in various labs
- UG website, declaration of Mission, Vision, and Values

Recommendations:

- None

Suggestions for the Programme Development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
1.1 Programme Objectives	☒	☐	☐	☐

1.2 Programme Learning Outcomes

➢The learning outcomes of the programme are logically related to the programme objectives and the specifics of the study field.

➢ Programme learning outcomes describe knowledge, skills, and/or the responsibility and autonomy that students gain upon completion of the programme.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The programme learning outcomes are logically related to the programme objectives.

The learning outcomes, stemming from the programme objectives listed in section 1.1. of the Expert Group Report, are the following.

1. Graduated students are familiar with the basics and also the deeper details of high-energy particle physics: from field theory and quantum physics through modern programming to particle detectors and accelerators.
2. They are furthermore familiar with large-scale high-energy particle physics experiments, how they work, and what their scientific methods and purposes are.
3. Successful students could join world-class experiments at international laboratories such as CERN, J-PARC, GSI, Dubna, etc.
4. They can successfully apply for PhD positions at various local and international institutions, they can write grant applications and full-scale scientific papers.
5. They would be able to perform well in non-basic research as well, in various research laboratories.
6. They will have the potential to innovate in fields close to science of particle physics.

These outcomes are fully in line with standards of education in particle physics.

What the learning outcomes lack somewhat is a general education in physics. A graduate with the degree of a Physics MSc should be familiar with physical sciences in general. While those with a previous Physics BSc (or similar) degree might have these abilities at the incoming stage as well, those with an Engineering degree may not – and, the quality of Physics BSc education may vary, so this program should make sure everyone has a general understanding of physics, from quantum mechanics through complex systems to materials and biophysics. This should include a deep practical ability in calculus, complex functions, and other important fields of mathematics.

Evidences/Indicators

- Self Evaluation Report
- Interviews with the Programme and University Leaders
- Visits in various labs
- UG website, declaration of Mission, Vision, and Values

Recommendations:

- None

Suggestions for Programme Development

- The programme should make sure that every graduate has a broad understanding of Physics. This can either be confirmed at the entrance exam, or there should be classes for "catching up", which are open to those with lesser physics or mathematics knowledge.

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
1.2 Programme Learning Outcomes	☒	☐	☐	☐

1.3 Evaluation Mechanism of the Programme Learning Outcomes

- Evaluation mechanisms of the programme learning outcomes are defined; the programme learning outcomes evaluation cycle consists of defining, collecting and analyzing data necessary to measure learning outcomes;
- Programme learning outcomes assessment results are utilized for the improvement of the programme.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The Self Evaluation Report lists a Learning Outcomes Assessment Map that shows how all program outcomes are aligned with relevant courses and activities that assess these outcomes. Note however, that no such map is included in the materials. Instead, details for the assessment map are given in the provisions – and these of course were discussed during the Site Visit.

Based on these, the most important descriptor of the evaluation mechanisms is that both homework as well as laboratory work are used as forms of assessment during the study period of the semester. As many courses discuss and teach modern experimental tools, related to electronics and programming, it is important to assess learning outcomes via supervised laboratory work, and this is fully realized in the programme plans.

Other, for example most European educational institutions share a similar approach. Note however, that in some cases, gamification or similar, modern pedagogical approaches are applied in world-leading institutes for learning outcome evaluation. This programme lacks this aspect, and such details could be added in the future.

It is important to note furthermore that grade assessment and score limits are well detailed in the mentioned provisions.

In summary, the evaluation mechanisms of the programme learning outcomes are clearly defined. The necessary data are given, collected, and analyzed to measure the level of satisfactoriness of the learning outcomes.

Evidences/Indicators

- Self Evaluation Report
- Interviews with the Programme and University Leaders
- Provisions

Recommendations:

- None

Suggestions for the Programme Development

- Modern pedagogical approaches, such as gamification, could be applied in learning and also in learning outcome assessment-

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements

1.3 Evaluation Mechanism of the Programme Learning Outcomes	☒	☐	☐	☐

1.4. Structure and Content of Education Programme

- The Programme is designed according to HEI's methodology for planning, designing and developing of education programmes.
- The Programme structure is consistent and logical. The content and structure of the programme ensure the achievement of programme learning outcomes. The qualification to be granted is consistent with the content and learning outcomes of the programme.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The structure and content of the education programme investigated here is designed according to the educational program of the HEI. According to the Self Evaluation Report and discussions during the Site Visit, master programmes from leading HEIs were also considered.

The main structure of the Master of Physics programme, with specialization in high energy particle physics, follows thus international best practices. Students will be exposed to the necessary knowledge in both theoretical as well as experimental subjects. The mandatory courses in theoretical high energy physics are:

- Symmetries and Group Theory
- Relativistic Kinematics of Particle Interaction
- Particle Physics
- Mould Theories of the Field and Standard Model
- Standard Model and Beyond the Standard Model

The latter (experimental) subjects are:

- Elementary Particles Accelerators
- Elementary Particles Detectors
- Elementary Particles Detectors II
- Particle Physics Data Analysis Method
- Deep Analysis of the Data

There are furthermore enrichment type of subjects:

- Research Seminar
- Management of Research Projects

Finally, there are elective courses; students shall successfully complete three out of the below six courses:

- C++ I
- C++ II
- Applied electronics I

- Applied electronics II
- Numerical Methods
- Targeted English Language (Physics)

Such a structure ensures the successful achievement of the programme learning outcomes. Worldwide leading institutes offer a similar structure of courses.

It can also be noted that the qualification of Physics MSc to be granted is mostly consistent with the content and learning outcomes of the programme. However, an overview of other physics subjects, such as nuclear physics, materials science, etc, is also important, and a bearer of a Physics MSc degree should be familiar with these as well.

Evidences/Indicators

- Self Evaluation Report
- Programme and Syllabus
- Interviews with the Programme and University Leaders
- Visits in various labs
- UG website

Recommendations:

- It is recommended that either it is made sure that only students familiar with all various aspects of physics (nuclear physics, materials science, physics complex systems, etc) are admitted, or those without this general knowledge are offered possibilities outside of the mentioned curriculum to be immersed to these other subjects as well. Note that the panel understands that the interview topics will be published one month before the interview at the HEI's website, at https://ug.edu.ge/ge/programs/2; however, these are not available at time of the site visit or the review, so the panel could not confirm the exact topics.

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
1.4 Structure and Content of Educational Programme	☐	☒	☐	☐

1.5. Academic Course/Subject

➢ The content of the academic course / subject and the number of credits ensure the achievement of the learning outcomes defined by this course / subject.

➢ The content and the learning outcomes of the academic course/subject of the main field of study ensure the

achievement of the learning outcomes of the programme.
➢ The study materials indicated in the syllabus ensure the achievement of the learning outcomes of the programme.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The contents of the academic courses and subjects, as well as the corresponding credits are given in detail in the Programme and Syllabus part of the Self Evaluation Report documentation. These make it clear that the learning outcomes for the given course, as well as that of the programme, can be achieved.

The theoretical physics subjects help the students get acquainted with all the details needed to pursue high-energy physics. This is in detail proven by:

- the course content descriptions,
- the course goals,
- the learning outcome description,
- the course methods,
- and the lecture literature as well.

As study materials, leading international materials are given, and these are also available in the library.

The experimental courses are performed in laboratories having excellent equipment. This means that the students will get a training that ensures that they are able to perform world-class science in leading laboratories. This confirms that the learning outcomes in these subjects can be met.

Evidences/Indicators

- Self Evaluation Report
- Programme and Syllabus
- Interviews with the Programme and University Leaders
- Visits in various labs
- Visit in the UG library
- UG website

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
1.5. Academic Course/Subject	☒	☐	☐	☐

Compliance of the Programme with the Standard

1. Educational programme objectives, learning outcomes and their compliance with the programme	Complies with requirements	☒
	Substantially complies with requirements	☐
	Partially complies with requirements	☐
	Does not comply with requirements	☐

2. Methodology and Organisation of Teaching, Adecuacy of Evaluation of Programme Mastering

Prerequisites for admission to the programme, teaching-learning methods and student assessment consider the specificity of the study field, level requirements, student needs, and ensure the achievement of the objectives and expected learning outcomes of the programme.

2.1 Programme Admission Preconditions

The HEI has relevant, transparent, fair, public and accessible programme admission preconditions and procedures that ensure the engagement of individuals with relevant knowledge and skills in the programme to achieve learning outcomes.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The programme preconditions and procedures are clearly outlined in the Self Evaluation Report and the attached Provisions. These indicate that the HEI has relevant, transparent, and fair admission guidelines and procedures. Their public and accessible availability can only be confirmed once the programme starts, but it is understood that these will be made public according to regulations.

The most important part of these preconditions is that graduates of three bachelor programs will be admitted:

- Bachelor of Physics (or of Physical Sciences, this is equivalent)
- Bachelor of Engineering Physics
- Bachelor of Electrical and Electronic Engineering

It is certain that students with these degrees can indeed successfully deliver the described learning outcomes. For students with affinities in engineering, the experimental directions (detector development and related innovations) would be most suitable, in fact such students are eagerly sought for in high-energy physics experiments. However, it shall be made sure that students without extensive studies in general physics also have the necessary abilities and competencies a Physics MSc graduate shall have.

The Self Evaluation Report furthermore confirms that the enrollment will be carried out based on prerequisites outlined in accordance with Georgian regulations. English proficiency will be made sure; furthermore, an oral interview will be performed. This is an excellent point, as the necessary physics knowledge can be confirmed.

Evidences/Indicators

- Self Evaluation Report
- Programme and Syllabus
- Interviews with the Programme and University Leaders
- Provisions

Recommendations:

- The topics of the interview (if physics background knowledge is tested) should be made transparent, fair, and public. It is important to realize that general physics knowledge is required for a Physics MSc graduate, even if the specialization is in particle physics. Again, the panel understands that these topics will be available before the actual interviews, but it was not accessible to the panel at the time of the site visit or the review.

Suggestions for the programme development

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Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
2.1 Programme Admission Preconditions	☐	☒	☐	☐

2.2. The Development of Practical, Scientific/Research/Creative/Performing and Transferable Skills

Programme ensures the development of students' practical, scientific/research/creative/performing and transferable skills and/or their involvement in research projects, in accordance with the programme learning outcomes.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

In the master's program, a significant emphasis is placed on scientific research and practice. Each student has a curator from the academic or visiting staff involved in the study program, who will help the student to be involved in some international scientific research project. In addition, during the summer, students will have the opportunity to participate in the summer schools of CERN and other European science centers, and most importantly, successful students will complete their master's thesis at CERN.

Outside the program, students are given the opportunity to engage in various research directions, implement their own innovative ideas in the start-up factory and Idea lab, participate in student conferences, competitions, implement their own practical projects through clubs, and receive university funding.

Evidences/Indicators

- Program
- Projects (student projects, master's projects)
- idealab electronics laboratory; startup factory
- Interview results

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Please, evaluate the compliance of the programme with the component

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
2.2.The Development of practical, scientific/research/creative/performing and transferable skills	☒	☐	☐	☐

2.3. Teaching and Learning Methods

The programme is implemented by use student-oriented teaching and learning methods. Teaching and learning methods correspond to the level of education, course/subject content, learning outcomes, and ensure their achievement.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The learning methods indicated in the syllabi of the master's courses are diverse and fully correspond to the topics covered by the syllabi. In addition to traditional lecture-seminars, each lecture course includes interaction, the lecturer uses audio and video material to highlight the lecture, students have the opportunity and resources to work on the literature, find the necessary material in the books in the library or in electronic form.

In lecture courses, the teaching material includes problem-solving oriented exercises in an integrated form, in addition to this, students constantly have to discuss and analyze news and various types of technological readings with lecturers and other students, critically evaluate each other's work, including small-scale scientific research. Part of the subjects have laboratory works, during the performance of which action-oriented teaching methods are used, as well as the demonstration method, however, since the syllabus does not specify practical and

laboratory works, it is difficult to say how much the specified "teaching-learning methods" are used, and how Achieving mastery of component content.

Evidences/Indicators

- program
- Syllabus
- Interview results

Recommendations:

- Laboratory work should be indicated in the syllabus in accordance with the lectures and should not be optional, in other words, every student should take one or more laboratory courses.

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
2.3. Teaching and learning methods	☐	☒	☐	☐

2.4. Student Evaluation

Student evaluation is conducted in accordance with the established procedures. It is transparent, reliable and complies with existing legislation.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

Student evaluation is carried out according to the procedures established by the study course defined by law (60% midterm evaluation and 40% final evaluation). Forms of assessment are quiz, colloquium, mid-term exam, presentation, report, practical assignment.

The type of survey can be written, oral, computer exam, practical assignment. Assessment criteria are described in specific syllabi. The student has the opportunity to receive information about the evaluation of the paper from his own My UG system profile, to see the lecturer's comments on each subject. At the time of the interview, the student's UG profile did not show the specific evaluation criteria and what grade he received in which activity.

The student can appeal the work and receive a reasoned response regarding the assessment. Each syllabus details both assessment forms and assessment criteria.

The evaluation of the master's thesis, "On the approval of the method of calculation of credits for higher education programs" in accordance with the order N3 of the Minister of Education and Science of Georgia, is

done once, in the form of a final evaluation. The preparation of a master's thesis at the University of Georgia is regulated by the regulation of master's studies.

Evidences/Indicators

- program
- courses
- online UG system
- Results of the interview

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
2.4. Student evaluation	☒	☐	☐	☐

Compliance with the programme standards

2. Methodology and Organisation of Teaching, Adequacy of Evaluation of Programme Mastering	Complies with requirements	☐
	Substantially complies with requirements	☒
	Partly complies with requirements	☐
	Does not comply with requirements	☐

3. Student Achievements, Individual Work with Them

The programme ensures the creation of a student-centered environment by providing students with relevant services; promotes maximum student awareness, implements a variety of activities and facilitates student involvement in local and/or international projects; proper quality of scientific guidance is provided for master's and doctoral students.

3.1 Student Consulting and Support Services

Students receive consultation and support regarding the planning of learning process, improvement of academic achievement, and career development from the people involved in the programme and/or structural units of the HEI. A student has an opportunity to have a diverse learning process and receive relevant information and recommendations from those involved in the programme.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

As a result of familiarization with relevant documents, interviews with the administration of the University of Georgia, program leaders, teaching staff and students of the adjacent educational bachelor's program, it became clear that the student receives counseling on the planning of the educational process, academic achievements, teaching improvement and employment. Interviews with academic and invited staff convinced the group of experts that the people involved in the implementation of the educational program ensure the provision of appropriate information to students, both through the counseling hours allocated to them and by using various social platforms. Through electronic services, the university provides students with information about vacancies and helps with the internship process with partner employers. However, it is better to organize meetings with employers for students, which will allow students to establish personal communication with employers and get to know the requirements of the labor market, and the program itself will receive improved feedback from employers regarding the development of the program. Accordingly, experts advise that the university should arrange meetings between students and employers. During the interview, the students of the program noted that they did not have any communication problems with the lecturers, moreover, both in the university and in the electronic mode, the academic staff provides appropriate consultation and assistance to the students, whether it is issues related to the educational process or support in projects outside the curriculum. The University of Georgia provides appropriate services for students. Students get relevant services through the My UG portal where they can understand and appeal their grades and avail various services. During the interviews, the participation of students of related specialties in international mobility, exchange projects or international student scientific conferences was confirmed, they noted that they actively participated in student conferences and scientific activities in Georgia after Idealab was launched at the university, where students actively work on their scientific projects, be it undergraduate, master's project or other scientific work.

Evidences/Indicators

- procedures related to the University's student services
- self-assessment document
- Results of interviews with students and graduates
- educational program

Recommendations:

- None

Suggestions for Programme Development

- It is advised that the university arranges meetings between students and employers.

Evaluation

Please, evaluate the compliance of the programme with the component

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements

3.1 Student Consulting and Support Services	☒	☐	☐	☐

3.2. Master's and Doctoral Student Supervision

- A scientific supervisor provides proper support to master's and doctoral students to perform the scientific-research component successfully.
- Within master's and doctoral programmes, ration of students and supervisors enables to perform scientific supervision properly.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

According to the regulation of master's studies in force at the University of Georgia, the supervisor of the master's thesis is a representative of the university's academic or invited staff.

Interviews with supervisors and students of master's theses confirmed that in the process of writing a master's thesis, a master's student has a qualified supervisor and, if necessary, one or more co-supervisors who have scientific and research experience relevant to the research topic, which is confirmed by the personal affairs of academic staff and their research and practical by activity.

The topic's selection is done based on the reconciliation of the student and the potential supervisor's opinions. Supervisor and potential supervisor are selected based on the specifics of the research topic. The supervisor has regular consultations with the student, for which consultation hours are allocated in the workload. The frequency of consultations corresponds to the specifics of the research topic. The supervisor advises the student in preparing the theoretical part of the paper and in scientific research activities. The supervisor not only advises the student in the research process but also helps participate in scientific events and present the results. Within the visit's framework, master's theses provided by the institution were studied, most of which were interesting and correct in topic and performance.

Data related to the supervision of master's/ doctoral students	
Quantity of master's theses	**10/year (from 2026)**
Number of master's students	**10 in each year of studies**
Ratio	**1**

Related to the above table, note that UG expects to admit 10 students per year, so (except for dropouts) one can expect 10 theses per year from 2026. There will also be 10 students in each year of studies. One can compare this to the number of supervisors, discussed in 4.2, which is 3; so the students to supervisors ratio is 3.33. Note however that outside staff can also act as consultant and as a person responsible for the training, while affiliated personnel can act as the person formally responsible for the thesis within the HEI.

Evidences/Indicators

- educational program
- program self-evaluation report
- Results of the conducted interview

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
3.2. Master's and Doctoral Students Supervision	☒	☐	☐	☐

Compliance with the programme standards

3. Students Achievements, Individual Work with them	Complies with requirements	☒
	Substantially complies with requirements	☐
	Partly complies with requirements	☐
	Does not comply with requirements	☐

4. Providing Teaching Resources

Human, material, information and financial resources of educational programme ensure sustainable, stable, efficient and effective functioning of the programme and the achievement of the defined objectives.

4.1 Human Resources

➢ Programme staff consists of qualified persons, who have necessary competences in order to help students to achieve the programme learning outcomes.
➢ The number and workload of programme academic/scientific and invited staff ensures the sustainable running of the educational process and also, proper execution of their research/creative/performance activities and other assigned duties. Quantitative indicators related to academic/scientific/invited staff ensure programme sustainability.
➢ The Head of the Programme possesses necessary knowledge and experience required for programme elaboration, and also the appropriate competences in the field of study of the programme. He/she is personally involved in programme implementation.
➢ Programme students are provided with an adequate number of administrative and support staff of appropriate

competence.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

Educational programs are carried out by suitably qualified academic and invited academic personnel. They have scientific, and practical experience, which is confirmed by their CVs, scientific articles published in the last 10 years, participation in scientific-practical conferences. A total of 12 people is involved in the implementation of the program. Out of these, 4 are academic staff, 8 are visiting lecturers. The academic staff has a doctor's academic degree, at least 3 or 6 years of scientific experience and scientific publications. Invited staff are selected in accordance with the University Staff Regulations. When assessing the suitability of the invited personal qualification, is taken into account a person's academic degree, received special education, publications and/or professional experience.

The academic and invited personnel implementing the program, according to their qualifications, fully ensure the achievement of the results of the educational program and the sustainability of the program. The practical and academic experience of both academic and visiting personnel is confirmed by their personal records. When assessing the suitability of the candidate's qualification, one shall take into account a person's academic degree, education received, publications and/or professional experience.

The balance between academic and invited staff ensures the sustainability of the program, with 1 Academic Staff for every 5 invited lecturers.

However, most of academic personnel is associated with other universities which poses thread to the sustainability of the program. Number of affiliated academic personnel should be increased.

Number of the staff involved in the programme (including academic, scientific, and invited staff)	**Number of Programme Staff**	**Including the staff with sectoral expertise[6]**	**Including the staff holding PhD degree in the sectoral direction[7]**	**Among them, the affiliated staff**
Total number of academic staff	12	11	11	4
- Professor	2	1	1	2
- Associate Professor	2	2	2	2
- Assistant-Professor				
- Assistant				
Visiting Staff	8	8	8	_
Scientific Staff				_

[6] Staff implementing the relevant components of the main field of study

[7] Staff with relevant doctoral degrees implementing the components of the main field of study

Evidences/Indicators

- Personnel CVs
- Personnel regulations
- Educational program
- Self-evaluation report
- Interviews

Recommendations:

- Most of academic personnel are not affiliated with the HEI but are associated with other Georgian universities. This poses a threat to the sustainability of the program. Number of affiliated academic personnel should be increased.

Suggestions for Programme Development

- None

Evaluation

Please, evaluate the compliance of the programme with the component

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
4.1 Human Resources	☐	☒	☐	☐

4.2 Qualification of Supervisors of Master's and Doctoral Students

The Master's and Doctoral students have qualified supervisor/supervisors and, if necessary, co-supervisor/co-supervisors who have relevant scientific-research experience in the field of research.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

HEI regulates the central rule of supervision of graduate students in the regulation of graduate studies and ensures that the graduate students have qualified heads with relevant skills and scientific-research experience. Within the mentioned program, a curator is defined for each student during the study period, who will help the master's students to engage in scientific research, similarly this resource will be used for the management of the master's degree. Each graduate student will have the opportunity to conduct graduate research at CERN.

Program is new and there are no active supervisors. However, qualification of affiliated and invited personnel is high enough to serve as MS supervisors or co-supervisors. During the interview, academic staff expressed their

readiness to supervise MS students. It was supposed that in the beginning stage of the program one of the affiliated personnel will be supervising and one of the invited personnel will be co-supervising.

Number of supervisors of Master's/Doctoral theses	Thesis supervisors	Including the supervisors holding PhD degree in the sectoral direction	Among them, the affiliated staff
Number of supervisors of Master's/Doctoral thesis	3	3	3
- Professor	1	1	1
- Associate Professor	2	2	2
- Assistant-Professor			
Visiting personnel			
Scientific Staff			

Evidences/Indicators

- Regulations for graduate studies
- Interviews
- Self-evaluation report

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
4.2 Qualification of Supervisors of Master's and Doctoral Students	☒	☐	☐	☐

4.3 Professional Development of Academic, Scientific and Invited Staff

➢ The HEI conducts the evaluation of programme staff and analyses evaluation results on a regular basis.
➢ The HEI fosters professional development of the academic, scientific and invited staff. Moreover, it fosters their scientific and research work.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The evaluation of the staff at the university is carried out by the administration and students. In order to generalize the best practices, staff evaluations are carried out on a systematic basis planned by the administration, which is carried out by the school director in cooperation with the academic office and/or the quality assurance service of the university. The results, as well as the recommendations, can be discussed at the Academic Board meeting. At the end of the semester students fill out a staff assessment questionnaire electronically. The school principal shall discuss the general results without mentioning the staff at the school board meeting.

Professional development of Academic staff is obliged to: a) take care of upgrading their qualifications, getting acquainted with the news and international experiences in their field; b) conduct research and publish research results; c) to participate in scientific conferences, both inside and outside the country.

The staff evaluation commission consists of permanent and special members. The permanent members are the rector of the university, the director of the school, the head of the relevant department/director of the institute, the head of the program, the representatives of the Quality Assurance Service and the Human Resources Service.

The staff involved in the program is also evaluated through a survey of students. The method involves the evaluation of professors / lecturers of the spring and autumn semesters by university students according to different criteria. These results are discussed at the commission.

The University of Georgia takes care of the professional development of the academic, scientific, and invited personnel and facilitates their research activities. For this purpose, the University has established a Scientific-Research Institute, which includes the Academic Personnel Development and the Project Management Service.

“Scientific Wednesdays” is a new project of the University of Georgia, the goal of which is to promote the development of research skills for academic staff and doctoral students.

In the case of submitting an application to a scientific institute within the university, if the academic staff affiliated with the university confirms that they plan to participate in any important scientific conference on behalf of the university, the scientific institute will fully reimburse these costs.

In order to develop and encourage the academic personnel, the University has developed bonus awarding instruction, which sets a prerequisite for such remuneration to publish a scientific article in a peer-reviewed journal. Also, the university reimburses the costs of attending important scientific conferences.

The University of Georgia is involved in the development of teaching methods in the Erasmus + project sustainable learner-centered Teaching - Advanced Recourse for Georgia and China (STAR), the aim of which is to introduce innovative teaching achievements to professors-teachers related to student-centered training.

The University of Georgia is involved in the following project: Contemporary competencies in academic teaching (MOCAT), which aims to develop cooperation between universities and modern methods of academic staff in the field of teaching methodology; Contemporary competencies in academic teaching (MOCAT), which aims to develop cooperation between universities and modern methods of academic staff in the field of teaching methodology; Within the framework of the project, an electronic platform was created, where more than 10 training courses are uploaded in teaching methods.

Evidences/Indicators

- Memoranda of understanding
- Bonus determination methodology
- Rules of activity of the Scientific-Research Institute
- Educational Program

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
4.3 Professional development of academic, scientific and invited staff	☒	☐	☐	☐

4.4. Material Resources

Programme is provided by necessary infrastructure, information resources relevant to the field of study and technical equipment required for achieving programme learning outcomes.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The University has some technical and material resources for the implementation of the program, including comfortable study auditoriums equipped with the latest equipment and technologies (projectors, computers, wireless Internet).

The program will cooperate with the Institute of High Energy Physics of Tbilisi State University. In the mentioned institute, students can the detector laboratory, where they will perform laboratory works. Within the framework of the mentioned cooperation, it is planned to expand and improve the existing laboratory depending on the objectives of the program.

The auditorium is designed to work with both small and large groups.

The latest textbooks and books are available in the University Library, and the necessary literature for the students is provided based on full meet of demand. In addition, they can use the electronic resources available in the university.

Evidences/Indicators

- Site visit
- Memoranda of cooperation with practice facilities
- Building plan, rules for using material resources

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
4.4 Material Resources	☒	☐	☐	☐

4.5 Programme/Faculty/School Budget and Programme Financial Sustainability

The allocation of financial resources stipulated in the programme/faculty/school budget is economically feasible and corresponds to the programme needs.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

The program has an approximate budget. The school, as an independent structural unit of the university, has a school budget that is distributed according to departments. Each department serves one or more study programs. The financial stability of the program is provided by program revenues, general school revenues and, if necessary, university revenues. Large infrastructural projects are mainly financed within the framework of grant projects obtained by the school or in the form of a project submitted from the central budget of the university.

Program Budget does not include rent (5000 GEL per semester) for High Energy Physics Institute Laboratory which is absolutely necessary for the program.

Evidences/Indicators

- Program budget
- Interviews with the administration

Recommendations:

- Program Budget should include the rent for the High Energy Physics Institute Laboratory (Georgia). (Note that after the site visit, the panel received an updated budget that already contains this item.)

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
4.5. Programme/ Faculty/School Budget and Programme Financial Sustainability	☐	☒	☐	☐

Compliance with the programme standard

4. Providing Teaching Resources	Complies with requirements	☐
	Substantially complies with requirements	☒
	Partly complies with requirements	☐
	Does not comply with requirements	☐

5. Teaching Quality Enhancement Opportunities

In order to enhance teaching quality, programme utilises internal and external quality assurance services and also, periodically conducts programme monitoring and programme review. Relevant data is collected, analysed and utilized for informed decision making and programme development.

5.1 Internal Quality Evaluation

Programme staff collaborates with internal quality assurance department(s)/staff available at the HEI when planning the process of programme quality assurance, developing assessment instruments, and implementing assessment process. Programme staff utilizes

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

Based on the University's Self Evaluation Report and Regulations, quality assurance service realizes the quality achievement at the university and faculty levels on learning and teaching, researching and institutional effectiveness. The University of Georgia has established a continuous improvement mechanism for evaluation and development of the educational program. Assessment is carried out using direct and indirect assessment methods.

In relation to the programs, there is a Provision of educational programs, which describes the procedures for approving programs, making changes and canceling them. The Document determines the Independent Educational Program Development Council for each programme and the Program Accreditation Board. The Program Development Council reviews and approves an IEP development strategy and a marketing plan

submitted by an administrative dean of IEP. The Program Accreditation Board furthermore approves project of changes (mission, goals, learning outcomes, curriculum, and preconditions of component/syllabus) to IEP and submits it to the academic council, as submitted by an academic dean of IEP, assigns the respect qualification to the graduates of the educational program and etc.

Planning of new educational programs and evaluation/development of current educational programs at faculty are carried out according to pre-established rules and procedures, using pre-established and approved criteria and indicators as well. Procedures of making changes in educational programs are carried out according to the established rules for approving the program.

During the interview, it was confirmed that the university's self-evaluation group and internal quality assurance department(s)/staff were actively involved in the planning and developing of the program.

It was confirmed during the interview that academic and invited staff implementing educational programs, administration of faculty and quality assurance service of the university participate in the evaluation planning and developing of the program. Self-evaluation team members confirmed that generally in the University student feedback is used in program development.

Through the study of the presented documentation and interviews, it is determined that the institution has an internal quality assurance system, which is based on documented processes and procedures, as well as appropriate tools. During the interview process, it was confirmed that the institution implements the process set up according to the regulatory documentation, conducts various surveys, has a connection with employers, uses various internal quality assurance tools. The purpose of the above-mentioned process is to make the programs' quality assurance mechanisms and procedures subject to the following principle: "Plan - Do - Check - Act".

Evidences/Indicators

- The Appendices of the Provision of an Educational Program
- Provision of an Educational Program
- Interview

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
5.1 Internal quality evaluation	☒	☐	☐	☐

5.2 External Quality Evaluation

Programme utilises the results of external quality assurance on a regular basis.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

In the external part of evaluation the institution considers feedback from National Center for Educational Quality Enhancement by authorization and accreditation, Feedback from Employers, Alumni ect.

- According to the Regulations in the University, Indirect assessment is carried out by the following methods:
- Graduate employment rate
- A study of graduate student evaluations using qualitative and quantitative techniques
- Employer research using qualitative and quantitative techniques to ensure the competitiveness of program graduates. Within the mentioned framework, the skills and abilities needed by the labor market are researched and determined. This research is carried out once in 3 years
- In order to improve and update the program, similar programs are reviewed once every 3 years and opportunities are discussed and measures are taken based on the competitive university program.

During the interviews, it was confirmed that the quality assurance office tries to reflect the results of the external evaluation in the daily processes.

In the external part of evaluation, the institution considers the feedback received from employers. During the interviews, the employers mentioned that they were involved in the program development process, where they had the opportunity to share their experiences.

In relation to the programs, there is also an external evaluation report from 2 field experts. One of them describes very clearly weaknesses and strengths of the program and gives recommendations to improve and develop the sillabi. During the interviews, it was confirmed that academic staff had considered most of the recommendations. According to Suggestions, they made some changes in each Courses.

Generally, it was confirmed that the University is using the results of external evaluation for development of Programme.

Evidences/Indicators

- External Evaluation Reports
- Interviews
- Programme and Sillabi
- Program Statement and Appendices

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
5.2. External Quality Evaluation	☒	☐	☐	☐

5.3 Programme Monitoring and Periodic Review

Programme monitoring and periodic evaluation is conducted with the involvement of academic, scientific, invited, administrative, supporting staff, students, graduates, employers and other stakeholders through systematic data collection, study and analysis. Evaluation results are applied for the programme improvement.

Summary and Analysis of the Education Programme's Compliance with the Requirements of the Component of the Standard

According to the regulations and documents of the university, monitoring and evaluation of the implementation of educational programs ensures periodic direct and indirect evaluation of the program and the involvement of stakeholders (academic, invited, administrative personnel, employers, graduates, students).

It has been confirmed that the students and professors participate in the various surveys. In the external part of evaluation, the institution considers the feedback received from employers. During the interviews, the employers mentioned that they were involved in the program development process, where they had the opportunity to share their experiences. Monitoring and periodic evaluation of the implementation of educational programs are the following varied indicators and for the programs will be conducted by the quality assurance service of the faculty. Also it was confirmed that the results of the program evaluation based on the comparison and several indicators will be presented to the program development Board. Based on Regulations at the University of Georgia, The results of the evaluation of the program shall be submitted to the Board at the established intervals, on the basis of which the necessary measures for the improvement of the program shall be defined.

It was confirmed that generally the university has appropriate mechanisms for evaluating learning outcomes. It was confirmed that the quality assurance service of the university has developed a mechanism for assessment of educational programs, in which not only the persons implementing the program participate, but also students, employers, experts in the field both from the educational space.

Apart from the many and detailed procedures, it seemed that some information was missing from the Self-evaluation Report. For example in the External Evaluation part. It must be highlighted that the information that was missing was only for the benefit of the institution, (If they had written it would be better for them) so the university must prefer to describe everything in detail in the self evaluation report.

Evidences/Indicators

- The Provision of an Educational Program
- Appendices of the Provision of an Educational Program
- Interviews

Recommendations:

- None

Suggestions for the programme development

- None

Evaluation

Please, evaluate the compliance of the programme with the component

Component	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
5.3. Programme monitoring and periodic review	☒	☐	☐	☐

Compliance with the programme standards

5. Teaching Quality Enhancement Opportunities	Complies with requirements	☒
	Substantially complies with requirements	☐
	Partially complies with requirements	☐
	Does not comply with requirements	☐

Attached documentation (if applicable): -

Name of the Higher Education Institution: University of Georgia

Name of Higher Education Programme, Level: Master of Physics, Master's Programme

Compliance with the Programme Standards

Evaluation / Standards	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
1. Education Programme Objectives, Learning Outcomes and their Compliance with the Programme	☒	☐	☐	☐
2. Teaching Methodology and Organisation, Adequacy Evaluation of Programme Mastering	☐	☒	☐	☐
3. Student Achievements, Individual Work with them	☒	☐	☐	☐
4. Providing Teaching Resources	☐	☒	☐	☐
5. Teaching Quality Enhancement Opportunities	☒	☐	☐	☐

Signatures:

Chair of Accreditation Expert Panel

Máté Csanád 

Accreditation Expert Panel Members

Avtandil Tavkhelidze 

Tamta Kobakhidze 

Davit Putkaradze