განათლების ხარისხის განვითარების ეროვნული ცენტრი
NATIONAL CENTER FOR EDUCATIONAL QUALITY ENHANCEMENT

Accreditation Expert Group Report on Higher Education Programme

Date(s) of Evaluation:
September 28–29, 2017

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October 19, 2017

Tbilisi
2017

HEI's Information Profile

Name of Institution Indicating its Organizational Legal Form	Georgian Technical University
HEI's Identification Code	211349192
Type of Institution	University

Higher Education Programme Information Profile

Name of the Programme	Biomedical Engineering
Level of Education	PhD
Qualification Granted Indicating Qualification Code	Doctor of Engineering 04. Engineering
Language of Instruction	English
Number of Credits	180
Programme Status (Authorized/ Accredited/New)	New

Expert Panel Members

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- **General information on the education programme**

The Doctoral Programme of Biomedical Engineering is currently being developed by the Georgian Technical University. It was approved by the Academic Council of GTU on 27 February 2017.

The goal of the programme is to prepare competitive, qualified professionals and researchers for domestic and international labour markets based on research and educational courses in biomedical engineering. The awarded Qualification is Doctor of Engineering that corresponds to the National Qualification Framework.

The programme objective is to train high-level specialists in the most modern achievements in Biomedical Engineering. Educating PhD students in this field aims both to provide them with very profound knowledge and to train them to think creatively and solve novel problems. The disciplinary aims are rather extensive as they consist in: "vital systems, rehabilitation engineering, electronic health care systems (so-called HIT) technology processing, development of medical instrumentation systems, devices and software that require in-depth knowledge of innovative equipment and technology and new diagnostic procedures". Building skills to fulfil these goals is intended to be achieved through a programme that in the first year of studies contains mostly methodological and disciplinary courses, which is followed by two more research-oriented years of doctoral training.

It has to be noted that this programme is new and therefore key quantitative performance indicators are missing for an extensive evaluation.

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

After the preparation of assessment by examination of the documents provided by the Higher Education Institution, and exchanges of mails with NCEQE on the organization of the visit, the panel members met on September 28, 2017, at NCEQE offices, where they were introduced to the higher education system in Georgia and the accreditation standards and procedures. The experts then worked at preparing the next day's interviews by discussing their assessment of the written documents and preparing a list of questions to be asked during the interviews.

This was followed by a first meeting with the employers/stakeholders at the Research Institute of Clinical Medicine.

On September 29, 2017, the Panel gathered at GTU and had the following schedule:
Meeting With University Administration;
Meeting with the Self-Evaluation Team of the PhD Programme;
Meeting with faculty members;
Meeting with PhD, BSc and MSc students;
Meeting with alumni of the MSc Programme;
A tour of the institution (facilities) – library, classrooms, labs, offices;
Observing students Dissertations/Abstracts;
Meeting with PhD Supervisors;
Meeting with Programme Director, Dean, relevant Quality Assurance Staff.

The panel then had a working time to define the working plan for the evaluation report and to collect its main key findings. Those were delivered to the Administration, Program Director, Faculty Members and Self Evaluation Team.

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

This programme is built as a unique PhD programme in BioMedical Engineering in Georgia and is aimed at occupying an important and interesting niche with a significant demand. The stakeholders of

different sectors interviewed during the committee visit were all unanimous to point out a strong and urgent need for employing or mentoring students of this PhD programme.

This Doctoral programme is built in continuation with the Bachelor and Master programmes in Biomedical Engineering to fulfil the three-cycle education in the field. Such an integrated pathway usually yields highly competitive students who have got multiple experiences and have been gradually and efficiently trained in the field.

The programme is in full, or partial compliance with the majority of requirements for:

- The learning outcomes for a PhD in Biomedical Engineering
- The courses contents, which are adequate with respect to the learning outcomes
- The students' workload and ECTS distribution
- The strong demand from the labour market
- The competency and involvement of the teaching staff
- The students assessment methods , although questionable for a PhD level are in line with the regulation defined by the institution
- The availability of teaching materials: library, textbooks, online publications etc...
- The strong will for internationalization and student exchanges

Besides these positive points, the panel noted, however, several weaknesses that are listed below:

- The theoretical content of the courses is too large, reducing available time for research and personal practical work. Teaching at PhD level should be minimally knowledge-oriented but instead include problem-based teaching, personal projects, as well as exposing students to real life situations. However, such open and interactive teaching methods are not sufficiently developed
- The content of the program curriculum includes only compulsory courses, thus not giving the students sufficient options to choose between the preferable courses. This makes the content of the program limited, non-flexible and not fitted for students of different background.

- The assessment methods follow the institution's standards, but are not quite adequate for the outcomes of a PhD programme.

The programme lacks the strategy for the future development and financial sustainability. Connected with these points, the SER and other documents often give exact copies of extracts of official regulations, making it difficult to judge if the programme has developed an autonomous strategic plan.

- This situation is correlated with a lack of exposure to research during the first year of the programme.
  - The support given to the student research projects, i.e. the students' mentoring and help through the PhD is not clear. It was difficult to know whether the students will have a designated mentor for a definite research project and if they will be integrated in a research group in which they can benefit from the help of the other scientists.
  - The compliance of the laboratory equipment and facilities for this programme is also not sufficient: The SER gives a list of the infrastructure of the HEI but does not provide any specific information on the infrastructure available for this particular programme.

- Stakeholders are not sufficiently involved in the building of the programme, while they have definite needs for the students at a high level of qualification.

- No documented evidence of the cooperation or any intention of future cooperation with the foreign partners was provided, though stated at the Programme descriptive.

- There is no Quality assurance plan provided; the program does not consider any involvement of students in the Program Management, which seems to be a systematic problem of the Institution.

- The plan-do-check-act cycle is partially described in the SER but has yet to be implemented.

Summary of Recommendations

- **Provide adequate material for describing the programme**

- Make sure to provide all the documents in readable English
- No discrepancies between the regulatory documentation; no out-of-date and/or non-valid documentation;
- Apply quality assurance processes already in the building of the material
- Consider the SER as a tool for auto evaluating the strength and weaknesses of the programme: make its reaction a shared process, be sure that all the staff contributes to the contents, has read the document and has been able to comment it. Avoid vague statements.
- Prepare any future interviews by making sure that all persons meeting the experts panel have the appropriate information on the programme.

- **Develop a strategic vision that would result in specific choices to meet the main outcomes of the programme relevant to the third educational cycle.**

  - **Decrease the theoretical contents of the programme**

The teaching methods should be in line with the outcome levels of a PhD programme. Theoretical contents for courses not directly connected to Biomedical Engineering should be made as light as possible while teaching involving problem solving, real life simulation, group work and students' personal research projects in Biomedical Engineering should be enforced.

It is recommended to decrease the amount of lectures and increase interactive teaching and active learning that promotes motivated students' participation, involvement and creativity. This is particularly important for the modules aimed at providing transferable and employability skills (Scientific Communication, Research Methods, Teaching Methods).

  - **Expose students to high level research**

Students should start their research project in the fall of the first year; the course contents should be distributed more evenly over the 3 years of the programme, if possible with a flexible individual schedule.

Develop and implement a strategic plan for upgrading research facilities dedicated to this PhD programme.

Identify precisely the facilities available outside the Biomedical Engineering Department that students can use in their research work.

Secure the possibility for some Students to perform at least part of their doctorate research at the stakeholders' premises (see below)

- **Involve external partners/future employers**

Formally and concretely increase the involvement of the stakeholders outside university in different aspects of the programme:

- Learning outcomes and programme content
- SER elaboration
- Strategic steering
- Teaching
- Students training
- Research collaboration

- **Establish an effective quality assurance system for the programme**

It is both urgent and important to set up the bases for an effective quality assurance strategy that would involve the staff, stakeholders and students, with a formalized method of programme evaluation by the students.

- **Summary of Suggestions**

  - Possible training for programme accreditation at NCEQE
  - The PhD programme should contain high-level managerial and entrepreneurship courses. Those should involve teachers from the private sector and be taught in an interactive manner in order to differentiate them from already existing Master's courses.
  - The programme should take advantage of the regulation that imposes a maximum of 60 ECTS of courses for a PhD to reduce the theoretical contents of this programme, in order to ensure enough training to research by research.
  - Develop a long-term strategy to further strengthen the quality of scientific research so that students can work in as high-quality research groups as possible. Aim at high-level publications in research projects where students are involved.
  - Accept for B2 English level instead of requiring C1, as the latter limits the number of applicants, while B2 level is sufficient for understanding all the aspects of the program and holding successive communication on international level.
  - The method used in the programme to handle students of different scientific backgrounds should be explained and written with clarity.
  - Change completely the assessment method: it has to make it possible to judge the achievements of the teaching and learning outcomes by the students (which include adaptability, creative thinking....). Therefore, the students assessment should strongly engage these aspects. Many possibilities exist (problem based assessment, personal project, group work, real life simulations, case studies...) and the panel leaves it to the programme to elaborate adapted assessment along these lines. The assessment methodology should be clear and objective.
  - Employability of the graduates should be enhanced by specific management and entrepreneurship trainings and courses aimed at graduate student level.

- **Summary of best practices (If Applicable)**

- **In case of accredited programme, summary of significant accomplishments and/or progress (If Applicable)**

Not Applicable

Compliance of the Programme with Accreditation Standards

1. Educational programme objectives, learning outcomes and their compliance with the programme

1.1 Programme objectives are clearly defined and achievable; they are consistent with the mission of the HEI and take into consideration labour market demands
Descriptive summary and analysis of compliance with standard requirements ○ The programme objective is to train high-level specialists in the most modern achievements in Biomedical Engineering. Educating PhD students in this field aims both to provide them with specialized knowledge and to train them to think creatively and solve novel problems. The disciplinary aims are rather extensive as they consist in: "vital systems, rehabilitation engineering, electronic health care systems (so-called HIT) technology processing, development of medical instrumentation systems, devices and software that requires in-depth knowledge of innovative equipment and technology and new diagnostic procedures". Building skills to fulfil these goals is intended to be achieved through a programme that in the first year contains mostly methodological and disciplinary courses, followed by two more research-oriented years of doctoral training. ○ The programme has been built to fulfil the standard requirements in terms of student workload and ECTS. It also takes the labour demand market into account as the need for high-level specialists in Biomedical Engineering is in expansion in Georgia and elsewhere. As it will be further explained all along this evaluating document, the main objectives are partially achievable, because this programme is not fully thought at a PhD level. In particular the content of theoretical courses is too high, the amount of interactivity and personal projects is too low and the exposure to high-level research is not yet fully enforced. Taken together, while standard requirement are fulfilled, the contents and methods applied within this programme will not fully enable to train students at the high levels of autonomy, creativity and specialisation required for a PhD.
Evidences/indicators ○ The Self Evaluation Report (SER) ○ The course Syllabi ○ The programme depiction ○ National qualification framework ○ Accreditation Standards ○ Other documents and guidelines (NQF directions, Credit hour calculation...)

- Programme website
- Facilities visit (laboratories, library, classrooms).
- CVs of the programme Staff (in Georgian but publications provided the day of the visit)
- The interview with: Rector, persons in charge of the programme, of the quality assurance management, teachers, students, employers/stakeholders etc...

It has to be noted that this is a new programme and therefore key quantitative performance indicators are missing for an extensive evaluation. Furthermore, the clarity of the SER and additional documents was not fully satisfying. In particular, several sections were too vague and general, while others were crowded with detail that made it difficult to identify strategic aims. In addition, CVs, websites and several other PDF documents were in Georgian and could not be understood by the foreign experts, while the Georgian experts found them in some cases not sufficient (for example, the proposed CVs do not give the information on professional qualification of academic staff involved in the program delivery) or not in correspondence with the English version. Taken together, it was sometimes difficult to extract precise information from the written documents. On the other hand, the persons met during the interviews were very open, enthusiastic and cooperative and provided the panel with a large amount of relevant information.

Recommendations:

- The highest priority when building such a programme is to first align the ambitious outcomes required for PhD level with the research environment (in public and private institutions), and with the teaching contents, and methods.

Suggestions for programme development:

-

Best Practices (if applicable):

- Practices which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

Does not comply with requirements

1.2 The content of a programme component (a course, a module, etc.) ensures the achievement of the objectives and student learning outcomes of the component, considering the number of credit hours allocated for it and teaching methods utilized

Descriptive summary and analysis of compliance with standard requirements

- A detailed examination of the various documents and of the information gathered through the interviews shows that the course content is adequate with respect to the learning outcomes: those contain both methodological modules: Scientific Communication Methods, Research Methods of Biomedical Engineering and Teaching Methods as well as specialized modules: Biomedical Sensors, Control Systems in Medicine, Medical Analysis. All these modules are pertaining to the field of Biomedical Engineering.

  However, the contents given in the course syllabi raise important questions concerning the equilibrium between practical and theoretical training within the present programme. Indeed, the theoretical contents are too large, reducing available time for research work, and/or too detailed and may even appear overambitious. This is especially the case for the "Scientific communication techniques" and "Teaching methods" modules which content is overwhelmingly broad and would take a whole programme to be extensively taught so as to reach desired learning outcomes as described. Although it can be acknowledged that a broad culture is an asset, it may not be necessary to train PhD students in Biomedical Engineering as specialists of the theories of communication and education, rather than improve their practical skills in those areas. To summarize, those learning outcomes appear too far-reaching and unlikely to be achieved in this configuration.

- Furthermore, the teaching methods are not fully matching the outcome levels of a PhD programme. Theoretical contents are too heavy for Scientific Communication, Research Methods and Teaching methods, while the titles and contents of the practical parts (entitled Seminars or Practical Classes) are extremely similar to the previous lecture section. Moreover, the panel could not find information on "professor assistance" in the syllabi of those programme modules, which according to the HEI internal regulation is a compulsory part of the Doctoral programme awarded with credits. Similarly, the objectives of the course "Medical Image Analysis" are "to give new knowledge about modern imaging methods involve sophisticated instrumentation and equipment using high-speed electronics and computers for data collection and image reconstruction and display". However, the course format does not leave enough space for practical experience as it is built on 60 hours of lectures and 30 hours of practical courses.

Taken together, the described modules are too theoretical and open and interactive teaching methods are missing.

- This situation is correlated with the lack of exposure to research, mainly during the first year of the programme, when the students only follow theoretical courses. This is particularly problematic, as the students are therefore not in contact with laboratories, companies and institutes. This distracts them from the benefit of learning from research. With respect to this point, the committee's visit in the laboratories showed materials and projects that were more relevant to Master's than to PhD levels. It was stated during the visit that more appropriate facilities were present on other sites on the campus or on clinics However, in the absence of a clear depiction of these facilities and on the modalities of their utilization in the documents provided to the panel, the mention of their existence is not an indicator that the students are exposed to the best possible research in the field.

- The content of the program includes only compulsory courses; this makes the content of the

program limited and non-flexible. This is an important problem for two main reasons: (i) At PhD level, students are expected to be actors in their own training by choosing elective courses that will enable them to fulfill their professional project and (ii) because applicants in this programme are expected to come from different backgrounds and will need different courses to reach the programme learning outcomes.

- The documents provided to the expert panel contain mistakes in the distribution of credits among semesters as well as in calculations of contact and independent working hours within the educational courses and research components, that makes it difficult to evaluate, if the Programme structure is relevant to the requirements for the third cycle of education.

Evidences/indicators

- The Self Evaluation Report (SER)
- The BLE PhD Program Document
- The course Syllabi
- National qualification framework
- Accreditation Standards
- Other documents and guidelines (NQF directions, Credit hour calculation...)
- Programme website
- CVs of the programme Staff (in Georgian but publications provided the day of the visit)
- The interview with: the Rector, the head of the Department of Authorization and Accreditation and the head of the programme, head of the quality assurance management, teachers, students, employers/stakeholders etc...
- Facilities visit (laboratories, library, classrooms)

Recommendations:

- Students should start their research project in the fall of year one; the course contents should be distributed more evenly over the 3 years of the programme, if possible with a flexible individual schedule.
- The teaching methods should be revised according to the outcome levels of a PhD programme. Theoretical contents for courses not directly connected to Biomedical Engineering should be made as light as possible while teaching involving problem solving, real life simulation, group work and students' personal research projects in Biomedical Engineering should be enforced.

Suggestions for programme development:

- This PhD programme should contain high-level managerial and entrepreneurship courses. Those should involve teachers from the private sector and be taught in an interactive manner in order to differentiate them from already existing Master's courses.
- The course contents should be significantly reduced below 60 ECTS in order to ensure more practical training as well as training to research by research.
- Teaching assistance should be credited with its special credits and not as a part of a course.

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (if

Applicable)

Evaluation

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

Complies with requirements

☑ Partially complies with requirements

Does not comply with requirements

1.3 Programme components ensure the achievement of programme objectives and student learning outcomes of the appropriate level of qualification in the National Qualifications Framework

Descriptive summary and analysis of compliance with standard requirements

- The Programme components are described in detail in the "BME PhD Program" document provided in English to the experts. This document includes the inventory of the programme aims and prerequisites, followed by a programme description, which is somewhat difficult to follow on the document. It consists in:

- A first semester that includes the methodological modules (15 credits) and a program-related Special course for 10 credits, that means 25 ECTS overall instead of stated 30 ECTS. It is noteworthy that the Georgian version of the document provides different information.

- The second semester continues with specialized courses (10 credits each) and then, following midterm assessments, the students start to prepare their doctoral dissertation by preparing a research prospectus (15 credits) and a seminar on their topic (15 credits).

- The second and third years are dedicated to the theoretical and experimental parts of the PhD research, for 60 credits each.To complete their PhD, the students will have to prepare at least three Colloquia and have published at least three research articles. They will also have to take part in at least one conference and have to publicly defend their work.

- The SER gave also a depiction of the outcomes, which exhaustively correspond to general standards requirements according to the Dublin Descriptor for a PhD programme. The main headlines for those contents are: "Knowledge and understanding; Ability to use knowledge in practice; Skills in drawing conclusion; Communication skills; Ability to learn; Ethics/values". It has to be noticed that such an enumerative depiction does not allow to understand how these very numerous topics were prioritized and what is the strategic plan that will be used to reach them. It was also not possible to obtain accurate answers on this point during the interviews. This indicates that a better strategic thinking might be relevant to improve the readability of the programme.

Evidences/indicators

- The Self Evaluation Report (SER)
- The BLE PhD Program Document
- The course Syllabi
- National qualification framework

- Accreditation Standards
- Other documents and guidelines (NQF directions, Credit hour calculation...)
- Programme website

NB: The BME PhD Programme document gives access to the webpage describing the Regulation of the University for PhD dissertation, and to PDF documents, which are written in Georgian. This makes it impossible for the foreign experts to use them in order to assess the compliance with standard requirements. Furthermore, the Georgian experts found contradictions in the Regulatory documents (especially regarding the assessment of the program components).

Recommendations:

Develop a strategic vision that would result in specific choices to meet the main outcomes of the programme. Typically, this has to result in more research-orientated teaching, both for the choice of topics and for the choice of adapted teaching methods. This process should be built through a collective reflexion that also has to include the teachers, the stakeholders and to receive the feedback from the students.
See earlier recommendation on the documents provided to the experts.

Suggestions for programme development:

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

Complies with requirements

☑ Partially complies with requirements

Does not comply with requirements

1.4 Programme learning outcomes ensure the competitiveness of its graduates on educational (at the next level of education) and labour markets

Descriptive summary and analysis of compliance with standard requirements

- This programme is built as a unique PhD programme in Georgia and is aimed at occupying an important and interesting niche.
- The stakeholders of different sectors (Radiation Oncology, Health Management, private sectors) interviewed by the panel were all unanimous to point out a strong and urgent need for employing students with a background in Biomedical Engineering, including several of them with a PhD degree.
- This programme is built in continuation with the Bachelor and Master programmes in Biomedical Engineering. Such an integrated pathway usually yields highly competitive students who have got multiple experiences and have been gradually and efficiently trained in the field.

- Besides these positive aspects, several built in weaknesses distract this program from reaching its full competitiveness:
- Stakeholders are not sufficiently involved in the building of the programme, while they have definite needs for the students at a high level of qualification.
- The interviewed students unanimously asked for laboratory improvements (modern materials, devices and equipment).
- No evidence of solid benchmarking for the programme by comparison with similar programmes led by other universities.
- No documented evidence of the cooperation or any intention of future cooperation with the foreign partners as declared in the program descriptive. The provided MoU is out of date.

Evidences/indicators

- The interview with the stakeholders and the students, which confirmed the conclusions raised from the analysis of the SER and other documents

Recommendations:

Formally and concretely increase the involvement of the stakeholders outside university in different aspects of the programme:
- Strategic steering
- Teaching
- Students training
- Research collaboration
-Accreditation preparation

Develop and post a strategy for the improvement of laboratory equipment.

Suggestions for programme development:

Develop a strategy to further strengthen the quality of scientific research at the university so that students can work in as high-quality research groups as possible. Aim at high-level publications in the research projects where students are involved.

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

☐ Does not comply with requirements

1.5. The mechanism of stakeholders' (employers, academic staff, students, graduates) participation in the establishment of programme learning outcomes and programme development, is established and implemented

Descriptive summary and analysis of compliance with standard requirements

- The SER did not present any solid evidence that external stakeholders had been taking part of the building of the programme. Neither was it mentioned that they were involved in its monitoring and evolution. The interviewed stakeholders indicated that they knew the programme and were fully supportive of it but also confirmed that they did not take an active part in it, despite some informal consultations.
- This lack of stakeholders' involvement also detracts them from easily hiring students in their companies or hospitals for the PhD research projects.

Evidences/indicators

SER analysis, interviews with external stakeholders, interviews with programme director, students and staff. In all these, the panel could not find evidence of:

- Stakeholders' consultation in building the programme, reading the SER...
- Stakeholders' involvement in the quality assurance process of the programme
- Stakeholders' significantly teaching in modules
- Planned PhD research in private companies or similar structures (hospital...).

Recommendations:

Formally and concretely involve the stakeholders in different aspects of the programme:
- Strategic steering
- Teaching
- Students training
- Research collaboration

Some students should be able to perform at least part of their doctoral research at the stakeholders' premises

Suggestions for programme development:

Non-binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

Does not comply with requirements

Programme's Compliance with Standard

Standard	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

2.1. Programme admission preconditions are transparent and ensure the admission of students of relevant knowledge, skills and values necessary to master programme learning outcomes

Descriptive summary and analysis of compliance with standard requirements

The close examination of the SER and different documents as well as the interview of the students clearly showed that the modalities and preconditions of recruitment are transparent and fair and that the students have a sufficient knowledge of the process. The admission rules follow the governmental rules and are made public from the website of the faculty.

Promoting a good English level is commendable, but the panel felt that the prerequisite to have the C1 English level might not be fully necessary as the B2 level should be sufficient for understanding the scientific literature and for communication. Asking for a too elevated level in English may also lead to not recruiting students who would have a largely good enough scientific level for the programme but would fall below a C1 level.

Evidences/indicators

SER analysis, Programme depiction, Courses Syllabi
Interview with the students and responsible persons of the programme

Recommendations:

Suggestions for programme development:

Accept for B2 English level instead of requiring C1

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

☑ Complies with requirements

Partially complies with requirements

Does not comply with requirements

2.2 Teaching methods utilized in various components of the programme ensure the achievement of programme learning outcomes

Descriptive summary and analysis of compliance with standard requirements

- The analyses of the different syllabi, of sections of the SER and Programme depiction show that a large majority of contact hours are taught as lectures. In some cases (teaching, communication, scientific methods), the seminars or practical classes appear like direct extensions of these lectures, with no obvious differences in the contents and methods.
- This was confirmed by the interview with the teaching staff.
- This is not the most appropriate way to achieve learning outcomes at PhD levels. Indeed, as cited in the SER, one of the main intended outcomes is to produce adaptable students who are able to solve novel problems, perform in unpredictable circumstances and think in a creative manner. Consequently, teaching at the PhD level should be minimally knowledge oriented but instead include problem-based teaching, personal projects, as well as exposing students to real life situations.

Evidences/indicators

- The Self Evaluation Report (SER)
- The courses' Syllabi
- The interview with: the person in charge of the programme, teachers, students

Recommendations:

Decrease the amount of lectures and increase interactive teaching that promotes students' participation, involvement and creativity. This is particularly important for the modules aimed at providing transverse and employability skills (Scientific communication, Research Methods, Teaching Methods).

Suggestions for programme development:

Non binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

Complies with requirements

☑ Partially complies with requirements

Does not comply with requirements

2.3 The sequence and admission preconditions of programme components are logical

Descriptive summary and analysis of compliance with standard requirements

The sequence is extremely logical for the students who have undergone the Bachelor and Master programmes in Biomedical Engineering and who enter the following PhD after having mastered all the basics. As previously mentioned, this inherent logic is strength of the programme, by completing all three cycles of education in the field. However, the situation might be more problematic for students of different backgrounds, who are eligible to be enrolled in the PhD programme. As those students will come from specialized Masters programs in Physics, Chemistry, Medicine etc., those will need to be updated in different fields where they are lacking the appropriate knowledge. The interview with teachers indicated that this would be done on an individual basis. However, the panel could not assess more precisely how this would be practically achieved. Connected to this point, one central question is how many students from different backgrounds are expected in the programme. Taken together, these two points deserve further clarification, as welcoming students from different backgrounds in a multidisciplinary programme is an opportunity but also a challenge.

Evidences/indicators

- SER
- Programme depiction
- Interview with the teachers

Recommendations:

The method used in the programme to handle students of different scientific backgrounds should be explained and written with clarity

Suggestions for programme development:

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

Does not comply with requirements

2.4 The evaluation methods of each programme component ensures the achievement of student learning outcomes of this component, which is proved by evaluation results

Descriptive summary and analysis of compliance with standard requirements

- The Syllabi depict the same assessment methods that appear to be a copy-paste of legal standard methods for assessment. The text is ambiguous as it refers both to a panel of assessment methods that are: Testing, Written exam; Individual/group project presentation; Oral exam; Observation.
- but then it states that the main exams will be conducted using multiple choice questions as well as closed-ended (yes/no) questions whose answers have to be held in a written form. The latter assessment methods have been confirmed during the interviews with the staff and with the students, who also mentioned exams taken on computers.
- Although it might be fully in line with official requirements, such methods are not adapted to assess the learning outcomes of students at PhD level, who, as stated before, need to learn to be adaptable and creative thinkers. This latter point is also correlated with the problems found in the teaching methods, as described in a previous section of this report. Hence both teaching and assessment need to be deeply rethought.

Evidences/indicators

- Syllabi of courses, interviews with teaching staff, students...

Recommendations:

Completely revise the evaluation method: it has to make it possible to judge the achievements of the teaching outcomes by the students (which include adaptability, creative thinking....). Therefore, the student assessment should strongly engage these aspects. Many possibilities exist (problem-based learning, personal project, group work, real life simulations...); the panel leaves it to the programme to elaborate adapted assessment along these lines.

Suggestions for programme development:
Best Practices (if applicable): o Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes
In case of accredited programme, significant accomplishments and/or progress o Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)
Evaluation o Please, mark the checkbox which mostly describes your position related to the programmes compliance with this specific component of the standard Complies with requirements ☑ Partially complies with requirements Does not comply with requirements

2.5 Student evaluation criteria are transparent; students are informed about the achievement of learning outcomes, their gaps and ways for improvement
Descriptive summary and analysis of compliance with standard requirements o The evaluation is transparent, fully available on the University website. Interviewed students (who are not yet in this PhD programme but in Bachelor's, Master's or close to PhD student's levels) are well aware of the evaluation criteria. The panel therefore infers that transparent evaluation is a part of the common culture of GTU and that it will be in action as well in this novel PhD program. o However, as stated before, the problem here is not the transparency but the inadequacy of the assessment methods for a PhD level.
Evidences/indicators o SER o Courses Syllabi o Interview with the students
Recommendations: Proposal(s), which should be considered by the institution to comply with requirements of the standards

Suggestions for programme development:
Non-binding suggestions for programme development
Best Practices (if applicable):
○ Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes
In case of accredited programme, significant accomplishments and/or progress
○ Significant accomplishment and/or progress made by the programme after previous accreditation (If 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 Partially complies with requirements Does not comply with requirements

Programme's Compliance with Standard

Standard	Complies with Requirements	Partially Complies with Requirements	Does not Comply with Requirements
Teaching methodology and organization, adequate evaluation of programme mastering		X	

3. Student achievements and individual work with them

3.1 Students receive appropriate consultations and support regarding the determination of their profile, planning of learning process and improvement of their academic achievement
Descriptive summary and analysis of compliance with standard requirements The SER clearly states that the students will receive permanent support from an academic supervisor as well as consulting and supporting from teachers on specific subjects. This information was also given during the interviews with both staff and students. Especially the staff appeared motivated and close to the students, while the students unanimously appreciated the support provided by their professors. Finally, during the lab visits, the students (Master's level) were happy to show their experiments and appeared to have excellent relations with their mentors.

- At PhD level, however, the important question concerns the support given to the student research projects, i.e. the students' mentoring and help through the PhD studies. Here it was not clear whether the students will have a designated mentor for a definite research project and if they will be integrated in a research group in which they can benefit from the help of the other scientists. This question reflects on the more general problem that has already been mentioned concerning the ill-defined place given to research in this PhD programme.

Evidences/indicators

SER
Interviews with staff and students
Lab visit and research presentation by students.

Recommendations:

Student participation in high-level research or development projects should be facilitated and encouraged

Suggestions for programme development:

Best Practices (if applicable):

- Practices which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

Complies with requirements

☑ Partially complies with requirements

Does not comply with requirements

3.2 Academic staff workload scheme includes individual work with students

Descriptive summary and analysis of compliance with standard requirements

- In this section, the SER gives a very deceptively short answer, which summarizes as: "Consultation schedules with students of the academic personnel will be placed on the relevant board of information departments."
This lets the panel infer that there is an allotted time for the staff to work individually with the

students. However, the information is not sufficient here. Firstly quantitative information is lacking: how many hours? How many times per semester or per year? Also qualitative information is missing: which support will be given to the students (research? courses? career advice? etc...). Is administrative staff involved?

Evidences/indicators

- Reading of the SER and courses syllabi
- Interview with the students and the staff

Recommendations:

Again clarify the distinction between the teaching and research mentoring that is a major component at a PhD level.

Suggestions for programme development:

Non binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

Does not comply with requirements

3.3 The institution supports students' involvement in research projects and extra-curricular activities, and also offers them components developing practical skills

Descriptive summary and analysis of compliance with standard requirements

- Here the SER explains how the institution will support the students' research projects by giving a list of international agreements and by listing three projects funded by GTU (one of them being 7 years old) and without giving any further explanation. Even after the interviews, the panel was not sure to understand whether the programme project was lacking internal research, or if question 3.3 had not been fully understood while filling the SER.

- The interviews revealed that student involvement in research starts by the students choosing their own project; and that "3 or 5 researchers could train the students in different fields". It was also mentioned that the programme had agreements with other entities and institutions. Those agreements were expected to be activated (or renewed for those which had expired) after the accreditation. It was not fully clear however what the practical support could be, given by the institution to a large diversity of subjects.

- It is hard to evaluate the extracurricular activities of the students as (i) this is not the essential part of the Programme (ii) the programme has not been launched yet.

Evidences/indicators

- SER, Interviews.

Recommendations:

As stated in its name, a Self Evaluation Report reflects the ability of the staff in charge of the programme to auto-evaluate its different aspects. The lack of clarity of this point indicates that the persons responsible of the programme should better evaluate the possibilities the programme can offer to support the students. This should enable them to better propose solutions for programme improvement.

Suggestions for programme development:

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

Complies with requirements

☑ Partially complies with requirements

Does not comply with requirements

3.4 The institution aims to internationalise its teaching and scientific work as well as the employability of its graduates

Descriptive summary and analysis of compliance with standard requirements

- The institution is dynamic concerning internationalization: Both the SER and interview showed a strong will of the University to develop international collaborations. Hence the SER states that the programme has an important collaboration with University of Alabama in Birmingham (USA), with whom a memorandum of understanding (MoU) has been signed. In addition, it is part of a currently-running Erasmus project with Western Pomeranian Technological University (Poland) and Patras University (Greece), the "Ulrich Research Center of the Federal Republic of Germany" (for which no city or precise location is mentioned). The SER also states a 2013 Tempus project.
- Those are positive points, but it is nevertheless difficult to understand exactly which exchange programme is active, what GTU intends to achieve within these agreements, how and for how many students. In particular, it appeared to the panel that the MoU with the University of Alabama at Birmingham has been reaching its end and is not active and needs to be renewed before definite actions can be taken.

Taken together, The SER and staff have to be more accurate on how those exchanges will be used, especially if it mentions their importance.

Evidences/indicators

- SER examination, Interviews with the staff. Interviews with the students.

Recommendations:

Proposal(s), which should be considered by the institution to comply with requirements of the standards

Suggestions for programme development:

Employability of the graduates should be enhanced by specific management and entrepreneurship trainings and courses aimed at graduate student level.

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

Does not comply with requirements

Programme's Compliance with Standard

Standard	Complies with Requirements	Partially Complies with Requirements	Does not Comply with Requirements
Student achievements and individual work with them		X	

4. Providing teaching resources

4.1 The infrastructure and technical equipment of the institution ensures the achievement of programme learning outcomes

Descriptive summary and analysis of compliance with standard requirements

- The SER gives a list of the infrastructure of the HEI but does not provide any specific information on the infrastructure available for this programme.
- Interview with the staff did not yield any evidence that the students are going to perform their PhD in established research groups where they would benefit from research infrastructures that would comply with the requirements for their research.
- The visit to the facilities revealed that the library was fulfilling the needs for basic literature at PhD level while the visits to the laboratories did not show evidence of materials and equipment adapted to high-level research required for PhD studies.

While it cannot be excluded that during its allotted time, the committee may not have visited all relevant research infrastructures, the lack of research materials was confirmed by the interviews with the students who insisted on the necessity of expanding and rejuvenating the equipment dedicated to this programme.

Evidences/indicators

- SER, visit of the infrastructures, interviews with the students and staff

- Component evidences/indicators including relevant documents and interview results

Recommendations:

Develop and implement a strategic plan for upgrading research facilities dedicated to this PhD programme. Identify precisely the facilities available outside the Biomedical Engineering Department that students can use in their research work.

Suggestions for programme development:

Non-binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

Complies with requirements

☑ Partially complies with requirements

Does not comply with requirements

4.2 Programme staff has necessary competences required for the achievement of intended learning outcomes of the component they teach, which is proved by-in case of academic staff- scientific papers written during the past 10 years (in arts field- creative projects) proving staff's competence in the relevant field; in case of invited staff -may be certified by practical experience

Descriptive summary and analysis of compliance with standard requirements

The SER Information is very scarce and here again CVs are in Georgian, while the link provided in the SER for the publications also points towards Georgian web page. Therefore it is not easy to access for foreign experts. Furthermore, when translated, the lists of publications were exhaustive and for all faculty members, making it impossible to find the list of publications for a specific member of the faculty. Furthermore, a large part of scientific papers were published in Georgian journals whose international visibility is difficult to assess.

- The Georgian experts found the provided CVs not sufficient for evaluating the competencies of academic staff involved in the programme, as majority of external links indicated in CVs appeared non-available, there were lack of information on staff education, achievements, and publications.

- Fortunately, the interviews with the teachers and students gave an excellent impression on the teachers' abilities, qualification and motivation.

Evidences/indicators

- SER, teachers' CVs, Website, interviews with the teachers and students.

Recommendations:

Make sure to provide all the documents in readable English when the programmes have to be examined by an international panel.

Suggestions for programme development:

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

☑ Complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

4.3 Programme implementation is ensured by the administrative and support staff of an appropriate competence

Descriptive summary and analysis of compliance with standard requirements

- Also this point is difficult to assess in detail, as the SER does not give sufficient information. Slightly more information was provided from the interviews with the staff where the administration was described to provide significant support for the organization of events such as conferences, and being relatively transparent for day-to-day life. The discussions with the students did not reveal any

problematic situation related to the administrative support and staff.

Evidences/indicators

- Interviews, SER

Recommendations:

- Proposal(s), which should be considered by the institution to comply with requirements of the standards

Suggestions for programme development:

Non-binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

☑ Complies with requirements

Partially complies with requirements

Does not comply with requirements

4.4 Teaching materials are based on the core achievements in the field and ensure the achievement of intended learning outcomes

- **Descriptive summary and analysis of compliance with standard requirements** The library appeared to be well-equipped and to offer suitable books in English and access to the latest publications. This was confirmed by the students who explained that they had very good access to excellent books in their study domain.
- The visit to the Biomedical Engineering Department showed different equipment and material that were more appropriate for Bachelor's and Master's levels. This is, however, pertaining more to the research aspects of the PhD programme (see above).

Evidences/indicators

- Visit to the library classrooms and laboratories.
- Interviews with the students.

Recommendations:

Proposal(s), which should be considered by the institution to comply with requirements of the standards

Suggestions for programme development:

Non-binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

☑ Complies with requirements

Partially complies with requirements

Does not comply with requirements

4.5 Programme is financially sustainable

Descriptive summary and analysis of compliance with standard requirements

- This is a complex question that has been addressed at different levels through the interviews as information is nearly non-existent in the SER and additional documents. The panel was told by the rector that the Faculties had their own budgets and decided how to fund their programmes, while multidisciplinary programmes could get supported by special funding from the University. Multidisciplinary programmes would also receive funding from different faculties involved as a percentage of their participation. The students' tuition fees cannot support the programme by themselves.
- Taken together, the structure of the programme (interdisciplinarity, large fraction of time passed in research, small number of students...) and the above-mentioned information seem to warrant its financial sustainability. The panel could, however, assess this question only with a large uncertainty, as the different documents and interviews did not yield quantitative data on the financial sustainability of the programme and no clear financial sustainability plan was presented.

Evidences/indicators

- No clear evidences despite questions, that always yielded general answers.
-

Recommendations:

Proposal(s), which should be considered by the institution to comply with requirements of the standards

Suggestions for programme development:

Non-binding suggestions for programme development

Best Practices (if applicable):

- Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If 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

☑ Partially complies with requirements

Does not comply with requirements

Standard	Complies with Requirements	Partially Complies with Requirements	Does not Comply with Requirements
Providing teaching resources		X	

5. Teaching quality enhancement opportunities

5.1 There is a publicly available quality assurance system which is based on the "Plan-Do-Check-Act" cycle
Descriptive summary and analysis of compliance with standard requirements ○ The plan-do-check-act cycle is described in the SER but this appears mostly rhetorical at this step and has yet to be implemented. It has to be noticed that it is difficult to evaluate quality assurance from a programme that is only at its beginning. However, the panel felt that here, the absence of data was connected clearly to a cultural feature on this matter. In particular, from the SER and interviews, it was not possible to obtain replies on: What key performance indicators will be used to monitor the programme? Why is there no evaluation of the programme by the students? What are the pathways of information within the programme? ○ Are there some committees or persons charged to gather data, propose actions? Implement actions? ○ What is the Managerial Board of the Programme if any? ○ In this context, who has the prerogatives and responsibilities to do what? This impression was reinforced by the discrepancies found in the Program, the Self Evaluation Report and the accompanying documentation, indicating that quality assurance processes were not fully operating at the elaboration and accreditation steps of the programme.
Evidences/indicators SER, interview with Staff, Head of the programme and Head of the Department of Authorization and Accreditation. Students.
Recommendations: It is both urgent and important to set up the bases for an effective quality assurance strategy that would involve the staff, stakeholders and students, with a formalized method of programme evaluation by the students.
Suggestions for programme development: Non-binding suggestions for programme development
Best Practices (if applicable): o Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes

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

- Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)

Evaluation

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

☐ Complies with requirements

☐ Partially complies with requirements

☑ Does not comply with requirements

5.2 Internal and external quality assurance results are utilized to improve the achievement of programme learning outcomes

Descriptive summary and analysis of compliance with standard requirements

- It is not possible to reply to this question as this stage for two main reasons;
- Firstly the programme is new and it is therefore difficult to assess how the quality assurance results can be used
- Secondly as earlier mentioned, the presentation of the programme and interview did not provide sufficient information to evaluate how the results will be utilized.

Evidences/indicators

- No satisfactory indicators

Recommendations:

Make sure to provide all the documents in readable English when the programmes have to be examined by an international panel

Suggestions for programme development:

- It might be important to train the staff members, especially when in charge of a programme, to properly write the different evaluation documents. Maybe this could be achieved through training sessions organized by NCEQE.

SER writing should be as collective as possible. This would relieve some burden on the responsible of the programme and help making the SER more complete. This would also help to reduce the inaccuracies

Best Practices (if applicable):

o Practices, which prove to be exceptionally effective and which may become a benchmark or a model for other higher education programmes
In case of accredited programme, significant accomplishments and/or progress Significant accomplishment and/or progress made by the programme after previous accreditation (If Applicable)
Evaluation o Please mark the checkbox which mostly describes your position related to the programmes compliance with this specific component of the standard Complies with requirements Partially complies with requirements Does not comply with requirements ☑ Not possible to evaluate

Programme's Compliance with Standard

Standard	Complies with Requirements	Partially Complies with Requirements	Does not Comply with Requirements
Teaching quality enhancement opportunities			X

Enclosed Documentation (If Applicable)

HEI's Name: Georgian Technical University

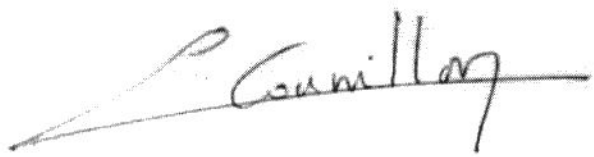
Higher Education Programme Name: Biomedical Engineering

Number of Pages of the Report: 32

Programme's Compliance with the Standard

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

Expert Panel Chair's Signature:



HEI's Name: Georgian Technical University

Higher Education Programme Name: Biomedical Engineering

Number of Pages of the Report: 32

Programme's Compliance with the Standard

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

Expert Panel Member's Signature:

Risto Ilm

Tatyana Tretyakova

Tsitsino Turkadze

Elena Cherkezia

"Reason Based Arguments on Accreditation Expert Group Report on Higher Education

PhD Programme in Biomedical Engineering"

Comments from the Expert Panel

The comments follow the order in which the arguments are presented. We did not modify our evaluation from the material provided after the date of the visit. Overall we tend to think that our evaluation already had positive effects as it pushed the institution to write, collect and send these documents, which pertain to weaknesses found during the evaluation.

Standard 5.

Attachments 1 (GTU Charter and Statutes) and 2 (Provisions of Doctorate Study) cannot serve as main indicators for 5.1. standard.

1. The KPIs presented in the table look fine (though detailed description is missing), but there was no mention of them in the SER. This is confirmed by the date present on the document, which is after the visit took place (11.2017).
2. The Attachment 3 represents the questionnaire for the students, and the SER names *"Assessment questionnaires developed by the University Quality Assurance Service"* as one of the indicators for the standard 5.1. Though the interviews with the students of BSc and MSc programmes and alumni revealed that there were not aware of such working mechanisms for students' feedback. The Attachment 3 is not "the evaluation of programs by the students" as stated in argumentative position, but is actually "the form for evaluating lecturers".
3. The Attachment 4 "hasn't come to the attention of expert panel" as it has never been presented. The questionnaires in Georgian (ATCH 3) and in English (ATCH 4) do not match. Furthermore ACTH-3 is in Georgian and cannot be used by international English-language students.
4. The "Committee of Support for Developing of BME study" is nowhere mentioned in the SER (neither in descriptive part, nor as indicator), as well as never been mentioned at any of the interviews held. Though four partners *supporting the implementation of the program (• LLC Ivermidi;• Central University Clinic after Academician N. Khipshidze;• Chapidze Heart Center - Georgian German Hospital• Alabama University of Birmingham (USA))* are mentioned in the context of supporting the implementation of the programme (see SER).

The interview with students showed that they are not involved in any kind of QA activities, neither through the membership and participation in committees or boards, nor through filling the questionnaires.

5. The scheme of managerial Board, mentioned for the first time in the Reason Based Arguments, is not fully clear. It is envisaged within the whole administrative and academic structure of the university, rather than regarding and taking into account the specificities of the particular programme.
6. Although the committee is well aware that it is not possible to fully examine a quality assurance process for a new programme (as mentioned in the report), its main remarks concerned the insufficiency of the processes of quality assurance used *to build the programme* and

communicate adequate information through the documentation provided to the evaluators *before the visit.*

Other standards:

1. "Equilibrum between theoretical and practical training" is not properly understood by the program leaders. Though, in any case, the credit distribution (see programme structure) corresponds to the regulations, we have this point as a suggestion instead of a recommendation.
2. "Assistance in Programme Modules " – this is the requirement of GTU regulations for Doctoral programmes, the professor assistance should be credited with special credits and not as a part of a course. Within this component the students not only "conduct observations on pedagogical activities of the academic staff", but have to conduct some pedagogical activities (e.g. leading seminars or practical classes") themselves. "Professor assistance" is not a position, but the component of doctoral study.
3. "Contact with companies and laboratories" - here the argumented position contains several inaccuracies. First, all the documents which were sent to the expert panel, were carefully studied; the experts even made additional investigations by getting acquainted with the documents available from the GTU web-site. This means that the additional documents presented in Attachments 5, 6, 7 "were left unseen" not because "of the tight schedule", but because they were simply not included to the package. As the "hosts" explained, the labs mentioned in this reply were not visited as "there was no possibility" at the time to do so. According to the documents sent within the packages, the laboratories are quite well-equipped, but the question remains whether and how these labs will be available for the students of PhD programme.
4. "Distribution of credits" – the argument of "technical error" can be accepted, though the suggestion remains to create the documents with much accuracy.

Standard 1.

1. "Cooperation with International Partners" – it is still not clear how the international partners are going to participate in this particular PhD programme. Regarding Alabama University, the complete question remains. The addendum to memorandum (Attachment 9) considers the development of **Joint** Doctoral Programme, which completely differs from what is presented in the PhD programme descriptive.

Standard 2

1. "Evaluation of programme" – the argument does not consider the assessment of educational courses (see syllabi)

Standard 3

1. "Student support and consultations" – acceptable

Standard 4

1. No contradiction can be seen within the expert panel report, which tried to be as positive as possible. The CVs included to the document package do not provide sufficient information on competencies of academic staff, while "live contact" showed the enthusiasm and high motivation and preparedness of teaching staff, which was clearly stated in the report. This is not about cv language, but the poor cv template, not working links to publications, etc. In general, this is another indication of not "proper and accurate" preparation of program specification documents provided for the accreditation procedures.