



NATIONAL CENTER FOR
EDUCATIONAL QUALITY
ENHANCEMENT

Accreditation Expert Group Report on Cluster of Higher Education Programmes

Master's educational program in chemistry
Doctoral educational program in chemistry
LEPL-Georgian Technical University

Evaluation Date(s)

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Information on the Higher educational Institution

Name of Institution Indicating its Organizational Legal Form	LEPL-Georgian Technical University
Identification Code of Institution	211 349 192
Type of the Institution	University

Expert Panel Members

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I. Information on the Cluster of Educational Programmes

	Programme 1	Programme 2
Name of the educational programme	Chemistry	Chemistry
Level of higher education	Master's Studie	Doctoral Studies
Qualification to be awarded	Master of Chemistry	Doctor of Chemistry
Name and code of the detailed field	Chemistry 0531	Chemistry 0531
Indication of the right to provide teaching of subject/subjects/group of subjects of the relevant level of general education ¹		
Language of instruction	Georgian	Georgian
Number of ECTS credits	120	180
Programme Status (Accredited/Non-accredited/Conditionally Accredited/New/International Accreditation) Indicating Relevant Decision (number, date)	Accredited	Accredited

¹ 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 the Cluster of Education Programmes²

The accreditation concerns the cluster composed by a Master and PhD programs in Chemistry, at the Georgian Technical University (GTU). Both programs received a conditional accreditation for 2 years. The cluster is designed in accordance with the current regulation of GTU and the Ministry of Education and Science of Georgia. Its goals are to prepare specialists

- with high level of knowledge of main fields of Chemistry for further professional and research activities;
- having skills for communication, showing own knowledge and work, diverse general education and ability to perform tasks undertaken efficiently and sense of responsibility

The Master program is structured in 2 academic years, for a total of 120 ECTS. The program is structured in two main components, an educational part and another focused on scientific research. The educational is then composed by a compulsory part, including courses in Organic, Analytical and Physical Chemistry and it corresponds to 55 ECTS. Three different specialities (concentrations) are then proposed, namely Organic, Physical and Inorganic Chemistry, for a total of 35 ECTS for each speciality. Finally a research project, to be conducted in the semester IV, complete the program, with a total of 30 ECTS.

The PhD program is structured in 3 academic years for a total of 180 ECTS. The program is structured in two main components, an educational part and another focused on scientific research. The educational component consists of mandatory and elective training courses and in total it amounts to 50 credits. The compulsory courses cover, in analogy with the Master program, Organic, Inorganic, Analytical and Physical Chemistry, while students can complete their formation choosing a more specialized course in one of these fields. Their learning is then completed by professor's assistantship during the second semesters (5 ECTS) and by a large research component (130 ECTS) covering the second and third year of the formation.

All the courses are given in Georgian, but the knowledge of English is a prerequisite.

Typically, 24 students are enrolled in the Master program and 12 in the PhD program. The academic staff is composed by 26 persons, including 10 professors, 13 associated professors. The ration between master/PhD thesis supervisors and number of student is very good (15/24 and 14/12, respectively).

• Overview of the Accreditation Site Visit

The visit was held on April 18 from 10:00 am to about 18:30. It started in the morning with the meeting with the representative of University Administration, the Deputy Rector, the Head of Quality Assurance Service of GTU, the Head of the teaching department of GTU, the Head of the Financial Department of GTU and the Dean of the Faculty. The discussion was focused on the general context of the program and on the engagement of the GTU and Faculty in supporting it. Then the members of the Self-Evaluation Team were interviewed on the weak and strong points of the program, as well as on specific aspects of the SER.

Next, details about the programs of the cluster were discussed with the program directors. The morning ended with the representatives of the Academic and Invited staffs, which were questioned about their implication in the program preparation, their courses and the other organizational aspects of the program.

In the early afternoon, the meetings with students and graduates of the program took place. The discussion was centered on their feedback about the followed program, the reason of their choice, and their actual status. Then the panel visited the facilities available to the cluster, including the GTU central library, laboratories and some

² When providing general information related to the programme, it is appropriate to also present the quantitative data analysis of the educational programme.

classrooms. During the following meeting with the quality assurance unit representatives, Makhviladze and Maisuradze the procedures for verify the quality of GTU programs and the feedback mechanisms were illustrated, while with the employers, remotely connected, some aspects concerning their expectations from the program and graduated students were discussed

The day ended with a first feedback of the visit to the program directors, University representatives and academic staff.

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

The cluster, that is both Master and PhD programs, substantially respects the educational standards expected for a cluster in Chemistry, including those related to the organization, quality assesment, course contenent, learning outcomes and their evaluation. Some problems have been however observed and reported in the below recommendations. Among others, it is worth to stress the poor status of the laboratory facilities that are far to correspond to the expected standards, both in terms of teaching and safety.

- **Recommendations**

The general recommendations of the experts for the cluster are:

- To develop laboratory activities so to improve practical skills of the students.
- The feedback mechanism between the cluster and the quality service of the University is based on a general procedure that it is not specifically adapted to the cluster content.
- The hours devoted to laboratory should be significantly increased
- Revise the structure of the program in order to ensure the development of practical and research skills to enable the achievement of the appropriate level of skills competence;
- To update cooperation memoranda with employers and practice implementation organizations, indicate cluster programmes, number of students, training courses to be implemented at the practice facility, deadlines.
- To plan and implement trainings for academic staff regarding modern teaching methods and their use in training courses.
- To carry out a complex analysis of the methods and criteria for evaluating the educational and research components of the cluster programmes and, based on the results of the analysis, to add improvement mechanisms.
- Consultation hours should be reflected in the workloads of the academic/visiting staff.
- for further development is very important that the Faculty quality assurance office manages processes stronger and help academic Staff to develop the Programms, however more collaboration between Participants.
- for the further development of the program, it is important to use a external evaluation system complexly, including taking into account the recommendations received in the accreditation-authorization processes, as well as peer evaluation.

The recommendations of the expert for the Master program are:

- The goals of the program should become more realistic and achievable and should be consistent with the content of the program.

- Improve laboratory facilities for the students and take into account in the definition of the learning outcomes the real possibilities offered by the infrastructure
- The learning outcomes should be formed in accordance with the content of the program.
- increase the number of laboratory hours
- Overlaps of issues in some courses should be corrected
- To correct the inconsistency between the "Professor's Assistantship" syllabus and the assessment forms provided for in Appendix 1 of the same syllabus. In addition, awarding credits for attending the lectures-seminars stipulated in Appendix 1 cannot be a method of evaluating learning outcomes.
- To improve the material and technical resources of the laboratories located in the II building of GTU; The institution should develop a strategic plan for the improvement of the material and technical resources, with reference to the provision of appropriate financial resources.

The recommendations of the expert for the PhD program are:

- The goals of the program should be defined in accordance with the qualification level, taking into account the basic competencies that will be provided by the content of the program.
 - The courses does not support the formation of student in biological engineering. This learning outcomes is disconnected from the program content and should be removed.
 - ~~increase the number of laboratory hours~~
 - Program staff must resolve discrepancies between the number of credits provided by the program structure and the assistant professor's syllabus.
 - In order to achieve learning outcomes and taking into account the specifics of the program, it is important to determine the list of programmes whose graduates will have the opportunity to continue their studies on a doctoral program.
 - to improve the material and technical resources of the laboratories located in the II building of the GTU, which is the most important fact of the program;
 - Involvement of both the head of the doctoral program and the doctoral candidate in international events is desirable
 - It is desirable to pay more attention to the training of the staff regarding the modern approach to teaching. Material resources to facilitate the implementation of scientific/research/performance-creative activities by staff should also be improved.
 - To improve the material and technical resources of the laboratories located in the II building of GTU; The institution should develop a strategic plan for the improvement of the material and technical resources, with reference to the provision of appropriate financial resources.
 - The learning outcomes should be formed according to the detailed field of the Classification of Fields of Study - Chemistry (0531) and program content.
- **Suggestions for the Programme Development**

The suggestions of the experts are:

- The objectives of the cluster should be verified all along the period of accreditations so to allow a adequation to the evolution of the employment market.
- To reduce the number of learning outcomes, so to have a better correspondence with the real opportunities offered to the students.

- A better organization of the courses between mandatory and optional component of the Master
- It is desirable to determine the list of fields whose graduates will have the opportunity to continue their studies at the "Chemistry" Master's program.
- It is desirable that the personnel implementing the programmes use the international connections that the GTU actually has;
- To plan and implement measures to include international student events and increase mobility.
- It is desirable that the process of checking papers on the plagiarism program should be carried out with the involvement of students and the supervisors of the paper.
- It is desirable to improve the supporting mechanisms of university for involvement of students in international events.
- It is desirable for the university to provide students trainings for the use of scientific bases and modern research methods.
- It is desirable to strengthen the PhD program in chemistry with personnel that meet international standards
- It is preferable for the following years of the faculty that the budget should reflect in detail the costs of financial provision of the activities planned (including lab renovations) for the development of Doctoral program.
- Partner research organizations are equipped with high-tech, international standards-compliant equipment, which GTU students have the opportunity to use, although it is desirable for the university to strengthen its own material and technical resources.
- It is preferrable to present the 2023 budget for the master's program, where the amount of funds intended for research planned in the program will be described in detail.
- It is preferrable to present the 2023 budget for the doctoral program, where the amount of funds intended for research planned in the program will be described in detail.
-

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

Not applicable

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

The argumentative position of the GTU was accepted for the following component :

Component 1.5 the recommendation on the PhD program « increase the number of laboratory hours » was cancelled

All the other argumentative positions of the GTU were not shared by the panel members

The following technical errors were also corrected :

Component 1.4, the recommendation was for the PhD program (as indicated in the Executive summary) and not for the Master Program

Component 4.5 the recommendation for the PhD program mentioned master program.

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

STU's Master's Program in Chemistry was granted conditional accreditation for a period of two years and it was given 24 recommendations. The self-assessment report does not provide information on the implementation about the recommendations, however, based on reviewing documents and the interview, the Experts analyzed the issue of the implementation of the recommendations and most of them have been implemented. Still some of them were not respected, notably those concerning the improvement of the material and technical base, with the indication of providing appropriate financial resources. As for the master, the PhD program was granted conditional accreditation for a period of 2 years, and 21 recommendations were determined and most of them were fulfilled. As for the Master some recommendations were not implemented. Among others, some inconsistencies in the syllabus and the requirements for being PhD's supervisor. These recommendations, together with the new ones, are reiterated by the panel

Evaluation approaches for the accreditation experts:

The components of the accreditation standards are evaluated using the following two approaches:

1. Cluster and individual evaluation
2. Cluster evaluation

Standard/Component	Assessment approaches:
1. Educational Programme Objectives, Learning Outcomes and their Compliance with the Programme	
1.1. Programme Objectives	Cluster and individual evaluation
1.2 Programme Learning Outcomes	Cluster and individual evaluation
1.3. Evaluation Mechanism of the Programme Learning Outcomes	Cluster evaluation
1.4 Structure and Content of Educational Programme	Cluster and individual evaluation
1.5 Academic Course/Subject	Cluster and individual evaluation
2. Methodology and Organisation of Teaching, Adequacy of Evaluation of Programme Mastering	
2.1. Programme Admission Preconditions	Cluster and individual evaluation
2.2. The Development of Practical, Scientific/Research/Creative/Performing and Transferable Skills	Cluster evaluation
2.3. Teaching and Learning Methods	Cluster evaluation
2.4. Student Evaluation	Cluster and individual evaluation
3. Student Achievements, Individual Work with them	
3.1. Student Consulting and Support Services	Cluster evaluation
3.2. Master's and Doctoral Student Supervision	Cluster evaluation
4. Providing Teaching Resources	
4.1. Human Resources	Cluster and individual evaluation
4.2. Qualification of Supervisors of Master's and Doctoral Students	Cluster evaluation
4.3. Professional Development of Academic, Scientific and Invited Staff	Cluster evaluation
4.4. Material Resources	Cluster evaluation
4.5. Programme/Faculty/School Budget and Programme Financial Sustainability	Cluster evaluation
5. Teaching Quality Enhancement Opportunities	

5.1. Internal Quality Evaluation	Cluster evaluation
5.2. External Quality Evaluation	Cluster evaluation
5.3. Programme Monitoring and Periodic Review	Cluster evaluation

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 institution. 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.

Educational programmes grouped in a cluster are logically interrelated to each other in line with the study fields and evolve according to the respective levels of higher education.

1.1 Programme Objectives

Programme objectives consider the specificity of the field of study, level and an 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.

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The objectives of the program cluster in Chemistry of the Technical University of Georgia are clearly defined and mainly take into account the peculiarities of the involved programs. They objectives of the programs, which differ according to the relevant level of education, reflect the main aspects of knowledge and skills that ensure the preparation of graduates with relevant competencies.

They are consistent with the mission, vision and values of GTU. In particular, "training competitive specialists with civic awareness, national and human values, offering new opportunities for research, education and technology, promoting the construction of a knowledge-based economy in the country and conducting innovative activities for integration into the international ecosystem." 2022-2028) with different directions and the goals and tasks of the Faculty of Chemical Technology and Metallurgy, which are defined by the faculty's regulations.

Defining the goals of the programs in the direction of internationalization also needs improvement, which also ensures compliance with the strategic direction of GTU 5 - internationalization, on the other hand, it will be important to use the opportunities of GTU in the direction of improving the internationalization of the program, in the direction of actually implementing the existing memorandums.

The active "Chemistry" master's and doctoral programs of GTU are posted on the website of GTU, therefore, the information is public and available to all interested persons.

Description and Analysis – **Master program in Chemistry**

The goals of the GTU Chemistry Master's Program are clearly defined and aligned with the key features defined by the study level and field of study classifier. The purpose of the program is to provide masters with deep and systematic knowledge in organic, physical, and inorganic chemistry and to develop professional skills for a successful career in

the modern labor market. The goals of the program are also to establish the competencies necessary for the adequate, effective and successful implementation of the types of professional activities in various fields of production. Graduates of the program will independently be able to critically analyze chemical research tasks based on the latest data, synthesize compounds with new properties, research their properties, and search for innovative methods and approaches for application. The master's program includes three concentrations (organic chemistry, physical chemistry, and inorganic chemistry) and if the student chooses one of these three concentrations, the student also completes the master's thesis in the chosen direction, the goal of the program - to provide deep and systematic knowledge in all areas of organic, physical and inorganic chemistry will be difficult to be achieved. Also, a student who chooses a physical chemistry concentration will find it difficult to achieve the goal of synthesizing compounds with new properties and researching their properties, given the content of the concentration. Therefore, it is important to make the goals of the program more realistic and achievable and to be consistent with the content of the program.

The Master's program in Chemistry corresponds to the mission of the university and the main directions of the strategic development plan. In particular, the main goals of the 3rd and 4th directions. Among them, are the development of the quality of educational programs and the promotion of scientific research and innovative activities.

In relation to labor market requirements, the objectives of the program take into account the basic requirements of local employers and are in line with international trends. Program staff and stakeholders share program goals

Evidences/Indicators

- Self-Evaluation Report, Master's degree educational program, interviews with the Self-Evaluation Team, with professors Geliashvili and Berdzenishvili heads of the program, and with the Employers.

Description and Analysis – PhD program in Chemistry

The objectives of GTU's Chemistry PhD program are clearly stated and outline the key aspects of knowledge and skills that the graduate of the program should achieve. The objectives of the program need to be improved taking into account the level of education. In particular, the training of a qualified chemistry researcher equipped with the skills to conduct the research and educational process, defined for the purpose of the program, will be difficult to achieve. Also, the goal: to study the physico-chemical and experimental methods of research and their successful application in practice, is not an appropriate goal of the 8th level, nor can it be achieved by the content of the program, considering that the structure of the program practically does not include laboratory studies. Also, the goal of the program: to participate in the full functioning of competitive production and research laboratories oriented to the local and international labor market. This goal can be achieved even at the 7th level of education. Therefore, it is important to define the objectives of the program in accordance with the qualification level, taking into account the basic competencies that will be provided by the content of the program.

The goals of the program take into account the main trends of the labor market, which were also confirmed by the employers during the interview process. It should be noted that in the self-assessment report 1.1. When describing the component, the justification of the relevance of the program in the labor market is given in the case of another program. Information about the program is public and shared by the persons implementing the program.

Evidences/Indicators

- Self-Evaluation Report
- Master's degree educational program,
- interviews with the Self-Evaluation Team
- Interviews with professor Tsintsadze heads of the PhD program.

Recommendations - None

Suggestions

- The objectives of the cluster should be verified all along the period of accreditations so to allow a adequation to the evolution of the employment market.

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and Suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s):

- The goals of the program should become more realistic and achievable and should be consistent with the content of the program.

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s):

- The goals of the program should be defined in accordance with the qualification level, taking into account the basic competencies that will be provided by the content of the program.

Suggestion(s): None

Evaluation

Component 1.1 - Programme Objectives	Complies with requirements	Substantially complies the requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.2 Programme Learning Outcomes

- The learning outcomes of the programme are logically related to the programme objectives and the specificity of the field of study.
 - Programme learning outcomes describe knowledge, skills, and/or sense of responsibility and autonomy which students gain upon completion of the programme.
-

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The learning outcomes of the cluster are coherent with the cluster objectives and organization and correspond to those expected for a cluster of programs in Chemistry. They well corresponds to the imposed standards in terms of knowledge and skills in Chemistry transmitted to the students and to the responsibility and autonomy expected for these levels of students (Master, PhD). It should be, however, noticed the lacks of adequate laboratory infrastructure that could significantly affect the concerned learning outcomes and, more in general, the acquired skills.

Description and Analysis – Master degree in Chemistry

The learning outcomes of the Master in Chemistry are clearly stated in the program. They can be grouped in two classes. The first one is composed by general learning outcomes and they are :

1. The student should have a deep and systematic knowledge in such branches of chemistry as organic chemistry, physical chemistry and inorganic chemistry, possesses modern physical and chemical research methodology and has the skills of their practical application;
2. Presents her/his argumentative conclusions and research methods about the task performed when communicating with the academic or professional community in Georgian and English, both with specialists and a general public;
3. Understands the peculiarities of the learning process and a high level of strategic planning, the ability to transfer knowledge based on acquired theoretical and practical experience and to constantly update independently;
4. She/he evaluates his own and others' attitude in introducing new values and cares for the establishment of modern standards of deepening professional ethics.

Most of these learning outcomes can be reached thanks to the structure of the program, its contents and, of course, the quality of the academic staff. They clearly reflect the effort of the heads of the program and of the associated academic staff in the formation of modern and independent graduates, able to quickly integrate the employment market or to continue and academic cursus. They are well connected to the courses present in the compulsory and optional parts and fulfill the standards in terms of responsibility, and autonomy that the is expected to have upon completion of the program. However, the lacks of adequate laboratory infrastructure confine some of these learning

outcomes to a theoretical level, that could significantly affect the future career of the program graduate, making them less performant, even at the national level.

The second group is composed by learning outcomes related to more specific objectives. In particular :

1. With the compatibility of program concentrations, by finding new original ways of solving complex problems in the field, describes the structure and physical-chemical properties of substances of various nature using the latest scientific methods and approaches;
2. Determines the physico-chemical properties of organic and inorganic compounds and uses the critical analysis of new information obtained to solve the problems faced by organic, inorganic and physical chemistry in scientific research;
3. Determines the tasks facing the chemical sciences, caused by modernity, the development of new synthesis methods of substances with desired properties, innovative methods of structural research and analysis, new possibilities of using substances;
4. Uses modern innovative methods based on the latest literary data in the synthesis and analysis of new chemical compounds, determining the structure, purity and properties of an unknown substance;
5. Formulates results obtained by literature analysis and/or experiment and conclusions about the purity and structure of the substance (including new) presented for analysis;

These outcomes are more oriented toward practical implications and they are directly related to the learning outcomes of specific courses, especially in Organic and Physical Chemistry. Some of them concern Analytical Chemistry, that is not characterized by a specific concentration, while Inorganic Chemistry is lacking. Globally, a general rationale for the identification of these learning outcomes seems lacking.

Finally, there are the learning outcomes related to the different concentrations :

Concentration 1 - Organic chemistry

1. Student will have a deep and systematic knowledge of the structure of various types of organic compounds, their reactivity, the possibilities of developing modern methods for the synthesis of new substances.
2. Using the methods of structural research and determination of the identity of organic substances in an unknown or interdisciplinary environment, while critically analyzing information obtained from various sources, based on knowledge of their properties and methods of synthesis, independently assesses the importance of their use on a laboratory and / or industrial scale in solving chemical problems.

Concentration 2 - physical chemistry

1. Student will have deep and systematic knowledge of the essentiality of the basic laws of physical chemistry, the structure of substances, the energy characteristics of chemical processes, their profitability, the consumption of reagents, the degree of formation of products, the development of processes over time, the kinetic regularities of catalytic processes, as well as the relationships in the chain "composition-structure-properties".
2. Independently evaluates and solves important research and applied problems in interdisciplinary areas on the basis of modern research methods and computer modeling technologies in the relevant professional field.

Concentration 3 - inorganic chemistry

1. Has a deep and systematic knowledge of the field of inorganic and analytical chemistry, the ability to use modern accurate analytical and specialized laboratory equipment to study chemical systems and objects.
2. Possesses modern physical and chemical research methodology, innovative methods of structural research and analysis, new possibilities of substances and skills of their practical use.

In general, they are in line with the type and the content of the course, even if some discrepancy can be observed. In particular, the learning outcomes in computer modeling is not fully supported by specific courses (e.g. molecular modeling, AI, etc.) and the specialized laboratory equipment available to students is limited and sometime not recent.

Description and Analysis – **PhD degree in Chemistry**

The learning outcomes of the PhD in Chemistry are clearly stated in the program. They can be grouped in two classes. The first one is composed by general learning outcomes and they are :

1. Generates new ideas of chemistry for solving research and practical tasks based on critical analysis and evaluation of modern scientific achievements, including in interdisciplinary research;
2. Determines independent planning, implementation and supervision of innovative research;
3. Develops new research and analytical methods and approaches focused on new knowledge;
4. Implements measures focused on the development of knowledge in the academic and professional context and critically evaluates the teaching/pedagogical and research activities;
5. Leads the development of innovative research approaches for the perfection of scientific activity, which is focused on the creation of new knowledge;
6. On the basis of critical analysis, synthesis and evaluation of new, complex and contradictory ideas and approaches, makes correct and effective solutions for problem solving
7. Develops new research and analytical methods and approaches of chemical and biological engineering, which are focused on the creation of new knowledge and are reflected in international refereed publications;
8. Demonstrates the ability to clearly present and transfer new knowledge in relation to existing knowledge, both to colleagues and the general public;
9. Adhering to the principles of academic integrity and taking into account innovative methods based on the latest achievements of the field in the field of interdisciplinary research, prepares research projects in the field of chemistry.

As for the Master program, the structure of the PhD program, the contents of the courses and the quality of the academic staff allow the reaching of most of these learning outcomes. They are well connected to the courses present in the mandatory part and well fits in the expected standard for the formation of modern and independent graduates, able to quickly integrate the national or international employment market. The exception is represented by the learning outcomes in biological engineering that do not correspond to the courses given in the PhD program in Chemistry. The link between this learning outcome and the PhD program does not clearly appear from the provided documents and indicators.

The list of the envisaged learning outcomes is completed by a last point, more specifically related to the optional courses envisaged in the second semester of the program, namely

10. Predicts the chemical nature of individual representatives of inorganic compounds, determination of their reactivity, energetics and kinetics of processes (reactions), mutual transformations between numerous classes of organic compounds, preliminary assessment of the properties of various materials, ways of obtaining biologically active substances independently and possibilities of use;

The subjects mentioned in this outcomes should be intended in an mutually exclusive way, since, as mentioned, the students can choice only one of the optional courses. It is then not clear why only some learning outcomes are mentioned and not others.

Evidences/Indicators

- Self-Evaluation Report
- Master's degree educational program

- PhD's degree educational program
- course syllabus
- interviews with the Self-Evaluation Team.

General recommendations of the cluster:

- To develop laboratory activities so to improve practical skills of the students.

General suggestions of the cluster:

- To reduce the number of learning outcomes, so to have a better correspondence with the real opportunities offered to the students.

Programme 1 Chemistry, Master

Recommendation(s):

- Improve laboratory facilities for the students and take into account in the definition of the learning outcomes the real possibilities offered by the infrastructure
- The learning outcomes should be formed in accordance with the content of the program.

Suggestion(s):

- better define the difference between Analytical and Inorganic Chemistry in the learning outcomes.

Programme 2 Chemistry, PhD

Recommendation(s):

- The courses does not support the formation of student in biological engineering. This learning outcomes is disconnected from the program content and should be removed. Improve laboratory facilities for the students.
- The learning outcomes should be formed according to the detailed field of the Classification of Fields of Study - Chemistry (0531) and program content.

Suggestion(s): None

Evaluation

Component 1.2 Programme Learning Outcomes	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.3 Evaluation Mechanism of the Programme Learning Outcomes

- Evaluation mechanisms of the programme learning outcomes are defined. The programme learning outcomes assessment process 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 Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The evaluation modes are reported in the syllabus of each course and are, therefore, easily accessible to each student. As it could be expected, the mode strongly depends on the topic of the course and on the teacher. Still, all the courses have some common features. In particular, the evaluation mechanism rests on three different practices, namely as evaluation during the semester (ongoing activity), mid-semester and final exams. The evaluation during the semester typically are a combination of different components, such as analysis of study case(s), questionnaire or homework. The analysis of one or more cases could be concern, for instance, the seminars presented during the semester, or the solving of practical examples related to the course topic or even as thematic project to be developed by the students. The outcomes could be a written report, the answers to the given questionnaire or an oral presentation (seminar). In some cases, each student gives up to 3 presentations on her/his work.

Questionnaires are based on closed- and open-ended questions. During the presentation a number of criteria could be evaluated, including the quality of the presentation, the mastering of basic and advanced scientific literature on the given topic, how the project has been executed or the scientific approach of the student(s).

Globally, these procedures allow for a very effective and fair evaluation of the learning outcomes.

For all courses a mid-semester and a final exams are envisaged and their dates are provided to the students at the beginning of the semester. The evaluation is generally done with a written questionnaire, with closed and open-ended questions.

These evaluations are then based on a scale of 100 points, corresponding to 5 positive grades (from A to E, covering the range from 100 to 51 points) and 2 negative grades (FX and F, range from 50 to 40 points). In case of a FX grade, an additional exam is prescribed, not before 5 days after the announcement of the results. The mark obtained in this second exam is not added to the mark obtained in the final assessment.

Globally, the evaluation mechanism in place allows to measure the learning outcomes, it is transparent and fair.

The feedback mechanism able to utilize the program learning outcomes to improve the program is assured by the quality assurance service of GTU. Few details are given on this point in the SER and few precisions were given during the interview.

Evidences/Indicators

- Self-Evaluation Report,
- Master's degree educational program,
- PhD's degree educational program,
- course syllabus,
- interviews with the students and graduates,
- interview with the quality service.

General recommendations of the cluster:

- The feedback mechanism between the cluster and the quality service of the University is based on a general procedure that it is not specifically adapted to the cluster content.

General suggestions of the cluster:

- A larger implication of the program staff in the feedback mechanism should be assured. English language could be used for all the oral presentation, so to further train the students.

Recommendations and Suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 1.3 Evaluation Mechanism of the Programme Learning Outcomes	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.4. Structure and Content of Educational Programme

➤ The programme is designed according to HEI's methodology for planning, designing and developing of educational programmes.

➤ The programme structure is consistent and logical. The content and structure ensure the achievement of the programme learning outcomes. The qualification to be awarded is corresponding to the programme content and learning outcomes.

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The structures of the two programs forming the cluster is clear, and adapted to reaching the formation objectives of a Master and PhD degree in Chemistry

Description and Analysis – Chemistry, Master program

The Master program is structured in 2 academic years, corresponding to 4 semesters, for a total of 120 ECTS (30 credits/semester). The program is structured in two main components, an educational part and another focused on scientific research. The educational part is then composed by a compulsory part, including courses in different fields of Chemistry, including Organic, Analytical and Physical Chemistry and it corresponds to 55 ECTS. Three different specialities (concentrations) are then proposed, namely Organic, Physical and Inorganic Chemistry, for a total of 35 ECTS for each speciality. Finally a research project, to be conducted in the semester IV, completes the program, with a total of 30 ECTS.

The courses in the compulsory part provide to the students fundamental knowledge in Chemistry and they include teaching subjects like Theoretical Inorganic Chemistry, Chemistry of Hydrocarbons and Mechanisms in Organic Chemistry. They are completed by courses on soft skills, such as Foreign Language, Pedagogy, Theory and Practice of Specialized Translation, Management of Entrepreneurial and Technological Innovations, representing about 1/3 of the total ECTS attributed to the compulsory part.

The three concentrations provide advanced courses in namely Organic, Physical and Inorganic Chemistry and runs on the II and III semesters. Finally the IV semester is devoted to the research activities devoted to the development and preparation of a Master's thesis.

The structure of the program is clear and adapted to the reaching the Master's objectives.

Description and Analysis – Chemistry, PhD program

The PhD program is structured in 3 academic years, corresponding to 6 semesters, for a total of 180 ECTS (30 credits/semester). The program is structured in two main components, an educational part and another focused on scientific research. The educational component consists of mandatory and optional training courses and in total it amounts to 50 credits, 45 for the training courses and 5 for the optional training courses.

It should be remarked that 15 ECTS are attributed to the teaching component of the professor's assistance, for 175 hours, which does not correspond to the number of credits and corresponding hours specified in the syllabus.

The compulsory courses cover, in analogy with the Master program, Organic, Inorganic, Analytical and Physical Chemistry, while students can complete their formation choosing a more specialized course in one of these fields. Their learning is then completed by professor's assistantship during the second semesters (5 ECTS) and by a large research component (130 ECTS) covering the second and third year of the formation.

The courses in the compulsory part provide to the students advanced knowledge in Chemistry and they include teaching subjects like Modern Concepts in Inorganic Chemistry, Theoretical Aspects of Physical Chemistry, Principle and Mechanisms in Organic Chemistry. They are completed by one course on soft skills (Scientific Communication Techniques).

The research component covers, as expected, a large part of the program and it is characterized by a number of milestones, mandatory during the two-year period. They are 3 meetings (colloquium) at the end of the III, IV and V semesters, followed by the final defense of the PhD thesis.

The PhD's program objectives, clearly stated in the documents, are related to the preparation of qualified and motivated chemists, with knowledge based on the latest achievements, and adapted to fulfill the requirement of local and international employment market.

The PhD program has a clear structure, coherent with the declared learning objectives.

Evidences/Indicators

- Self-Evaluation Report
- Master's degree educational program
- PhD's degree educational program
- course syllabus
- interviews with the academic staff.

General recommendations of the cluster: None

General suggestion of the cluster: None

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s):

- ~~Program staff must resolve discrepancies between the number of credits provided by the program structure and the assistant professor's syllabus.~~
- None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): ~~None~~

- Program staff must resolve discrepancies between the number of credits provided by the program structure and the assistant professor's syllabus.

Suggestion(s): None

Evaluation

Component 1.4 Structure and Content of Educational Programme	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The structure of the program substantially complies with the required standards, and only minor weak points have been identified, in term of organization of the course and of laboratory

Description and Analysis – **Master program in Chemistry**

The global structure of the Master program is in accordance with the Georgian legislation and the rules of the Academic Council of Georgian Technical University concerning the educational programs. The program is based on the ECTS system, 1 credit corresponding to 25 hours of workload, including also independent work. The distribution of credits according to the subjects is correct and clearly presented in the syllabus. The proposed courses cover all the main fields in Chemistry, including Organic, Inorganic, Analytical and Physical Chemistry, thus assuring, in principle, the general learning presented in the program. In the common part, subject like fundamental of Inorganic Chemistry, Physic and Chemistry of Macromolecules and Physical methods of experimental research are present and they well cover the needs of a modern learning program in Chemistry. Few courses are, however, very specialized and their content is not sufficiently justified with respect to the learning outcomes or general aims of the program. The courses « Chemistry of Hydrocarbons » and Physical of Colloid Chemistry for magistrates are more suitable for a concentration in Organic or Physical Chemistry rather than for the mandatory part. The choice of having a course on Thermodynamics on for the concentration in Physical Chemistry could be also an not optimal choice, in view of the general interest of this topics. Also concepts related to Chemical Bonding are dispersed in different courses instead of being concentrated in a single one.

There are also some overlaps in the syllabi of the master's program between, for instance, in the training courses “Physical–Chemical Analytical Methods of Compounds”, “Physical-chemical methods of experimental research” and “Instrumental Analysis for magistrates“.

The courses in the 3 proposed concentrations, Organic, Physical and Inorganic Chemistry are coherent with the level of specialization envisaged in this part of the program. The only question concerns the course of Foundation of Inorganic Crystal Chemistry, that could be more suitable for the concentration in Inorganic Chemistry. The proposed credits are pertinent with respect to the course contents and the learning outcomes. There is also a good balance in terms of hours/credits between the mandatory and the optional components.

Looking at the curriculum of the program, lectures, seminars (work in group) and practical classes are the main didactic approaches chosen. Laboratories are present for some courses, such as Physical-chemical

methods of experimental research (6 hours), modern approaches to polymer synthesis (30 hours), Quantitative analysis for Magistrates (30 hours). While pertinent with the course topic is evident, some questions could be raised about the learning outcomes concerned by the practical's in the laboratories, in view of their poor conditions, that could affect the teaching quality if not the safety and health of the students.

In contrast, the university library can provide access to a large number of scientific journals and books that students need for their work.

In general, there is also a good balance between the different didactic approaches, that is lecture, practical's and independent work

Description and Analysis – **PhD program in Chemistry**

As for the Master program, the structure of the PhD program follows the the Georgian legislation and the rules imposed by the Academic Council of Georgian Technical University concerning the educational programs. The program is based on the ECTS system, 1 credit corresponding to 25 hours of workload, including also independent work. The number of credits is correctly balanced between the different subjects and it is clearly presented in the syllabus. The proposed compulsory courses are a good complement to those presented in the Master program and well oriented toward the aim of the PhD program. A single optional course is also offered at the second semester (5 ECTS) to be chosen between 8 different options, covering topics not treated at other levels, such as Ecological Chemistry, Biologically active natural compounds and Agrochemistry. All these courses are based on lectures and workshop, while laboratory and practical's are missing.

Some drawbacks are present in the syllabus courses. In particular, the issues of the study course "Principles and Mechanisms of Organic Reactions" need to be specified, including the next issue "Last Year's Discoveries in Organic Chemistry and Synthesis", for which 5 out of 15 lecture topics are provided.

The study course "Chemistry in modern pharmacy" does not have a laboratory and it is unclear how it achieves the learning result "uses modern methods of isolation of biologically active substances from plant, animal and mineral raw materials"

The study course "Agrochemistry, quality of products and circulation of substances in the ecosystem", learning outcomes and issues do not correspond to the 8th level of education, in particular, "describes the history of the development of science from the XXVIII century to the present day, the circulation of chemical substances against the background of chemicalization and makes results on the colloidal system of the soil and plant origin on the productivity of raw materials".

The research part of the PhD program, running over 4 semesters, is organized around 4 compulsory milestones, namely 3 colloquium with the Dissertation Council at the end of first, second and third semesters and the PhD defense. Noteworthy, clear rules are given concerning the publication of the results obtained during the PhD cursus (at least three scientific articles, including one in an international peer-reviewed journal indexed in Scopus or in Web of Science and at least one without co-authors), aimed to valorize the scientific outcomes and the professional career of the student.

As for the Master program, the access to international scientific journals and books is assured by the University library in an affective way, while laboratory facilities do not fulfill criteria of modern research, thus biasing to some extent the reaching of the learning outcomes for the PhD students.

Evidences/Indicators

- Self-Evaluation Report

- Master's degree educational program
- PhD's degree educational program
- interviews with the academic staff
- facility visit.

General recommendations of the cluster:

- The hours devoted to laboratory should be significantly increased

General suggestions of the cluster: None

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s):

- increase the number of laboratory hours
- Overlaps of issues in some courses should be corrected

Suggestion(s):

- A better organization of the courses between mandatory and optional component of the Master

Programme 2 Chemistry, PhD

Recommendation(s):

- ~~increase the number of laboratory hours~~

Suggestion(s): None

Evaluation

Component 1.5 Academic Course/Subject	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compliance of the programmes with the standards

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
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Methodology and Organisation of Teaching, Adequacy 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 engagement 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.

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

Prerequisites and procedures for the admission of educational programmes included in the cluster are in accordance with the applicable legislation. Hence, in accordance with the Law of Georgia "On Higher Education", a person with at least a bachelor's degree or an equivalent academic degree has the right to study at a Master's degree; only the Master's degree candidate who has successfully passed the general Master's exam and the exam/examinations determined by the higher educational institution has the right to continue studying at the Master's educational program. Also, a person with at least a Master's degree or an academic degree equivalent to it has the right to study for a doctorate. Admission to the Master's program is also possible without the unified Master's exams, according to the law. The prerequisites for admission to the programmes also provide for the enrollment conditions for external and internal mobility. Both programmes united in the cluster also provide for the conditions of confirmation of the English language at the B2 level.

Prerequisites for admission to the programmes mainly ensure the admission to the programmes of persons with the necessary competencies to overcome the programmes and are logically related to the level of education.

The methodology of the GTU's student contingent planning takes into account the university's mission, strategic development plan, resources, labor market requirements and indicators selected by the university. Among them, the planning of the contingent of the educational program is done by the faculty, with the involvement of the manager, the head of the program and the academic departments; one of the important parameters for planning the contingent of students according to the programmes is the quantitative indicators of students over the last three years (students with active status, status suspended, status terminated, mobility indicators, etc.).

The methodology of planning students for Master's and doctoral programmes is also described by the regulations of the Georgian Technical University on Master's and doctoral studies. Also, the rules for planning, developing, evaluating and developing the educational program at the Georgian the GTechnical University determine the issues of evaluating the human and material resources necessary for the implementation of the program. A necessary condition for the implementation of the program is: the financial income of the program, depending on the projected contingent of students, must cover all current costs.

Prerequisites for admission to the programmes are fair and public. Information about the programmes is posted on the university's website. On the page of the Faculty of Chemical Technology and Metallurgy, where the mentioned programmes are implemented, the necessary information for interested persons is uploaded.

Description and Analysis - Programme 1 (Chemistry, Master)

The prerequisite for admission to the Master's program "Chemistry" is the admission to the program of persons with the necessary knowledge and skills to overcome the program. In particular, a person with at least a bachelor's degree or an equivalent academic degree, who is enrolled based on the results of the Master's exams (common Master's exam and exam/exams determined by the GTU), has the right to study in the Master's program. Prerequisites for admission to the program do not determine which program graduates may continue their studies in the Chemistry Master's Program. Accordingly, a university exam is provided, the questions of which are available at least one month before the exam. Taking into account the specifics of the program, it is desirable to determine the list of fields whose graduates will have the opportunity to continue their studies at the "Chemistry" Master's program.

The prerequisite for admission to the program is the confirmation of knowledge of the English language at the B2 level, which will contribute both to the possibility of achieving the learning outcomes of the program and the learning outcomes of the content-specific training courses.

The regulation of the GTU on the Master's degree provides for the conditions for determining the quota to be admitted to the Master's degree. In particular, the professor, associate professor, assistant professor, invited staff/pedagogue, emeritus of the relevant academic department, as well as the chief or senior scientist-collaborator of the scientific institutes integrated with the GTU, within the framework of the corresponding program of the Master's degree, submits a written submission to the academic department in order to determine the contingent admitted to the Master's degree. The proposal on the allocation of vacant places with proper justification, which is considered in the academic department and after approval, is submitted to the dean of the faculty, on the allocation of vacant places according to Master's programmes, as well as indicating the probable supervisors and topics of Master's theses. After discussion at the faculty council, the decision to consider the relevant vacancies in the admission contingent will be submitted to the academic council for approval.

Description and Analysis - Programme 1 (Chemistry, PhD)

A person with a Master's degree or equivalent academic degree has the right to study at the doctoral educational program "Chemistry". The following are taken into account: the existence of scientific publications, participation in scientific conferences, other documents related to educational/research activities. The applicant must also submit a research project outlining the applicant's research objective and direction. Confirmation of knowledge of English at B2 level is also mandatory. In case of receiving a positive assessment in the English language, the applicant goes through an interview with the faculty temporary committee. Accordingly, compliance with the conditions for admission to the doctoral program by commission is ensured. The prerequisites for admission to the program do not provide a list of the fields in which a person with a Master's degree or an equivalent degree has the right to continue studying in the program, as well as it is not defined which research publications are taken into account and the probable topics of the research project. In order to achieve the learning outcomes provided by the program, it is important to define the list of programmes whose graduates will have the opportunity to continue their studies in the doctoral program.

In accordance with the regulations of the GTU doctoral studies, the methodology for determining vacant places includes the following procedures: the estimated number of vacant places accepted for doctoral studies is determined by the relevant academic department of the faculty with the participation of the head/leaders of the doctoral education program; based on the decision made at the meeting of the academic department, the dean of the faculty submits to the faculty council a request for the number of acceptable vacant places and the creation of temporary faculty commissions. Based on the decision of the faculty council, the dean submits the minutes of the faculty council and the service card to the vice-rector with the request for the allocation of vacant seats and the approval of the composition of the temporary faculty commission/commissions.

Evidences/Indicators

- Educational programmes
- Instruction on the formation and mobility of the student contingent at the Georgian Technical University https://gtu.ge/Study-Dep/Files/Pdf/st_kion_mob_inst_91019_SD.pdf
- Regulation of the Georgian Technical University on the Master's degree (Decision of the Academic Council of August 14, 2020 №01-05-04/133);
- Legal Entity under Public Law - the regulations of the doctoral program of the Georgian Technical University;
- GTU website;
- Rules for planning, developing, evaluating and developing the educational program at the Georgian Technical University (STU Academic Council dated September 23, 2019);
- Annex to Resolution No. 01-05-04/261";
- Interview results.

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s):

- It is desirable to determine the list of fields whose graduates will have the opportunity to continue their studies at the "Chemistry" Master's program.

Programme 2 Chemistry, PhD

Recommendation(s):

- In order to achieve learning outcomes and taking into account the specifics of the program, it is important to determine the list of programmes whose graduates will have the opportunity to continue their studies on a doctoral program.

Suggestion(s): None

Evaluation

Component 2.1 Programme admission preconditions	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.

Cluster and individual evaluation**Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component**

Possibilities for the development of practical skills of the program, depending on the structure of the program and the material-technical base, need to be improved. The structure of the program includes both compulsory courses and concentrations. Among the mandatory courses, only one training course "Physico-chemical methods of experimental research" includes laboratory studies only in the direction of conducting refractometric and polarometric analysis. In this case, it will be difficult to achieve the following learning outcome "Knows methods of ultraviolet and infrared spectroscopy analysis to determine functional groups, substance identification and quantity." From the "Physical Chemistry" concentration provided by the program, only one study course "Fundamentals of the theory of solutions" includes laboratory studies.

The structure of the doctoral program, in relation to the educational components, provides for classes in lecture and seminar format, 175 hours of laboratory classes are determined only with the assistance of the professor. In the syllabus of the professor's assistance, a different distribution of hours is specified, namely 75 - practical, 173 - independent and 2 exam hours, and the activities to be carried out are also specified. The development of practical and research skills of the doctoral program is mainly provided by the research component. Therefore, it is important for both programmes to review the program structure to ensure the development of practical and research skills to enable the achievement of the appropriate level of skills competence.

The Georgian Technical University has signed memoranda of cooperation with potential employers in order to develop students' scientific-research and transfer skills. A group of experts analyzed the submitted memoranda and agreements (20 in total). It should be noted that the majority of the presented memoranda do not indicate cooperation within the framework of the "Chemistry" Master's and doctoral program, the number of students is not indicated. Some of the memoranda expire in 2023 and need to be renewed. Also, the syllabus of the Master's program "Physico-Chemical Methods of Substance Analysis" and "Instrumental Analysis for Master's Students" provides for practice, and the object of practice is indicated: the Central Chemical-Microbiological Testing Laboratory of "Georgian Water

and Power" and the Rafiel Agladze Laboratory of TSU Research Laboratory of Physico-Chemical Analysis of the Institute of Inorganic Chemistry and Electrochemistry. Attendance of the mentioned training courses is not provided by the memorandums. It is worth noting that the interviews with employers and practitioners have confirmed that they are willing to accept a certain number of students in their organizations and attach a relevant specialist to the practice site.

Regarding the development of students' practical and research skills, it is worth noting that they have the opportunity to participate in various university events, including student scientific conferences. However, there is no data on their participation in international events. It is desirable that the programmes use the international connections that the Georgian Technical University actually has. Therefore, it is important to plan and implement measures to include international student events and increase mobility.

Evidences/Indicators

- Master's Program "Chemistry";
- PhD Program "Chemistry";
- Syllabus of learning courses;
- Memoranda of cooperation with employers and organizations implementing practice;
- Interview results.

General recommendations of the cluster:

- Revise the structure of the program in order to ensure the development of practical and research skills to enable the achievement of the appropriate level of skills competence;
- To update cooperation memoranda with employers and practice implementation organizations, indicate cluster programmes, number of students, training courses to be implemented at the practice facility, deadlines.

General suggestions of the cluster:

- It is desirable that the personnel implementing the programmes use the international connections that the GTU actually has; To plan and implement measures to include international student events and increase mobility.

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 2.2. The Development of practical, scientific/research/creative/performing and transferable Skills	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.3. Teaching and Learning Methods

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

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The teaching-learning methods indicated in the syllabus of the educational programmes included in the cluster are varied and are in accordance with the level of education, the content of the courses and, if used properly, ensure the achievement of the learning outcomes of each course. To implement the educational components of the Master's program, the following are used: lecture, seminar, laboratory and practical work; practice; course work/project; Master's thesis; counseling; Independent work.

The following methods and forms are used to achieve the learning outcomes of the doctoral program: lecture, seminar (group work), scientific-thematic seminar, independent work, research component.

Various activities are used in the teaching-learning process. including: discussion/debate; group (collaborative) work; problem-based learning (PBL); heuristic; case study (Case study); to demonstrate deductive; analysis; synthesis; verbal or oral; written work; practical; explanatory; action-oriented learning; Project development and presentation, etc.

Through interviews with program staff, it became clear that more support and information is needed regarding the activities specified in the syllabi, including modern teaching methods specified in the syllabi (eg problem-based learning - PBL), which are actually less used.

Evidences/Indicators

- Educational programmes;
- Cluster self-assessment report;
- Syllabus of learning courses;
- Evaluating mechanisms for the learning outcomes of the program;
- Interview results.

General recommendations of the cluster:

- To plan and implement trainings for academic staff regarding modern teaching methods and their use in training courses.

General suggestions of the cluster:

- None

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 2.3. Teaching and learning methods	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.4. Student Evaluation

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

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The evaluation of students of educational programmes grouped in a cluster is carried out according to the instructions for managing the learning process of the GTU, which is in accordance with the statement #3 of the Minister of Education and Science of Georgia. The instruction includes the evaluation mechanisms of both the educational component and the scientific-research components. The instruction also provides for the issues of appealing the evaluation of study results and resuming an exam missed with an honorable reason. The GTU also has a procedure for evaluating the scientific-research component of the Master's educational program and the training and research components of doctoral educational programmes and their evaluation procedure. The evaluation system and procedures provided by the presented rules and regulations are described in the syllabuses of the training courses. Therefore, it is applied fairly to all students and is consistent with the law. Assessment components and criteria are known to students. Since the students of the Master's and doctoral program take exams and, accordingly, receive current evaluations from the staff implementing the training course, feedback is provided directly at the end of the exam process. Students also receive information about the achieved results with the help of an electronic system. They have information about appealing the results, but the students interviewed did not have the need to do so and did not use it in practice. They also have information about checking papers on plagiarism program, but this checking process is done by the faculty administration and students and thesis supervisors are not involved in this process, but they get information about the percentage that their paper showed.

The GTU has developed the instructions for completing the paper submitted for obtaining the academic degree of Master and the form of the personal work plan of the Master's student. Also developed are the instructions for the presentation of the thesis submitted for obtaining the academic degree of doctor and the drawing up of the autoabstract, the form of the personal work plan of the doctoral candidate.

The evaluation system of training courses (in accordance with the statement of the Minister #3), by which the student's knowledge is evaluated on a 100-point scale, provides for five types of positive and two types of negative evaluation. In case of acceptance of (FX), the student is given the opportunity to take the exam additionally. The Master's thesis is evaluated according to the commission method and the 100-point evaluation system, which also includes five types of positive and two types of negative evaluation. In case of receiving an (FX) grade, the Master's student is allowed to submit a revised paper during the next semester, and in case of an (F) grade, the Master's student loses the right to submit the same paper.

The evaluation of the scientific-research component of the doctoral educational program is done for one occasion, with the final evaluation. The defense of the dissertation is held in public, at the session of the Dissertation Council. The work is evaluated immediately after the defense, by each member of the council, by secret ballot, in accordance with predetermined criteria. Five positive and two negative evaluations are used for one-time evaluation of the thesis. Negative evaluations are:

- a) unsatisfactory (insufficenter) - a result that cannot meet the requirements due to significant deficiencies;
- b) Completely unsatisfactory (sub omni canone) - a result that does not fully meet the requirements.

Upon receiving an "unsatisfactory" grade on the defense of the thesis, the doctoral student has the right to submit a revised thesis within one year. Upon receiving a "completely unsatisfactory" grade or a repeated "unsatisfactory" grade on the defense of the thesis, the doctoral student loses the right to submit the same thesis.

The quality assurance service of the faculty regularly analyzes the results of student evaluations. In the case of the Master's program, the analysis was performed with respect to all three concentrations. A number of shortcomings

were identified and a recommendation was made regarding the appointment of additional consultations. The analysis of the results of the doctoral program was carried out according to the study courses, at this stage the results are close to the target marks, however, the analysis will be carried out according to the three-year cycle and measures for improvement will be identified. It is important to conduct a complex analysis of evaluation components and criteria and, based on the results of the analysis, to develop improvement mechanisms.

Description and Analysis - Programme 2 (Chemistry, PhD)

The doctoral educational program of the GTU "Chemistry" includes the educational component "Professor's Assistantship". The assessment forms, methods and criteria specified in the syllabus differ from the assessment forms in Appendix 1 of this syllabus. In particular, according to the syllabus, the evaluation of the doctoral student by attending lectures and seminars is not defined, while Appendix 1 provides for the accumulation of 0.8 credits for attending lectures and 1.2 credits for attending seminars. Accordingly, the evaluation and awarding of credits by the student's attendance at lectures and seminars is irrelevant.

Evidences/Indicators

- Instruction for managing the educational process of the GTU;
- The method of evaluation of the scientific-research component of the Master's educational program;
- Educational and research components of doctoral educational programmes and their assessment procedure;
- Educational programmes;
- Syllabuses of training courses;
- Analysis of students' academic performance;
- Interview results.

General recommendations of the cluster:

- To carry out a complex analysis of the methods and criteria for evaluating the educational and research components of the cluster programmes and, based on the results of the analysis, to add improvement mechanisms.

General suggestions of the cluster:

- It is desirable that the process of checking papers on the plagiarism program should be carried out with the involvement of students and the supervisors of the paper.

Recommendations and suggestions according to the programmes:

Programme 1 (Chemistry 3rd level)

Recommendation(s):

- To correct the inconsistency between the "Professor's Assistantship" syllabus and the assessment forms provided for in Appendix 1 of the same syllabus. In addition, awarding credits for attending the lectures-seminars stipulated in Appendix 1 cannot be a method of evaluating learning outcomes.

Suggestion(s): None**Evaluation**

Please, evaluate the compliance of the programmes with the component

Component 2.4 - Student evaluation	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compliance of the programmes with the standards

2. Methodology and Organisation of Teaching, Adequacy Evaluation of Programme Mastering	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 (name, level)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 (name, level)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 engagement in local and / or international projects; proper quality of scientific guidance and supervision is provided for master's and doctoral students.

3.1 Student Consulting and Support Services

Students receive consultation and support regarding planning of the 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.

Cluster and individual evaluation**Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component**

Students of Georgian Technical University University Faculty of Chemical Technology and Metallurgy receive appropriate information upon the planning of learning process and improvement of academic achievement, which is achieved via usage of web page and e-mails, giving opportunity for every student to track their achievements in studies, as well as communicate with representatives of the Administration and lecturers.

GTU has as a new electronic database <https://vici.gtu.ge/> which offers students a variety of functions: Personal information's, semester; GPI, number of accumulated and current credits, program curriculum and syllabi which was confirmed by students. Also HEI has the electronic learning system <https://elearning.gtu.ge> . If necessary, the university ensures the appointment of an individual teaching schedule for the student, as well as the preparation of individual study plans

The students interview revealed also that students are getting appropriate communication planning the educational process, improving academic achievement, employment and career development from HEI Staff, e.g., from the Dean's office, the Head of the educational programs, Department of Chemistry and QA Department.

The students have opportunities to participate in conferences and other kinds of extracurricular activities. During the interviews with the Chemistry PhD and MA programs students, mentioned that they would like to have a opportunity to participate in international exchange programs and in conferences/seminars/trainings.

At the time of interviewing students, they have mentioned that University has appeal procedures if there is something that do not agree with in the learning process.

During the interviews students noted that they would like to improve laboratories and modern technologies for practice and trainings.

Evidences/Indicators

- -SER
- - Educational program
- - University website
- - Interview results

General recommendations of the cluster: None

General suggestions of the cluster:

- It is desirable to improve the supporting mechanisms of university for involvement of students in international events.

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 3.1 Student consulting and support services	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2. Master's and Doctoral Student Supervision

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

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The regulations of the master's and doctoral studies of the Technical University of Georgia provide for relevant requirements for supervisors (co-supervisors) of master's and PhD students and procedures for their appointment/approval, change/addition of a scientific supervisor.

In accordance with the regulations of the master's degree, the supervisor of the master's degree May be a professor of the relevant academic department, associate Professor, Assistant Professor, Visiting Professor, Visiting Associate Professor, Visiting Assistant Professor.

The supervisor of the master's student determines the staff in agreement with the master's student The work plan, where the title of the master's thesis should be indicated, List of mandatory and optional subjects/modules. Head of Program has regular consultations with the master's student in accordance with the research topic.

According to the doctoral regulations, the doctoral student's scientific supervisor can be a professor of GTU, an associate professor (also invited), emeritus, as well as Chief or senior researcher of an independent scientific research unit (institute, center) of the university, who has scientific research experience in the direction of the PhD student's research field. Also appropriate qualification requirements have been developed for the co-supervisor of the doctoral thesis. The regulations of the doctoral program provide regular consultations for the doctoral students, which the students also confirmed but the consultation hours are not reflected in the workloads of the academic/visiting staff. The master's program is served by 27 academic and invited staff, 15 of them are involved in the process of preparing master's programs. There are 24 students of active status in the master's program.

Accordingly, the ratio between thesis supervisors and students is 15/24. Students complete their master's thesis in the fourth semester, and the ratio is taken from the number of students in both years. The Doctoral program is served by 21 academic and invited staff, 14 of them are involved in the process of preparing doctoral programs. There are 12 students of active status in the doctoral program. Accordingly, the ratio between thesis supervisors and students is 1/12. It should be noted that the indicators of articles published in journals indexed in international databases and participation in international events by supervisors of master's/doctoral theses require significant improvement. According to the submitted self-evaluation report, the number of published articles in international journals by involved personnel in the programs in the last 5 years is 22 and 21. This indicator of the publications is even less in the international scientific bases of Scopus and Web of Science. It is important that to add 2 or 3 published publications in the last 5 years in the international scientific bases of Scopus and Web of Science in the direction of the research topic to the requirements for supervisors of master's and doctoral theses. Scientific supervisor/co-supervisors, two weeks after approval the personal work plan of the doctoral candidate will be submitted to the dean's office. The supervisor has regular consultations with PhD students. The frequency of consultations corresponds to the specifics of the program and research topic. Head of programs have many years of experience in academic and scientific activities. Head of Program has regular consultations with the PhD students, what include periodical evaluation of the scientific progress of the doctoral candidate; giving general scientific advices, assistance in research design and management in the process of writing a scientific-research paper/dissertation; Also, giving advice on publishing scientific articles in refereed/high-ranking journals. Members of experts team studied master's and doctoral theses submitted by the institution in the last five years. The system of reviewing and evaluating master's and doctoral theses needs improvement, for example a doctoral thesis used only Georgian and Russian language sources. So, students need more support and appropriate consultations regarding how to use of international scientific bases and modern research methods.

Data related to the supervision of master's/doctoral students	
Programme 1 (name, level)	
Number of master's/doctoral theses supervisors	15
//Number of doctoral thesis supervisors	14
Number of master's students	24
//Number of doctoral students	12
Ratio - supervisors of master's theses/master's students	15/24
Ratio - supervisors of doctoral theses/doctoral students	14/12

Evidences/Indicators

- Master's and Doctoral programs
- Regulations of Georgian Technical University
- Study courses and syllabi
- Faculty website <https://gtu.ge/Ctmf/>
- Interview results
- supervisors' CV and research publications

General recommendations of the cluster:

- Consultation hours should be reflected in the workloads of the academic/visiting staff.

General suggestions of the cluster:

- It is desirable for the university to provide students trainings for the use of scientific bases and modern research methods.

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 3.2. Master's and Doctoral Student Supervision	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compliance of the programmes with the standards

3. Student Achievements, Individual Work with them	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Providing Teaching Resources

Human, material, information and financial resources of educational programme/educational programmes grouped in a cluster ensure the 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 with relevant competence.
-

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

The program is lead by people with appropriate qualifications who have the necessary competence to produce the learning outcomes provided for by the program. The number and workload of the academic and invited personnel implementing the program ensures the proper management of the educational process defined by the educational program. The academic staff is selected through an open competition, in compliance with the "The Law of Georgia on Higher Education" and the Georgian Technical University Charter. The academic staff's qualifications are in accordance with the standards established by the legislation and the internal regulations of the Higher Education Institution. During the interviews with the key stakeholders, it was clear that the leadership team are committed to the curriculum and goals of the joint programme. Academic staff selection criteria are described in the self-evaluation report, qualification requirements for academic/scientific/visiting/administrative/support staff positions, taking into account job descriptions, functions and applicable legislation; The qualification of the academic/scientific staff is confirmed by the scientific work done in the last 5 years; The full workload of academic/scientific and invited staff, including affiliated academic staff, including the workload on educational programs grouped in a cluster, ensures the smooth implementation of the educational program and the timely performance of the functions assigned to the staff implementing the educational program;

Description and Analysis - Programme 1 (Chemistry 2nd level)

The academic staff is selected through an open competition, in compliance with the "The Law of Georgia on Higher Education" and the Georgian Technical University Charter. The academic staff's qualifications are in accordance with the standards established by the legislation and the internal regulations of the Higher Education Institution. During the interviews with the key stakeholders, it was clear that the leadership team are committed to the curriculum and goals of the joint programme. Only one of the invited staff attended the interview, according to the interview, the invited staff is actively involved in the process of developing educational programs.

27 academic personnel are involved in the implementation of the program. 11 of them the academic staff are professors, 14 are associate professors and 2 are assistant professors.

The program has a renewable workload scheme for academic and visiting staff. The number of academic and visiting staff is adequate to the number of students and the ratio between academic and visiting staff ensures the sustainability of the program.

Programme 1 Chemistry, Master				
Number of the staff involved in the programme (including academic, scientific, and invited staff)	Number of Programme Staff	Including the staff with sectoral expertise³	Including the staff holding PhD degree in the sectoral direction⁴	Among them, the affiliated academic staff
Total number of academic staff	27			25
- Professor	11			10
- Associate Professor	14			13
- Assistant-Professor	2			2
- Assistant	0			0
Invited Staff	2			–
Scientific Staff	0			–

Description and Analysis - Programme 2 (Chemistry 3rd level)

21 academic personnel are involved in the implementation of the program. 17 of the academic staff are professors, 4 are associate professors. The program has a renewable workload scheme for academic and visiting staff. The number of academic and visiting staff is adequate to the number of students and the ratio between academic and visiting staff ensures the sustainability of the program. The number of staff corresponds to the number of PhD students. Also, the ratio between academic and visiting staff ensures the sustainability of the program. The number of doctoral students corresponds to the workload of their supervisors. However, international cooperation or strengthening of the program with personnel that meet international standards is desirable.

³ Staff implementing the relevant components of the main field of study

⁴ Staff with relevant doctoral degrees implementing the components of the main field of study

Programme 1 (chemistry, 3rd level)				
Number of staff involved in the programme (including academic, scientific, and invited staff)	Number of Programme Staff	Including the staff with sectoral expertise	Including the staff holding PhD degree in the sectoral direction	Among them, the affiliated academic staff
Total number of academic staff	21			15
- Professor	17			12
- Associate Professor	4			3
- Assistant-Professor	0			0
- Assistant	0			0
Invited Staff				-
Scientific Staff				-

Evidences/Indicators:

- CVs
- Personal files of academic and invited staff
- Self-evaluation form
- Interview

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Suggestion(s):

- It is desirable to strengthen the PhD program in chemistry with personnel that meet international standards .

Evaluation

Component 4.1 Human resources	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.2 Qualification of Supervisors of Master's and Doctoral Students

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.

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

Georgian Technical University has developed transparent qualification requirements for the scientific supervisor/co-supervisor, which corresponds to the requirements of the master's/doctoral level and reflects the specifics of the program and the best international practices; Based on self-evaluation forms and interview "Development of quality-oriented educational and scientific-research activities" and "promotion of internationalization" are defined as priority directions of the strategic development plan of the Technical University of Georgia, which have been successfully implemented to a large extent based on academic staff development. Accordingly, to increase the qualification of the staff (academic/scientific/visiting/ administrative/assistant) employed in the university, and to facilitate the efficient realization of the research/scientific process, the "Human Resource Management Policy and Strategy of Georgian Technical University" focused on personnel development has been developed. The faculty commission for the evaluation of educational programs permanently conducts the inspection of the classes conducted by the academic staff of the faculty, evaluates the real situation and makes appropriate conclusions. In the Department of Chemistry, it is important to raise the quality of teaching, effectively transfer teaching materials to students. In general, the rate of development of Chemistry Department staff is satisfactory, it is characterized by the increasing dynamics of activity, but there is a need for more involvement in scientific conferences and, especially, joint scientific-research work. in publishing activities and international trainings.

Description and Analysis - Programme 1 (Chemistry 2nd level)

Georgian Technical university has developed transparent qualification requirements for scientific supervisor/co-supervisor, which corresponds to the requirements of the master's level and reflects the specifics of the program. Depending on the specificity and development of the field, the scientific co-supervisor of each master's student is equipped with the latest knowledge.

Programme 1 (chemistry, 2nd level)			
Number of supervisors of Master's/Doctoral theses	These supervisors	Including the supervisors holding PhD degree in the sectoral direction	Among them, the affiliated academic staff
Number of supervisors of Master's/Doctoral theses	15		
- Professor			
- Associate Professor			
- Assistant-Professor			
Invited Staff	2		–
Scientific Staff			–

Description and Analysis - Programme 2 (Chemistry 3rd level)

Georgian Technical university has developed transparent qualification requirements for scientific supervisor/co-supervisor, which corresponds to the requirements of the doctoral level and addresses the specifics of the program. Depending on the specifics and development of the field, the scientific co-supervisor of each doctoral student is

equipped with the latest knowledge, although there is no data on their participation in international, different types of conferences or events, as well as the involvement of students in the above-mentioned types of events.

Programme 2 (Chemistry, 3rd level)			
Number of supervisors of Master's/Doctoral theses	These supervisors	Including the supervisors holding PhD degree in the sectoral direction	Among them, the affiliated academic staff
Number of supervisors of Master's/Doctoral theses	14		
- Professor			
- Associate Professor			
- Assistant-Professor			
Invited Staff	1		–
Scientific Staff			–

Evidences/Indicator

- Personal files of supervisors and co-supervisors of master's and doctoral students and documents confirming the research carried out by them
- Publications in internationally refereed journals/creative projects, monographs published in international publications;
- Interview

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s):

- Involvement of both the head of the doctoral program and the doctoral candidate in international events is desirable

Suggestion(s): None

Evaluation

Please, evaluate the compliance of the programmes with this standard component

Component 4.2 Qualification of supervisors of master's and doctoral students	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.
-

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

GTU has developed a system of monitoring and evaluating the staff members every year, which is analyzed and actively used in the evaluation and implementation of the program; The administration checks and evaluates both the lecturer's academic activity and his research productivity, the academic activity is evaluated with both direct and indirect data, and the scientific productivity is checked based on the requirements written in the personnel regulations and training courses.

Description and Analysis - Programme 1 (Chemistry 2nd level)

Monitoring of scientific/research work of academic staff is carried out every year: collection and evaluation of results. Representatives of the quality management service and heads of the department are involved in the above mentioned process. According to the interview, by means of a special questionnaire, on the basis of the students' survey, the current activities of the academic and invited staff are constantly evaluated and analyzed. Based on the analysis of the survey results, they make conclusions and develop ways to identify issues for improvement.

Description and Analysis - Programme 1 (Chemistry 3rd level)

Monitoring of scientific/research work of academic staff is carried out every year: collection and evaluation of results. Representatives of the quality management service and heads of the department are involved in the above mentioned process. According to the interview, by means of a special questionnaire, on the basis of the students' survey, the current activities of the academic and invited staff are constantly evaluated and analyzed. Based on the analysis of the survey results, they draw conclusions and develop ways to identify issues for improvement. However, evidence of survey results and planning documentation is not provided.

The need to improve the language competence of the academic staff has been identified by the self-evaluation group. The Technical University has a professional development center that offers staff development activities. It is desirable to pay more attention to the training of personnel, providing them with international training and seminars in order to raise their qualifications. It is also desirable to have mechanisms for retaining and encouraging qualified personnel, It is desirable to improve the material resources in order to facilitate the implementation of scientific/research/performance-creative activities by the staff.

Evidences/Indicators

- Rules for planning, developing, evaluating and developing the educational program at the Georgian Technical University (GTU Academic Council dated September 23, 2019);
- Component evidence/indicators including relevant documents.
- Interview results

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and Suggestions according to the programmes (if any):

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s):

- It is desirable to pay more attention to the training of the staff regarding the modern approach to teaching. Material resources to facilitate the implementation of scientific/research/performance-creative activities by staff should also be improved.

Suggestion(s): None

Evaluation

Component 4.3 Professional development of academic, scientific and invited staff	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.4. Material Resources

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

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

Master's and doctoral educational programs are provided with library, material and digital resources, which quantitatively and qualitatively ensure the achievement of the goals and learning outcomes of the educational programs grouped in the cluster;

Georgian technical University has library that have and maintain sufficient and appropriate print and electronic

books/journals which are available for students, invited, and academic staff. The collection of printed and electronic media of GTU Central Library is diverse, The basic literature mentioned in the syllabus is available in the university library. The books in the library are processed in accordance with the library rules; The library has a reading hall equipped with computers (the students have the opportunity to use the and appropriate staff. In the reading hall, students have the opportunity to use the internet and various international electronic resources. The library's electronic catalog and literature search system are available on the university's website for any user. In addition, students and staff have access to products offered by Elsevier - scientific databases: ScienceDirect and Scopus, Cambridge University Press, Royal Society Publishing – journals, Bioone, IMF eLibrary, SAGE Journals, Edward Elgar Publishing, Duke University Press, Massachusetts Medical Society, Polpred.com Mass Media Review; According to the self-evaluation document and the interview, in order to achieve the results planned by the program, significant attention is paid to the laboratory activities and practical seminars, which is carried out in the scientific-research laboratories of the faculty by the physical-chemical analysis research of the Institute of Inorganic Chemistry and Electrochemistry named after Rafiel Agladze of TSU and in the central chemical-microbiological testing laboratories of "Georgian Water and Power", based on the agreements signed with them.

Description and Analysis - Programme 1 (Chemistry 2nd level)

The educational programs grouped in the program are provided with library, information and digital resources, which quantitatively and qualitatively ensure the achievement of the goals and learning outcomes of the educational programs; Students are informed about the possibility of using existing resources and the rules of their uses; The program is served by 15 teaching-scientific laboratories located in the II building area and in partner organizations, such as R. Agladze Institute of Inorganic Chemistry and Electrochemistry and central chemical-microbiological testing laboratories of "Georgian Water and Power", based on the agreements signed with them. In particular, a conductometer with Aqualytic AL15 electrodes, a turbidimeter AL250 T-IR, a gas chromatograph Agilent GC - MS - DID, a spectrophotometer Hach DR-6000, Ion chromatograph DIONEX ICS-1100, atomic absorption spectroscope - AAnalyst-200 (PerkinElmer) device; X-ray fluorescence spectroscope - EDX3600H Mining Analyzer device; X-ray phase - ДРОН-3М device; infrared spectroscope - FT-IR spectrophotometer TENSOR II; Analytical electric balance - SARTORIUS, SECURA 124-1CEU; photocolormeter (to determine the color intensity of the solution); spectrometer in the visible spectrum of light;

The experts visited only the laboratories located in the second building of the GTU, during the visit it was revealed the importance of update the laboratory equipment and infrastructure.

Description and Analysis - Programme 1 (Chemistry 3rd level)

The educational programs grouped in the program are provided with library, information and digital resources, which quantitatively and qualitatively ensure the achievement of the goals and learning outcomes of the educational programs; Students are informed about the possibility of using existing resources and the rules of their uses; The program is served by 15 teaching-scientific laboratories located in the II building area and in partner organizations, such as R. Agladze Institute of Inorganic Chemistry and Electrochemistry and central chemical-microbiological testing laboratories of "Georgian Water and Power", based on the agreements signed with them. In particular, a conductometer with Aqualytic AL15 electrodes, a turbidimeter AL250 T-IR, a gas chromatograph Agilent GC - MS - DID, a spectrophotometer Hach DR-6000, Ion chromatograph DIONEX ICS-1100, atomic absorption spectroscope - AAnalyst-200 (PerkinElmer) device; X-ray fluorescence spectroscope - EDX3600H Mining Analyzer device; X-ray phase - ДРОН-3М device; infrared spectroscope - FT-IR spectrophotometer TENSOR II; Analytical electric balance

- SARTORIUS, SECURA 124-1CEU; photocolorimeter (to determine the color intensity of the solution); spectrometer in the visible spectrum of light;

The experts visited only the laboratories located in the second building of the GTU, during the visit it was revealed the importance of update the laboratory equipment and infrastructure.

There was not provided the plan for improving the material and technical resources, with reference to the provision of appropriate financial resources.

Evidences/Indicators

- Central library of GTU <https://gtu.ge/Library>
- GTU library website <http://gtu.ge/Library/>
- Agreements with partner organizations
- The material-technical resources of the GTU
- Interview results

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and Suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): To improve the material and technical resources of the laboratories located in the II building of GTU; The institution should develop a strategic plan for the improvement of the material and technical resources, with reference to the provision of appropriate financial resources.

Suggestion(s): Partner research organizations are equipped with high-tech, international standards-compliant equipment, which GTU students have the opportunity to use, although it is desirable for the university to strengthen its own material and technical resources.

Programme 2 Chemistry, PhD

Recommendation(s): To improve the material and technical resources of the laboratories located in the II building of GTU; The institution should develop a strategic plan for the improvement of the material and technical resources, with reference to the provision of appropriate financial resources.

Suggestion(s): Partner research organizations are equipped with high-tech, international standards-compliant equipment, which GTU students have the opportunity to use, although it is desirable for the university to strengthen its own material and technical resources.

Evaluation

Please, evaluate the compliance of the programmes with this standard component

Component 4.4 Material resources	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4.5. Programme/Faculty/School Budget and Programme Financial Sustainability

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

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

Educational programs "Chemistry" are financed in accordance with the uniform university rules. Finances for the program are defined in the university budget, which is approved by the representative council of Georgia Technical University; The budget is calculated by the Manager's Office of the Faculty of Chemical Technology and Metallurgy and is calculated according to the teaching and research components of the program. The program costs include: academic, guest and support personnel salary and full-time workload, infrastructural costs for the development of the program during the year.

Description and Analysis - Programme 1 (Chemistry 2nd level)

The 2023 budget of the master's program "Chemistry" is not presented, the 2022 budget includes only the income of the program. It is also better to specify the amount of money intended for graduate studies in the document. It is desirable that the budget of the faculty for the following years should reflect in detail the costs of financial provision of the measures planned for the development of the program;

Description and Analysis - Programme 1 (Chemistry 3rd level)

The 2023 budget of the Doctoral program "Chemistry" is not presented, the 2022 budget includes only the income of the program. It is also better to specify the amount of money intended for graduate studies in the document. It is desirable that the budget of the faculty for the following years should reflect in detail the costs of financial provision of the measures planned for the development of the program;

Evidences/Indicators

- the budget of the Faculty of Chemical Technology and Metallurgy;
- Budget (2022) of the master's degree educational program "Chemistry" Appendix 10
- Budget of doctoral educational program "Chemistry" (2022) Appendix 10

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and Suggestions according to the programmes:

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s)

- It is preferrable to present the 2023 budget for the master's program, where the amount of funds intended for research planned in the program will be described in detail.

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s):

- It is preferrable to present the 2023 budget for the doctoral program, where the amount of funds intended for research planned in the program will be described in detail.

Evaluation

Component 4.5 Programme/faculty/school budget and programme financial sustainability	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compliance of the programmes with the standards

4. Providing Teaching Resources	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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5. Teaching Quality Enhancement Opportunities

In order to enhance teaching quality, programme utilizes 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 quality assurance results for programme improvement.

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

Based on the University's Self Evaluation Report, the management of the university constantly takes care of strengthening the quality assurance function and establishment of quality culture in the university. Quality assurance system at Georgian Technical University is based on PDCA cycle. Assurance of internal quality is implemented by the faculty quality assurance services of the university in coordination with the quality assurance service of the university. The aim of internal quality assurance service is to permanently improve the quality of educational activity at university and to enhance the quality culture.

In relation to the programmes, there is a the rules of Planning, Elaboration, Evaluation and Development of the educational program, which also describes the procedures for approving programmes, making changes and asses them. Planning of new educational programmes and evaluation/development of current educational programmes 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 programmes are carried out according to the established rules for approving the programme.

Based on regulations of Quality Assurance Service of Georgian Technical University the process of establishment of the programme is based on the complex analysis. During the interview, it was confirmed that the self-evaluation group were involved in the development of programmes within the cluster. In the analysis of the results of the programmes are used quantitative data (survey).

It was confirmed during the interview that academic and invited staff implementing educational programmes, students and graduates, administration of faculty and quality assurance service of the university participate in the evaluation process of the programme. Self-evaluation team members and programme leaders confirmed that some student feedback was used in programme development. The changes touched on specific subjects, strengthening of practical and research components, etc. This connection was not very strong, but it exist. For Future Development of the program is also very important more collaboration between Participants.

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.

It was very remarkable the role of the central Quality Assurance Service of Georgian Technical University. For further development, however, it is also very important that the Faculty quality assurance office manages such processes stronger and help academic Staff to develop the Programms.

Evidences/Indicators

- Questionnaire forms for students', graduates', employers', and staff surveys;
- Interviews;
- Regulation of Quality Assurance Service of Georgian Technical University;
- Internal mechanisms of quality assurance approved by the resolution;
- Rules for planning, drawing up, evaluating and developing educational programs.

General recommendations of the cluster:

- For further development is very important that the Faculty quality assurance office manages processes stronger and help academic Staff to develop the Programms, however more collaboration between Participants.

General suggestions of the cluster:

- none

Recommendations and Suggestions according to the programmes (if any):

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 5.1 Internal Quality Evaluation	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.2. External Quality Evaluation

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

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

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

STU's Master's Program in Chemistry was granted conditional accreditation for a period of two years by the decision of the Accreditation Council (#595607, 18.06.21) and it was given 24 recommendations.

The self-assessment report does not provide information on the implementation about the recommendations, however, based on reviewing documents and the interview, the Experts analyzed the issue of the implementation of the recommendations.

It is obvious that there are recommendations that are not included in the presented program. (For example, to the qualification requirements for academic staff, publications reflected in international scientific bases (Scopus and Web of Science) should be added; Also, the institution should develop a specific plan for the improvement of the material and technical base, with the indication of providing appropriate financial resources).

As for the doctoral educational program, it was granted conditional accreditation for a period of 2 years by the decision of the Council #686978, 08.07.21, and 21 recommendations were determined. There are also recommendations that are not included in the presented program. (For example, To correct the inconsistency between the "Professor's Assistantship" syllabus and the assessment forms provided for in Annex 1 of the same syllabus; In addition, attendance at the lecture-seminars provided for in Annex 1 is not a relevant method of evaluating learning outcomes; Review the requirements for the Phd student's supervisor - add to it the publication published in the last 5 years (visible in the international scientific bases of Scopus and Web of Science), regarding of the research topic).

It was confirmed that academic and administrative staff involved in the program regularly use the results of external quality assessment. Review and implement recommendations received during accreditation, which is the primary basis for modifying the program. During the interviews it was confirmed that the quality assurance office tries to reflect the results of the projects in the daily processes. Results are share in working groups.

In relation to the programmes was several external evaluation reports from field experts. Remarkably information about it were not mention in Self Evaluation Report clearly. But during the Interviews it was confirmed, that the academic staff, also self evaluation group members were informed about the Results of external evaluation. 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 programme development process, where they had the opportunity to share their experiences.

Therefore, for the further development of the program, it is important to use a external evaluation system complexly, including taking into account the recommendations received in the accreditation-authorization processes, as well as peer evaluation.

Evidences/Indicators

- Quality Assurance Service provisions, guidelines, and reports;
- Inerwievs;
- Questionnaire forms for students', graduates', employers', and staff surveys;
- Results students', graduates', employers', and staff surveys;

General recommendations of the cluster:\

- for the further development of the program, it is important to use a external evaluation system complexly, including taking into account the recommendations received in the accreditation-authorization processes, as well as peer evaluation.

General suggestions of the cluster:

- None

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 5.2 External
Quality Evaluation

**Complies with
requirements**

**Substantially
complies with
requirements**

**Partially complies
with requirements**

**Does not comply
with requirements**

Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.

Cluster and individual evaluation

Summary and Analysis of the Compliance of the Educational Programmes Grouped in a Cluster with the Requirements of the Standard Component

According to the regulations and documents of the university monitoring and evaluation of the implementation of educational programmes of Faculty is a systematic process initiated by the GTU Quality Assurance Service and in the evaluation process of the implementation of the educational programme, the following stakeholders are involved: a) Students b) Academic/invited staff involved in the implementation of the programme c) Employers d) Graduates of the programme and others.

It has been confirmed that the students and professors participate in the various surveys. The faculty of chemical technology and metallurgy has a "faculty committee for the evaluation of educational programs" involving academic staff and students, which periodically evaluates the structure and content of the educational program. Its provision with appropriate human and material resources, compliance with established standards and self-evaluation in the university.

The university has appropriate mechanisms for evaluating learning outcomes. In evaluating the learning results, they are using also an indirect evaluation method, self-evaluation by the student. As a result of the analysis of all assessment components, a program will be prepared for modification.

Monitoring and periodic evaluation of the implementation of educational programmes is the following varied indicators and for the programmes will be conducted by the quality assurance service of the faculty.

During the interviews it was confirmed, that not only central quality assurance office, but also faculty quality office realize strength and weaknesses of the Program and they are confirmed readiness to work on it.

Evidences/Indicators

- Interviews;
- Regulation of Quality Assurance Service of Georgian Technical University;
- Resolution on faculty commissions for evaluation of educational programs;
- Student survey results.

General recommendations of the cluster: None

General suggestions of the cluster: None

Recommendations and Suggestions according to the programmes (if any):

Programme 1 Chemistry, Master

Recommendation(s): None

Suggestion(s): None

Programme 2 Chemistry, PhD

Recommendation(s): None

Suggestion(s): None

Evaluation

Component 5.3. Programme Monitoring and Periodic Review	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compliance of the programmes with the standards

5. Teaching Quality Enhancement Opportunities	Complies with requirements	Substantially complies with requirements	Partially complies with requirements	Does not comply with requirements
Programme 1 Chemistry, Master	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programme 2 Chemistry, PhD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Attached documentation (if applicable):

Name of the higher education institution: Georgian Technical University

Name of Higher Educational Programmes, Levels: Master and PhD programs in Chemistry

Compliance of the programmes with the standards

Contents Standard	1. Educational Programme Objectives, Learning Outcomes and their Compliance with the Programme	2. Methodology and Organisation of Teaching, Adequacy Evaluation of Programme Mastering	3. Student Achievements, Individual Work with them	4. Providing Teaching Resources	5. Teaching Quality Enhancement Opportunities
Programme 1 Chemistry, Master	Substantially compliance with requirements	Substantially compliance with requirements	Compliance with requirements	Substantially compliance with requirements	Substantially compliance with requirements
Programme 2 Chemistry, PhD	Substantially compliance with requirements	Substantially compliance with requirements	Compliance with requirements	Substantially compliance with requirements	Substantially compliance with requirements

Signatures

Chair of Accreditation Experts Panel

Carlo Adamo, signature



Of the member(s) of the Accreditation Experts Panel

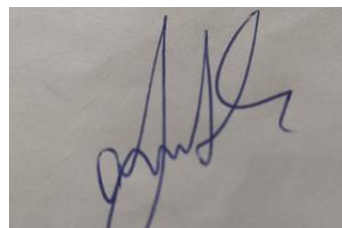
Inga Bochoidze, signature



Sopiko Patsatsia, signature



Tamta Kobakhidze, signature



Giorgi Mgvdeladze, signature

