



განათლების ხარისხის განვითარების ეროვნული ცენტრი  
NATIONAL CENTER FOR EDUCATIONAL QUALITY ENHANCEMENT

## Accreditation Expert Group Report on Higher Education Programme

### Higher Education Programme Name

Chemistry  
Bachelor Program

### HEI's Name

Ivane Javakhishvili Tbilisi State University

### Date(s) of Evaluation

18/10/2019

### Report Submission Date

3/12/2019

Tbilisi  
2019

## HEI's Information Profile

Name of Institution Indicating its Organizational Legal Form	Ivane Javakhishvili Tbilisi State University
HEI's Identification Code	204864548
Type of Institution	University

## Higher Education Programme Information Profile

Name of the Programme	Chemistry
Level of Education	Chemistry
Qualification Granted Indicating Qualification Code	Bachelor Program 0531
Language of Instruction	Bachelor of Science (BSc) in Chemistry
Number of Credits	English
Programme Status (Authorized/ Accredited/New)	240

## Expert Panel Members

Chair	Prof. Carlo Adamo,	Chimie ParisTech, France
Member	Prof. Giorgi Titvinidze	Agricultural University of Georgia, Georgia
Member	Dr. Elina Bakradze	Laboratory National Environmental Agency Georgia
Member	Mr. Aleksandre Pichkhadze	Agricultural University of Georgia, Georgia

## Accreditation Report Executive Summary

### ▪ **General information on the education programme**

The accreditation concerns an education program in Chemistry, at bachelor level. The program is designed in accordance with the current regulation of TSU and it was developed from the previous experience of the program implemented in San Diego State University for 5 years in Georgia. Its goals are 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

All stakeholders (staff and students) were engaged in the development of the program and its adaptation to local regulations: academic and administrative personnel, students and employers.

The total number of attributed credits is 240, divided in 57 for general required courses, 141 for specialty required courses, and 42 electives.

All the courses will be given in English and the knowledge of this language is a prerequisite

### ▪ **Brief overview of the accreditation site-visit**

The visit was held on Oct. 18 from 9:00 am to about 17:30. It started in the morning with the meeting with the representative of University Administration, namely Deputy Chancellor Mr. Lasha Saghinadze, the Dean of the Faculty of Exact and Natural Sciences Ramaz Khomeriki and the Head of TSU Quality assurance department Mrs. Irma Grdzeldze. The discussion was focused on the general context of the program and on the engagement of the TSU and Faculty in supporting it.

Then the members of the Self-Evaluation Team, including Wiliam Tong (via skype), were interviewed on the weak and strong points of the program, as well as on specific aspects of the SER. Next, details about the organization of the program and contents of the courses were discussed with the program director, Giorgi Jibuti. 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, Prof. Jibuti guided the expert in a tour of the facilities available to the program, including all the laboratories and some classrooms. The meetings with students and graduates of the analogous Georgian program taken place after. The discussion was centered on their feedback about the followed program, the reason of their choice, and their actual status. During the meeting with employers some aspects concerning their expectations from the program and graduated students were considered. The quality assurance unit representatives illustrated their procedures for verify the quality of TSU programs and the feedback mechanisms. The day ended with a first feedback of the visit to the program director and University representative.

### **Summary of education programme's compliance with the standards**

The program respects most of the standards required for the accreditations. Indeed, its objectives are of high quality, as it could be expected by an ambitious program in Chemistry. They are well within the mission of TSU and its strategic plan, that is to provide higher education based on science and the best international experience. Such objectives are clearly illustrated in the Self-evaluation Report (SER) and were confirmed during the visit.

The program has a clear and logic structure with courses organized in three groups, namely general, specialty and elective. It follows a sequence, where courses have admission preconditions (if available) and ensure step-by-step achievement of learning outcomes. It should be remarked, however, that the offer of lective course related to chemistry is low.

The program is implemented using modern student-centered and flexible teaching methods, including: electronic teaching, flip-classes, seminars and laboratory work. Globally, it fits into the standard requirements concerning learning outcomes expected for a program in Chemistry. Indeed, course contents (both theory and lab practice) are generally adequate they will ensure to reach the learning outcomes. The facilities (laboratories) of the program are excellent. For some courses, however there is a lack of seminars, while some topics are very compresses in a small number of hours. Evaluation criteria are clearly indicated to students and evaluators, so that they can be considered fair and transparent.

The program reports a detailed student support services acting in a very effective level at three distinct levels, namely Faculty, Chemistry Department and Chemistry Program.

All the Academic and invited staff have a significant teaching experience and their qualification is in line with the TSU regulations and Georgian legislation. It should be noticed however that there is a certain degree of inhomogeneity in the scientific level of the staff and in some fields the staff is too small in number. The program director has all the experience and motivation to lead the program. The administrative and support staffs are of high quality and adequate in number.

The budget is coherent with the needs of the program and the allocation of financial resources is adequate, provided that the foreseen number of foreign students is reached. Concerning the different budget items, it should be noticed that no specific resources are allocated to the professional development of the staff and to the research carried out by the students during their research stages. A financial support of the Faculty could be necessary for assuring the sustainability of the program during the first years.

All the quality control mechanisms are already in place and of high-quality.

#### ▪ **Summary of Recommendations**

The recommendation of the experts are:

- Program with this much potential for Georgia and region which probably can be the sole holder of ACS accreditation should receive a larger financial support from the university, especially during the first years. It is particularly relevant for the maintaining of the standard of the labs and equipment, which will be critical for program development and attiring new students
- Correction of some syllabi are in order as discussed in the report, while some topics should be treated in more details. Also teaching methodology should be clearly described in the syllabi
- The offer in organic chemistry research projects should be strengthened, through the involvement of external or internal staff.
- A part of the budget should be allocated to the professional development of the involved staff.

#### ▪ **Summary of Suggestions**

The most relevant suggestions done by the expert panel are:

- The program should be strongly supported by TSU administration, especially in terms of recruitments, in order to strengthen the envisaged objectives.
- Larger implication of other local lecturers not involved in the current program, including professionals from other Georgian Universities, which will strengthen some of the courses (such as Organic and Physical Chemistry) and enlarging the formation offer with minimal impact of the budget.
- Similar preconditions for English knowledge should be assured for Georgian and foreign students in order to keep a homogeneous level among students.
- The increased awareness on employment and career development opportunities of students in Chemistry should be improved through specific actions.
- Either the amount of lab assistants should be increased, or it should be made clear that the student class are going to be split in small groups.
- Since the program is new program director should control some aspects like: student support services and the interaction with the TSU quality committee.
- Specific actions for the development of the staff in the Chemistry program should be envisaged by the program Director. Furthermore, the career development of the staff should be constantly monitored, in order to maintain the quality of the Chemistry Program.
- A large awareness of the program in foreign countries will contribute to attract external students thus improving its economical self-sustainability

- Agreement with potential private employers for financing specific part of the program could be envisaged

- **Summary of best practices**

The program has several best practices, which are:

- The program facilities (laboratories, instruments) provided to the students are of very high quality and at the level of excellent foreign universities.

- **In case of accredited programme, summary of significant accomplishments and/or progress**

- NOT APPLICABLE

## 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 in order to improve the programme.

#### 1.1 Programme Objectives

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

##### **Descriptive summary and analysis of compliance with standard requirements**

The general program objectives are well described within the mission of TSU and its strategic plan, that is to provide higher education based on science and the best international experience. Indeed, TSU forms professionals who successfully accomplish all their functions, locally as well as internationally. Furthermore, university strives for a student centered learning environment, where autonomy and independence are the mean values to realize the mission. Concerning the Program in Chemistry, the goals are to prepare specialists with:

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

These objectives are reached using the certification standards of the American Chemical Society (ACS). Such objectives are clearly illustrated in the Self-evaluation Report (SER) and were confirmed during the visit. They are of high quality and respect both ACS and international compliances, as it could be expected by an ambitious program in Chemistry. The program is, therefore, expected to form students able to work in both professional and academic environments not only of national, but also of international level.

##### **Evidences/indicators**

- The objectives are clearly indicated in the SER and they are convincing.
- The syllabi well reflect the quality of course and the ACS standards
- Interviews with the TSU representative, director of the program and the self-evaluation team well indicated the commitment of all the parties
- Mission of TSU ([https://www.tsu.ge/ge/about/mission\\_statement/](https://www.tsu.ge/ge/about/mission_statement/))
- ACS Guidelines
- 

##### **Recommendations:**

- The committee has no recommendations on this part

##### **Suggestions for programme development:**

- The program has a number of strong points, including excellent facilities, which make it an unique opportunity for the Department of Chemistry and, above all, TSU. Indeed, it will be, if approved, the first program in Chemistry in English, thus opening TSU competences to foreign audience. Nevertheless, it should be strongly supported by TSU administration, especially in term of recruitments, in order to strength the envisaged objectives.

<ul style="list-style-type: none"> <li>○ Larger implication of other local lecturers not involved in the current program, including professionals from other Georgian Universities, which will strengthen some of the courses and enlarging the formation offer with minimal impact of the budget.</li> <li>○ A clear strategy for international recruitment should be defined.</li> </ul>
<p><b>Best Practices (if applicable):</b></p> <ul style="list-style-type: none"> <li>○ The program facilities (laboratories, instruments) provided to the students are of very high quality. This of course helps program to achieve its goals and targets.</li> </ul>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <p style="text-align: center;"><b>NOT APPLICABLE</b></p>
<p><b>Evaluation</b></p> <p style="padding-left: 40px;"><input checked="" type="checkbox"/> Complies with requirements</p> <p style="padding-left: 40px;"><input type="checkbox"/> Substantially complies with requirements</p> <p style="padding-left: 40px;"><input type="checkbox"/> Partially complies with requirements</p> <p style="padding-left: 40px;"><input type="checkbox"/> Does not comply with requirements</p>

<p><b>1.2. Programme Learning Outcomes</b></p> <ul style="list-style-type: none"> <li>➤ Programme learning outcomes describe knowledge, skills, and/or the sense of responsibility and autonomy, students gain upon completion of the programme;</li> <li>➤ Programme learning outcomes assessment cycle consists of defining, collecting and analysing data;</li> <li>➤ Programme learning outcomes assessment results are utilized for the improvement of the programme.</li> </ul>
<p><b>Descriptive summary and analysis of compliance with standard requirements</b></p> <p>The program fulfills all the compliances required. Indeed, after completion of the program the graduates will be able to:</p> <ol style="list-style-type: none"> <li>i) Formulate key facts, concepts and principles of fundamental fields of chemistry</li> <li>ii) Describe functions and design of chemical tools</li> <li>iii) Classify materials, their composition and changes from microscopic to macroscopic scale.</li> </ol> <p>Students will also learn hard and soft skills, such as working effectively and safely in the laboratory; conducting stoichiometric, analytic, thermodynamic, kinetic calculations; working on projects of different type in groups as well as individually; demonstrate own knowledge orally as well as in a written manner. They will be also able to independently plan and implement chemical experiments, describe conducted laboratory work or research, critically analyze modern theories and information in chemistry to resolve problems identified and carry out professional work with high level of responsibility.</p> <p>Such criteria stem from the previous experience of the chemistry-biology program of San Diego State University, which was successfully implemented and developed in the native university for several decades. The program, therefore, clearly fits into the standard requirements concerning learning outcomes.</p>
<p><b>Evidences/indicators</b></p> <ul style="list-style-type: none"> <li>○ The objectives of the program learning outcomes are clearly detailed in the SER and they are convincing.</li> </ul>

<ul style="list-style-type: none"> <li>○ Interviews with the director of the program, the teaching staff and self-evaluation team clearly indicated the target learning outcomes, as well as the global engagement of whole staff in reaching them</li> </ul>
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>○ The committee has no recommendations on this part</li> </ul>
<p><b>Suggestions for programme development:</b></p> <ul style="list-style-type: none"> <li>○ A major focus on the challenges of the marketplace would also benefit for the student formation to future career prospects.</li> </ul>
<p><b>Best Practices (if applicable):</b></p>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <ul style="list-style-type: none"> <li>○ NOT APPLICABLE</li> </ul>
<p><b>Evaluation</b></p> <p><input checked="" type="checkbox"/> Complies with requirements</p> <p><input type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>

### Programme's Compliance with Standard

Standard	Complies with Requirements	Substantially complies with requirements	Partially Complies with Requirements	Does not Comply with Requirements
Educational programme objectives, learning outcomes and their compliance with the programme	X			

## 2. Teaching methodology and organization, adequate evaluation of programme mastering

Programme admission preconditions, programme structure, content, teaching and learning methods, and student assessment ensure the achievement of programme objectives and intended learning outcomes.

<b>2.1. Programme Admission Preconditions</b>
Higher education institution has relevant, transparent, fair, public and accessible programme admission preconditions.
<b>Descriptive summary and analysis of compliance with standard requirements</b>  In the SER the Program admission preconditions are clearly stated, that is Unified National Exams for Georgian citizens and those reported in the Georgia legislation for foreign students. Details are also given about the level of English language required for the enrollment of international students, but it's not specified for Georgian students. During the interview with the program director we have found that this issue was already taken in account and there is clear plan for solving this issue by requesting certain points in the English exam taken within Unified National Exams. Such preconditions are expected to be easily accessible to the interested students and fair. Furthermore, Program courses were conceived keeping in mind course admission preconditions. The envisaged program admission preconditions are in compliance with the required standards
<b>Evidences/indicators</b> <ul style="list-style-type: none"><li>○ Admission preconditions are reported in the SER</li><li>○ Interview with the Program director clarified some details on the preconditions.</li></ul>
<b>Recommendations:</b> <ul style="list-style-type: none"><li>○ The committee has no recommendations on this part</li></ul>
<b>Suggestions for programme development:</b> <ul style="list-style-type: none"><li>○ Similar preconditions for English knowledge should be assured for Georgian and foreign students in order to keep a homogeneous level among students.</li><li>○ All the preconditions thresholds should be available for public to get information on it.</li></ul>
<b>Best Practices (if applicable):</b>
<b>In case of accredited programme, significant accomplishments and/or progress</b>  NOT APPLICABLE
<b>Evaluation</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Complies with requirements</li><li><input type="checkbox"/> Substantially complies with requirements</li></ul>

Partially complies with requirements

Does not comply with requirements

## 2.2 Educational Programme Structure and Content

Programme is designed according to HEI's methodology for planning, designing and developing of educational programmes. Programme content takes programme admission preconditions and programme learning outcomes into account. Programme structure is consistent and logical. Programme content and structure ensure the achievement of programme learning outcomes. Qualification to be granted is consistent with programme content and learning outcomes.

### **Descriptive summary and analysis of compliance with standard requirements**

The program has a clear and logic structure which is in compliance with the TSU regulation. Following a similar program of the San Diego State University, it also fulfills most of the ASC requirements.

The structure of the program is based on three course groups, namely general, specialty and elective courses. English, calculus and informatics classes are considered as necessary and are included in the first group. Specialty (core) courses were designed in line with Georgian and American standards. These courses will enable graduates to continue education, research and pursue career in chemistry. Finally, the third group is composed by a number of "general culture" classes, including politics, economics, history and philosophy. Their aim is to complete the knowledge of the students and expand their cultural horizons.

The structure of the program follows a sequence, where courses have admission preconditions (if available) and ensure step-by-step achievement of learning outcomes.

The program uses 240 ECTS credits, which are divided in 57, 141 and 42 for general, specialty and elective courses, respectively.

Overall the system is clear, well-structured and logical. The repartition between the three category of courses is also adequate. Only, it should be remarked that currently there is only one elective course related to chemistry and in case of interest from the student side, there is no other choice. During the visit it was found, that this is planned.

### **Evidences/indicators**

- The structure and content of the program are well illustrated in the SER, Syllabi and program structure.
- The interviews with director of the program and academic staff will evidenced the strengths of the program structure. Weaknesses on the elective courses were also discussed and envisaged solutions were exposed

### **Recommendations:**

- The committee has no recommendations on this part

### **Suggestions for programme development:**

- The number of elective courses in Chemistry should be increased.

### **Best Practices (if applicable):**

- NOT APPLICABLE

### **In case of accredited programme, significant accomplishments and/or progress**

- NOT APPLICABLE

## Evaluation

Please mark the checkbox which mostly describes your position related to the programmes compliance with this specific component of the standard

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

## 2.3 Course

- Student learning outcomes of each compulsory course are in line with programme learning outcomes; Moreover, each course content and number of credits correspond to course learning outcomes;
- Teaching materials listed in syllabi are based on the core achievements in the field and ensure the achievement of intended programme learning outcomes.

### Descriptive summary and analysis of compliance with standard requirements

All the information about the courses, including goals, preconditions, learning outcomes and teaching methods, are clearly defined in the syllabi. The achievement of learning objectives is assessed on criteria clearly listed in each syllabus. Globally there is a coherence between the course content and the number of credits given. Course contents (both theory and lab practice) are in line with TSU and ACS requirements and they will ensure reaching learning outcomes. The courses are divided in lecture, seminar and laboratory work, their relative ratio varying with the course topic. Each of the courses has contact as well as individual hours, which are appropriate to learning materials and reaching learning outcomes. Ratio between contact and individual hours is defined based on specifics of the course, its content and learning materials

It should be noticed that seminars for most chemistry subjects (CHEM 100, 201, 232, 432, 251, 560, 410 A, 410 B, 550, 520 B, 417) are not carried out. During the visit it was found that the seminar work is mainly done within lectures, lab courses and by help-desk. Interestingly, in contrast to most chemistry subjects, all physical subjects include seminar work (PHYS 100, PHYS 195 and PHYS 196).

Furthermore, the Content of some lectures is highly compressed making very difficult to cover all key aspects. In particular:

- a) CHEM 550 – Instrumental Methods of Chemical Analysis : we do not find one lecture enough to give reasonable knowledge in one or another extremely important analytical methods such as NMR and IR (lecture 29 and 15). In spite of the fact that some topics are included in organic chemistry course, assigned time for these two lectures seem not be adequate.
- b) CHEM 538 - Polymer chemistry: A number of key topics and methods are grouped in two lessons (Lecture 8 & 9). Instead, the content of the Lecture 28 and Lecture 30 seems to be broad to cover in a reasonable way in one lecture. Furthermore, apparently there is not mact between a significant part of laboratory work for the given course and lecture topics. In particular Laboratory 8 to 12 are about preparation and characterization of composites, but no lessons are envisaged on this topic.
- c) CHEM 410A and 410B. Classical Thermodynamics is compressed in few lectures and Electrochemistry is not sufficiently developed. The same holds for Quantum chemistry, whose laboratories are also very condensed.

<p><b>Evidences/indicators</b></p> <ul style="list-style-type: none"> <li>○ All the information about the courses in the syllabi and discussed in the SER</li> <li>○ The course structures and contents were discussed with the program director, academic and invited staff.</li> </ul>
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>○ Correction of some syllabi as discussed above</li> <li>○ Decompress several lectures, or even add in-depth studies of subjects as elective courses.</li> </ul>
<p><b>Suggestions for programme development:</b></p> <ul style="list-style-type: none"> <li>○ Enlarge offer in Physical chemistry to include appropriate course in Quantum Chemistry, Classical Thermodynamics and Electrochemistry. These topics, spread in different courses, are not sufficiently treated in the program, despite their relevance in chemistry</li> </ul>
<p><b>Best Practices (if applicable):</b></p> <ul style="list-style-type: none"> <li>○ Facilities available to the program are up-to date and at the level of excellent foreign universities.</li> </ul>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <ul style="list-style-type: none"> <li>○ NOT APPLICABLE</li> </ul>
<p><b>Evaluation</b></p> <p><input type="checkbox"/> Complies with requirements</p> <p><input checked="" type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>

#### **2.4 The Development of practical, scientific/research/creative/performance and transferable skills**

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

##### **Descriptive summary and analysis of compliance with standard requirements**

The program was designed so to pay a special attention to the development of practical skills of the students. Indeed, most of the specialty courses include lab works, where students will all the practical aspect of Chemistry. Furthermore, students will have the opportunity to be engaged into existing scientific-research groups of their interest at the faculty (or partner entities) and directly participate in (advanced) research process. These research activities are supervised by the research group supervisor, which assesses the knowledge and skills generated by the student.

Looking more in details to the different fields, it should be noticed that in inorganic chemistry, polymer chemistry and biochemistry, academic staff is capable to support the transfer of appropriate researcher skills to the students. Furthermore, research in the field of instrumental methods for chemical analysis is supported by extremely well-equipped laboratories and the number of equipment guarantees that students will be able to work without hindering, will be involved in the research projects and will get excellent skills. More complicated is the situation for Organic and Physical Chemistry where the amount of the involved staff is not sufficient and/or they are not sufficiently qualified for offering adequate transfer of the research skills. Therefore, some problems could be expected in the supervision of high-level senior projects in these fields, due this limited experience of the staff. In addition, the amount of the staff in organic chemistry by itself limits the research variety and makes the program less sustainable.

**Evidences/indicators**

- The transfer of the required skills to student is clearly reported in the SER and detailed in the course syllabi
- The research competences and the offer of research projects were discussed with the Academic staff.
- The CVs of the staff involved in the program are a clear indication of research skills and competences at the Chemistry Department.
- Interviews with the students of the San Diego program evidenced their interest in research project in many research fields, including Organic Chemistry

**Recommendations:**

- Strengthening the offer in organic chemistry research projects, through the involvement of external or internal staff.

**Suggestions for programme development:**

- An effective way to increase the offer in physical chemistry could be the involvement of external staff and/or partners.

**Best Practices (if applicable):**

- The program is supported with all necessary equipment for conducting high level student research in all above listed fields.

**In case of accredited programme, significant accomplishments and/or progress**

- NOT APPLICABLE

**Evaluation**

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

## 2.5 Teaching and learning methods

Program is implemented using student centered teaching and learning (SCL) methods. Teaching and learning methods correspond to the level of education, course content, student learning outcomes and ensure their achievement.

### **Descriptive summary and analysis of compliance with standard requirements**

The program is implemented using student-centered and flexible teaching methods, including: electronic teaching, flip-classes, seminars and laboratory work. Courses also uses a mix of methods like discussion, presentation, explanation learning, brainstorming, analysis and synthesis. While this organization is generally effective, some drawbacks should be evidenced. In particular:

- Laboratory courses: students work in laboratory individually or in small groups which equips them with skills for independency as well as groupwork. There is question if laboratory assistant number is enough for carrying out the courses in a safe way: a) CHEM 200, CHEM 201, CHEM 520 B and CHEM 538, each of this course has single laboratory assistant. During the interview with the program director we have found that classes will be split in 12-15 students depending on the total amount of the students, but this is not well described in curriculum;
- Laboratory in CHEM 410A, CHEM 232 and CHEM 432 are carried out without any assistance, which could affect the quality and especially safety of the course.

### **Evidences/indicators**

- The syllabi clearly report the lesson/seminar/lab hours
- The SER illustrates in a detailed way the general features of the teaching and learning methods.
- During the interview with the program director the teaching approach, relate requirements, shortcomings and possible solutions were discussed in some deep.

### **Recommendations:**

- A better clarification in the program on the content of lectures and on teaching methodology should be clearly described in the syllabi.

### **Suggestions for programme development:**

- Either the amount of lab assistants should be increased or it should be made clear that the student class are going to be split in small group.

### **Best Practices (if applicable):**

- NOT APPLICABLE

### **In case of accredited programme, significant accomplishments and/or progress**

- NOT APPLICABLE

### **Evaluation**

- Complies with requirements
- Substantially complies with requirements

Partially complies with requirements

Does not comply with requirements

## 2.6. Student Evaluation

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

### **Descriptive summary and analysis of compliance with standard requirements**

The program uses evaluation criteria in line with legislation of Georgia. These criteria are detailed in the syllabus of each and are introduced to the students at the beginning of the course. Evaluation criteria are therefore clear for students and evaluators, so that they are fair and transparent. In any case, students are entitled to request revision of their own (written) work with evaluator/course responsible. If explanation of the evaluation is not satisfying, the student, may request other means of appeal, including the work assessment by another specialist. The only issue encountered concerns the points for attendance, which is highly questionable, because it does not directly reflect the knowledge acquired by the student. This is even more true for laboratory work, which is itself built on student attendance, thus making inappropriate this choice.

### **Evidences/indicators**

- Criteria for student evaluation are clearly described in the SER and in the course syllabi.

### **Recommendations:**

- The committee has no recommendations on this part

### **Suggestions for programme development:**

- Get rid of attendance points on lectures and on laboratory practice, so that points reflect the actual work quality done by student. Eventually some points could be attributed to: *Attendance and involvement* as it is in PHYS 100

### **Best Practices (if applicable):**

- 

### **In case of accredited programme, significant accomplishments and/or progress**

- NOT APPLICABLE

### **Evaluation**

X Complies with requirements

Substantially complies with requirements

Partially complies with requirements

Does not comply with requirements

### Programme's Compliance with Standard

Standard	Complies with Requirements	Substantially complies with requirements	Partially Complies with Requirements	Does not Comply with Requirements
Teaching methodology and organization, adequate evaluation of programme mastering		XX		

### 3. Student achievements and individual work with them

HEI creates student-centered environment by providing students with relevant services; programme staff ensures students' familiarity with the named services, organizes various events and fosters students' involvement in local and/or international projects.

<b>3.1. Student support services</b>
Students receive appropriate consultations and support regarding the planning of learning process, improvement of academic achievement, employment and professional development.
<b>Descriptive summary and analysis of compliance with standard requirements</b>  The program reports a detailed student support services, mainly provided by TSU. In particular, Faculty of Exact and Natural Sciences has a quality assurance service, which provides information on mobility. A two-week orientation course for first-year students is held at the beginning of the semester and students are provided with information on the structure of educational programs as well as their rights and responsibilities. Department of Chemistry has own quality assurance representative, which assists students with selection of individual learning programs, internships and seeking employment opportunities. Finally, program students will receive continuous support and consulting from the lecturers for each course. Every lecturer has individual consulting/office hours, which are identified during creation of schedules and she/he can be contacted by e-mail (indicated in the syllabus). Globally, the student services act in a very effective level at three distinct levels, namely Faculty, Chemistry Department and Chemistry Program.
<b>Evidences/indicators</b> <ul style="list-style-type: none"><li>○ The student services are clearly detailed in the SER and they are convincing.</li><li>○ Interviews with students and graduated from previous Chemistry program confirmed the quality of the envisaged services.</li><li>○ During the interviews the involvement of the Academic and Invited staff clearly appeared.</li><li>○ The student support services were discussed in details during the Meeting with the representative of the faculty quality assurance unit.</li></ul>
<b>Recommendations:</b> <ul style="list-style-type: none"><li>○</li></ul>
<b>Suggestions for programme development:</b> <ul style="list-style-type: none"><li>○ Since the program is new program director should control that the student support services are effective and ready to answer to problems specific to the present Chemistry Program.</li><li>○ The increased awareness on employment and career development opportunities of students in Chemistry should be improved through specific actions. An effective way should be getting advance demands from representatives of chemical industry on kind of specialists needed</li></ul>
<b>Best Practices (if applicable):</b> <ul style="list-style-type: none"><li>○</li></ul>
<b>In case of accredited programme, significant accomplishments and/or progress</b>  NOT APPLICABLE

<p><b>Evaluation</b></p> <p><input checked="" type="checkbox"/> Complies with requirements</p> <p><input type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>
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<p><b>3.2. Master's and Doctoral Student supervision</b></p>
<p>Master's and Doctoral students have qualified thesis supervisors.</p>
<p><b>Descriptive summary and analysis of compliance with standard requirements</b></p> <p>NOT APPLICABLE</p>
<p><b>Evidences/indicators</b></p> <p>NOT APPLICABLE</p>
<p><b>Recommendations:</b></p> <p>NOT APPLICABLE</p>
<p><b>Suggestions for programme development:</b></p> <p>NOT APPLICABLE</p>
<p><b>Best Practices (if applicable):</b></p> <p>NOT APPLICABLE</p>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <ul style="list-style-type: none"> <li>○ Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)</li> </ul>
<p><b>Evaluation</b></p> <p>○ Please mark the checkbox which mostly describes your position related to the programmes compliance with this specific component of the standard</p> <p><input type="checkbox"/> Complies with requirements</p>

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

**Programme’s Compliance with Standard**

Standard	Complies with Requirements	Substantially complies with requirements	Partially Complies with Requirements	Does not Comply with Requirements
Student achievements and individual work with them	XX			

## 4. Providing teaching resources

Programme human, material, information and financial resources ensure programme sustainability, its effective and efficient functioning, and achievement of intended objectives.

<b>4.1 Human Resources</b>
<ul style="list-style-type: none"><li>➤ Programme staff consists of qualified people who have necessary competences in order to help students achieve programme learning outcomes;</li><li>➤ 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. Balance between academic and invited staff ensures programme sustainability;</li><li>➤ The Head of the Programme possesses necessary knowledge and experience required for programme elaboration. He/she is personally involved in programme implementation;</li><li>➤ Programme students are provided with an adequate number of administrative and support staff of appropriate competence.</li></ul>
<b>Descriptive summary and analysis of compliance with standard requirements</b>  All the Academic and invited staff have a significant teaching experience and their qualification is in line with the TSU regulations and Georgian legislation. All are experienced in delivering courses in English and most of them were trained in San Diego State University and already deliver lectures in Tbilisi campus of San Diego State University. It should be noticed however that there is a certain degree of inhomogeneity in the scientific level, as it can be assessed by the track record of the staff. Furthermore, Organic and Physical Chemistry staff is too small in number for the attributed tasks and, the qualification of some persons in these fields is questionable. The program director has all the experience and motivation to lead the program. Indeed, he matured a relevant experience taking part to Chemistry-Biology program of San Diego State University Tbilisi Campus from its early days. He also gives lectures in chemistry department of TSU and heads a very active research group. The administrative and support staffs are of high quality and adequate in number.
<b>Evidences/indicators</b> <ul style="list-style-type: none"><li>○ During the interviews the teachers' qualifications were discussed with the Academic and Invited staffs.</li><li>○ Information reported in the staff CVs and course syllabi clearly indicated the qualification of the personnel involved in the program.</li><li>○ The qualification of the Program director clearly appeared during his interview.</li></ul>
<b>Recommendations:</b> <ul style="list-style-type: none"><li>○ The staff in Organic Chemistry and Physical Chemistry should be strengthened</li></ul>
<b>Suggestions for programme development:</b> <ul style="list-style-type: none"><li>○ The permanent staff should be increased for a better fulfillment of the ACS standard</li><li>○ The English proficiency of the recruited staff should be detailed in the hiring process</li></ul>
<b>Best Practices (if applicable):</b>

○
<b>In case of accredited programme, significant accomplishments and/or progress</b>
NOT APPLICABLE
<b>Evaluation</b>
<input type="checkbox"/> Complies with requirements <input checked="" type="checkbox"/> Substantially complies with requirements <input type="checkbox"/> Partially complies with requirements <input type="checkbox"/> Does not comply with requirements

<b>4.2 Professional development of academic, scientific and invited staff</b>
<ul style="list-style-type: none"> <li>➤ HEI conducts the evaluation of programme academic, scientific and invited staff and analysis evaluation results on a regular basis;</li> <li>➤ HEI fosters professional development of the academic, scientific and invited staff. Moreover, it fosters their scientific and research work.</li> </ul>
<b>Descriptive summary and analysis of compliance with standard requirements</b>
<p>The professional development of the staff involved in the present program is based on the standard practices of the TSU university, mainly concerning the scientific career. In particular, TSU faculty requires the submission of a report concerning the scientific activities for all the members of the Chemistry Department, which should include publications, projects, participation on conferences and other scientific activities. Other activities, such as faculty scientific conferences are also envisaged.</p> <p>For the development of the staff, there is no clear plan and budget. Possibility to participate in international programs (Erasmus+, DAAD and Fulbright) can't be directly counted as support from the university.</p>
<b>Evidences/indicators</b>
<ul style="list-style-type: none"> <li>○ The TSU procedures are clearly illustrated in the SER and were discussed during the interview with the Academic and Invited staff</li> </ul>
<b>Recommendations:</b>
<ul style="list-style-type: none"> <li>○ Specific actions for the development of the staff in the Chemistry program should be envisaged by the program Director</li> </ul>
<b>Suggestions for programme development:</b>
<ul style="list-style-type: none"> <li>○ The career development of the staff should be constantly monitored, in order to main the quality of the Chemistry Program.</li> </ul>
<b>Best Practices (if applicable):</b>

NOT APPLICABLE
<b>In case of accredited programme, significant accomplishments and/or progress</b>
NOT APPLICABLE
<b>Evaluation</b>
<input type="checkbox"/> Complies with requirements <input checked="" type="checkbox"/> Substantially complies with requirements <input type="checkbox"/> Partially complies with requirements <input type="checkbox"/> Does not comply with requirements

<b>4.3. Material Resources</b>
Programme is provided by necessary infrastructure and technical equipment required for achieving programme learning outcomes.
<b>Descriptive summary and analysis of compliance with standard requirements</b>
<p>The program will use the infrastructure, material and labs already in place for the San Diego State University program, prepared by the University within the framework of MCA compact. Furthermore, all the classrooms (Building II Library, building XI classrooms of TSU) are equipped with modern technologies. All textbooks indicated in syllabi are available at the libraries of TSU and San Diego State University.</p> <p>All these facilities and materials are well dimensioned with respect to the targeted number of students.</p>
<b>Evidences/indicators</b>
<ul style="list-style-type: none"> <li>○ The SER clearly indicated all the infrastructure and technical equipment required by the program.</li> <li>○ The availability and quality of infrastructures and equipment were confirmed during the site visit and the interview with the program director</li> </ul>
<b>Recommendations:</b>
<ul style="list-style-type: none"> <li>○ The committee has no suggestions on this part</li> </ul>
<b>Suggestions for programme development:</b>
<ul style="list-style-type: none"> <li>○ Maintining the standards of the labs and equipments will be critical for program development and attiring new students, thus there should be sustainable support from university.</li> </ul>
<b>Best Practices (if applicable):</b>
<ul style="list-style-type: none"> <li>○ The program students will have access to the best equipment and laboratories in Georgia, and arguably in the region.</li> </ul>
<b>In case of accredited programme, significant accomplishments and/or progress</b>

NOT APPLICABLE

**Evaluation**

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

**4.4. 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 programme needs.

**Descriptive summary and analysis of compliance with standard requirements**

The funds needed for the program are available through expenditure part of the faculty budget allocated by the university as well as expenses directly reflected in the expenditure section of the central budget of the university, which is also used for infrastructural improvements and development of material-technical basis. Expenditure section of the faculty budget is supposed to cover the remuneration for program personnel, the acquisition of student books, travel for staff, conference organization and student participation in educational, scientific and other events (in the presented budget draft “*travel for staff, conference organization and student participation in educational, scientific and other events*” are not included). The budget was done taking into account all these needs and the number of targeted students for the self-sustainability of the program is 24, equally shared between home and foreign students. Globally, the allocation of financial resources stipulated in program budget is adequate. However, the foreseen number of foreign students cannot be reached during the very first years of the program, so that back-up form Faculty and TSU could be necessary in a first time. Concerning the different budget items it should be noticed that no specific resources are allocated to the professional development of the staff and to the research carried out by the students during their research stages.

**Evidences/indicators**

- The program budget is clearly detailed in annex 12 of the SER
- The budget was discussed with the program director, faculty dean and the self-evaluation team.

**Recommendations:**

- A part of the budget should be allocated to the professional development of the involved staff.

**Suggestions for programme development:**

- A large awareness of the program in foreign countries will contribute to attract external students thus improving its economical self-sustainability

<ul style="list-style-type: none"> <li>○ Agreement with potential private employers for financing specific part of the program could be envisaged</li> <li>○ Program with this much potential for Georgia and region which probably can be the sole holder of ACS accreditation should receive a larger financial support from the university, especially during the first years.</li> </ul>
<p><b>Best Practices (if applicable):</b></p> <p>NOT APPLICABLE</p>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <p>NOT APPLICABLE</p>
<p><b>Evaluation</b></p> <p><input type="checkbox"/> Complies with requirements</p> <p><input checked="" type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>

### Programme's Compliance with Standard

Standard	Complies with Requirements	Substantially complies with requirements	Partially Complies with Requirements	Does not Comply with Requirements
Providing teaching resources		XX		

## 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 on a regular basis.

<p><b>5.1 Internal quality</b></p>
<p>Programme staff collaborates with internal quality assurance service(s) available at the higher education institution when planning the process of programme quality assurance, creating assessment instruments, and analysing assessment results. Programme staff utilizes quality assurance results for programme improvement.</p>
<p><b>Descriptive summary and analysis of compliance with standard requirements</b></p> <p>The Internal quality control is assured by the TSU Quality Assurance Service, which has a well-defined protocol based on: i) Accurate evaluation of the educational program following established criteria, concerning syllabi, learning outcomes, teaching methods, credits; ii) control of the stakeholders (students, academic, scientific, invited, administrative, etc..) stakeholders in the process of developing and improving the educational programs ; iii) organizing surveys among the stakeholders.</p> <p>Furthermore, the program will follow a continuous development process based on semester results of each of the courses assured by the quality assurance committee. This committee will give its feedback to the Head of the Department and the program Director.</p> <p>The whole procedure is well assessed and easily applicable to the present program, but job market research contains very general information.</p>
<p><b>Evidences/indicators</b></p> <ul style="list-style-type: none"> <li>○ The quality assurance mechanism for educational programs is described in the Annex 14 of the SER.</li> <li>○ The mechanisms already in place at TSU for assuring the program quality were discussed with the faculty quality assurance unit representatives.</li> </ul>
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>○ The committee has no recommendations on this part</li> </ul>
<p><b>Suggestions for programme development:</b></p> <ul style="list-style-type: none"> <li>○ Job market research should be performed in a more systematic way.</li> <li>○ Since the program is new, the program director should well monitor the interaction with the TSU quality committee and the program staff, in order to have an effective implementation of the feedbacks after the first year.</li> </ul>
<p><b>Best Practices (if applicable):</b></p> <ul style="list-style-type: none"> <li>○ The internal quality issues at TSU are coordinated by a dedicated service which as a very good experience on other study programs.</li> </ul>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <p>NOT APPLICABLE</p>

<p><b>Evaluation</b></p> <p><input checked="" type="checkbox"/> Complies with requirements</p> <p><input type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>
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<p><b>5.2 External quality</b></p>
<p>Programme utilizes the results of external quality assurance on a regular basis.</p>
<p><b>Descriptive summary and analysis of compliance with standard requirements</b></p> <p>As for the internal quality, TSU has an operational quality assurance system, easily accessible, which is based on “plan-implement-check-develop” cycle. This system, based on effective development and actions plans, will be completed by an Advisory Board, composed by graduates, industry representatives and academic personnel, whose role is to recommend amendments or update of the program, as appropriate. Furthermore, two external consultants, Professor William Tong and Theresa Ann Carlson from San Diego University, were involved during the preparation of the program.</p> <p>The methods and procedures for external quality control are adequate and will help in reaching the program objectives.</p> <p>There is insufficient engagement of potential employers. Interviews with employers do not show their clear involvement, mostly it is very general support.</p>
<p><b>Evidences/indicators</b></p> <ul style="list-style-type: none"> <li>○ During the interview (via Skype), professor Tong clearly indicated his involvement in the program</li> <li>○ The external quality control was discussed with the faculty quality assurance unit representatives.</li> </ul>
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>○ The committee has no recommendations on this part</li> </ul>
<p><b>Suggestions for programme development:</b></p> <ul style="list-style-type: none"> <li>○ Potential employers should have a larger involvement in the program quality control</li> <li>○ Since the program is new, the program director should well monitor the interactions with the TSU quality committee so to assure a quick reaction to the feedback from external quality control</li> </ul>
<p><b>Best Practices (if applicable):</b></p> <ul style="list-style-type: none"> <li>○</li> </ul>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <ul style="list-style-type: none"> <li>○ NOT APPLICABLE</li> </ul>

<p><b>Evaluation</b></p> <p><input checked="" type="checkbox"/> Complies with requirements</p> <p><input type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>
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<p><b>5.3. Programme monitoring and periodic review</b></p>
<p>Programme monitoring and periodic review is conducted with the involvement of academic, scientific, invited, administrative staff, students, graduates, employers and other stakeholders through systematically collecting and analysing information. Assessment results are utilized for programme improvement.</p>
<p><b>Descriptive summary and analysis of compliance with standard requirements</b></p> <p>Since the program is not yet in place the programme monitoring and period review were not yet carried out. However, the credible actions envisaged for internal and external quality control will be coupled with regular evaluations using qualitative and quantitative indicators, similar to Georgian-language program already in place. Furthermore, the quality assurance committee and self-evaluation group of the educational program will engage in monitoring process. All these actions will constitute a valid program monitoring mechanism and will assure a periodic review.</p>
<p><b>Evidences/indicators</b></p> <ul style="list-style-type: none"> <li>○ The envisaged program monitoring and periodic review were discussed with the faculty quality assurance unit representatives</li> <li>○ Director of the program well illustrated the program monitoring mechanism.</li> </ul>
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>○ The committee has no recommendations on this part</li> </ul>
<p><b>Suggestions for programme development:</b></p> <ul style="list-style-type: none"> <li>○ Since the program is new, the program director should verify that the program monitoring works correctly</li> </ul>
<p><b>Best Practices (if applicable):</b></p> <ul style="list-style-type: none"> <li>○ NOT APPLICABLE</li> </ul>
<p><b>In case of accredited programme, significant accomplishments and/or progress</b></p> <p>NOT APPLICABLE</p>

<p><b>Evaluation</b></p> <p><input checked="" type="checkbox"/> Complies with requirements</p> <p><input type="checkbox"/> Substantially complies with requirements</p> <p><input type="checkbox"/> Partially complies with requirements</p> <p><input type="checkbox"/> Does not comply with requirements</p>
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**Programme’s Compliance with Standard**

Standard	Complies with Requirements	Substantially complies with requirements	Partially Complies with Requirements	Does not Comply with Requirements
Teaching quality enhancement opportunities	XX			

**Enclosed Documentation (If Applicable)**

**HEI's Name:** Ivane Javakhishvili Tbilisi State University

**Higher Education Programme Name:** Chemistry, Bachelor Program

**Number of Pages of the Report:** 29

**Programme's Compliance with the Standard**

<b>Standard</b>	<b>Complies with Requirements</b>	<b>Substantially complies with requirements</b>	<b>Partially Complies with Requirements</b>	<b>Does not Comply with Requirements</b>
1. Programme objectives are clearly defined and achievable; they are consistent with the mission of the HEI and take into consideration labour market demands	XX			
2. Teaching methodology and organization, adequate evaluation of programme mastering		XX		
3. Student achievements and individual work with them	XX			
4. Providing teaching resources		XX		
5. Teaching quality enhancement opportunities	XX			

**Expert Panel Chair's**

**Name, last name, signature**

Prof. Carlo Adamo



**Expert Panel Members'**

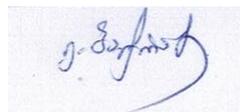
**Name, last name, signature**

Prof. Giorgi Titvinidze



**Name, last name, signature**

Dr. Elina Bakradze



**Name, last name, signature**

Mr. Aleksandre Pichkhadze

