განათლების ხარისხის განვითარების ეროვნული ცენტრი
NATIONAL CENTER FOR EDUCATIONAL QUALITY ENHANCEMENT

Accreditation Expert Group Report on Higher Education Programme (Final)

Undergraduate educational program
Biomedical Engineering
Georgian Technical University

Date(s) of Evaluation: 8 Nov. 2019

Report Submission Date: 02 Dec. 2019

Tbilisi
2019

HEI's Information Profile

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

Higher Education Programme Information Profile

Name of the Programme	Biomedical Engineering
Level of Education	Undergraduate level
Qualification Granted Indicating Qualification Code	0719 Bachelor of Science in Biomedical Engineering
Language of Instruction	English
Number of Credits	240
Programme Status (Authorized/ Accredited/New)	New

Expert Panel Members

Chair (Name, Surname, University/organization/Country)	Johannes Jan Struijk, Aalborg University, Denmark
Member (Name, Surname, University/organization/Country)	Maia Mantskava, Tbilisi State Medical University, Georgia
Member (Name, Surname, University/organization/Country)	Lasha Laliashvili, Tbilisi State University, Georgia

Accreditation Report Executive Summary

- **General information on the education programme**

  The education programme is the new English-taught undergraduate programme in "Bachelor of Science in Biomedical Engineering". The programme encompasses mathematics, physics, engineering, medical technology and physiology of the human body. Biomedical engineers are highly sought after by health care institutions and by the medical technology industry, internationally as well as in Georgia.

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

  The site-visit consisted of interviews with the 1) University administration, 2) the Head of the programme, 3) the Programme Developers and the Team of the self-evaluation report, 4) Quality Assurance Services, 5) Employers, 6) Teachers, 7) Students, 8) Alumni/graduates.
  In addition, a tour of the teaching facilities and the library was taken.

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

  The programme complies with all accreditation standards.

- **Summary of Recommendations**

  None

- **Summary of Suggestions**

  The time for research of the academic staff is very limited, therefore all efforts to strengthen the research environment and research opportunities are welcomed. The expert panel thus suggests an increased focus of the responsible management on improving the research environment and research time of the academic staff. Only in that way can the goal of research based teaching and the involvement of students in research be fully ensured.

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

  None

- **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

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 programme objectives state: "The objective of Biomedical Engineering Bachelor's Bachelor's Program is to introduce a student's medical equipment and technologies, medical devices and systems, health information technologies; To develop skills for qualified technical services of medical technical systems, ability to perform medical equipment functional, technical condition and expertise. The aim of the program is to provide students with the knowledge of classification, restoration, storage and control of information obtained in health care. Graduates will function effectively in multidisciplinary team environments and communicate effectively to a variety of audiences, providing high quality of health care through using of modern medical techniques and technologies. Program graduates will build and expand upon their undergraduate foundations by engaging in learning opportunities throughout their careers."

The programme objectives define the knowledge, skills and competences in a clear way and in such a way that learning outcomes, and subsequently, study activities can be derived, in complicance with the rules and regulations of the Georgian Technical University and the Mission and Strategy of the Faculty of Informatics and Control Systems.

The programme objectives comply with international standards for Biomedical Engineering, more specifically the programme was derived in compliance with requirements of the American Accreditation Board for Engineering and Technology and has a resemblance with several Biomedical Engineering programmes at recognized American universities.

The objectives are focused on the Georgian labour market for Biomedical Engineers, more specifically on the needs of health care institutions and on the industry that implements and maintains technology in health care institutions.

The programme objectives are accessible at http://biomedeng.gtu.ge/programebiEng.html and at http://biomedeng.gtu.ge/programebi.html .

Evidences/indicators

- Bachelor's educational program (including programm objectives) - 2019.28.06, Order No 942;
- Self evaluation report - 2019.07.09;
- Educational Program in Biomedical Engineering market research;
- The Mission of Georgian Technical University http://gtu.ge/AboutStu/Mission.php; (translated to english)
- GTU Informatics and Control Systems Faculty Provision;
- Agreements with partner universities;
- http://biomedeng.gtu.ge/programebiEng.html;
- The Faculty of Informatics and Control Systems web-page: http://gtu.ge/Ims/
- Interviews during site visit (2019-11-08) with
    - University management
    - Head of the BME programme
    - Employers
    - Alumni of similar programme

Recommendations:

N/A

Suggestions for programme development:

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

1.2. Programme Learning Outcomes

- Programme learning outcomes describe knowledge, skills, and/or the sense of responsibility and autonomy, students gain upon completion of the programme;
- Programme learning outcomes assessment cycle consists of defining, collecting and analysing data;
- Programme learning outcomes assessment results are utilized for the improvement of the programme.

Descriptive summary and analysis of compliance with standard requirements

There is a difference in the wording of the learning outcomes in the Bachelor's Educational Program as approved by the Academic Board of GTU (2019.28.06 Order No 942) and the wording in the self evaluation report, although the essential content is similar. The following relates to Order No 942.

The Learning Outcomes are consistent with the Programme Objective even though the emphasis among the different components is somewhat different. In particular, the weight on information technology is relatively high in the Programme Objective, whereas the Learning Outcomes focus on medical devices and the measurement of physiological signals, with a minor content of information technology.

The Learning Outcomes are clearly described, they can be translated into a study programme and they are achievable within a 240-credits Bachelor engineering programme.

The learning outcomes were defined during a development process that referenced to the National Qualifications framework (Order N 120/N, December 10, 2010) and the Regulations of the Georgian Technical University with respect to educational program planning, development, evaluation and improvement. The development team included the program leader and teaching staff and was based on the evaluations of a similar programme by students, alumni and employers in the field.

The process of evaluation of the learning outcomes is coupled to the performance of the students, the student evaluations, evalutions form alumni, and from the labour market (in this case mostly the health care institutions and vendors/importers of medical devices). This evaluation process is based on the strategic plan of GTU, which also considers modifications of educational programs. The teaching staff of the programme staff have defined the methods of evaluation of the Learning Outcomes in the course syllabi. The evaluation methods are in compliance with Order # 3 of the Minister of Education and Science (2007) and include the midterm and final evaluations. If the evaluations suggest the need for changes in the programme or its learning outcomes then these changes will be implemented.

Evidences/indicators

- Bachelor's educational program (including programm objectives) - 2019.28.06, Order No 942;
- Course syllabi;
- Self-evaluation report, including assessment reports;
- Interviews during site visit
    - University management incl. quality assessment officer
    - Head of programme
    - Teaching staff
    - Alumni of similar programme
    - Employers
    - Students of similar programme

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ 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
Educational programme objectives, learning outcomes and their compliance with the programme	✓			

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.

2.1. Programme Admission Preconditions

Higher education institution has relevant, transparent, fair, public and accessible programme admission preconditions.

Descriptive summary and analysis of compliance with standard requirements

The admission to the programme is based on Georgian legislation for admission to higher education. Applicants must also have confirmed knowledge of the English language at the level of at least B1, an international level II certification with respect to the Test of English as a Foreign Language (TOEFL) or must have obtained their general education in an English spoken programme. At the lack of any such certification an interview in English will be taken required. Those requirements are made clear at the programm's websites, in official materials and on some social media as well.

Evidences/indicators

- Bachelor's educational program (including programm objectives) - 2019.28.06, Order No 942;
- Websites: http://biomedeng.gtu.ge/programebiEng.html; https://bmegtu.wordpress.com;
- Self-evaluation report
- Interviews during site-visit
    - University managemenr
    - Head of programme

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ 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 new English-language undergraduate programme was discussed at the joint meetings of the ABET Committee of the Technical University of Georgia and SDSU-Georgia. The decision was made to submit the program to the ABET experts for evaluation and preparation for ABET accreditation. The course syllabi were developed according to advises received from the ABET Committee, as well as the program planning, development, evaluation, and enhancement rule and learning process management instruction of the Georgian Technical University. This documentation was submitted to the Faculty Council (Protocol N4 from June 21, 2019) and the GTU Academic Council decided to submit the educational program for accreditation to the National Center for Educational Quality Enhancement. The programme development was undertaken in a committee consisting of the Head of the programme, five full professors, three associate and one assistant professor, three students, one graduate of related programme, the president of the Biomedical and Clinical Engineers Association and three representatives from the employers.

The content of the programme fully takes into account and covers the Learning Outcomes, starting at the level of the general pre-university education and finishing at an internationally recognized Bachelor level, where the graduates have been prepared for the labor market as well as for further graduate studies.

The programme has been structure according to legislation and according to the European Credit Transfer System with 60 credits per annuum and with a reasonable, clearly ABET inspired/required, balance among subjects such as mathematics, physics, engineering, physiology and medical technology.
Mandatory courses comprise a total of 155 credits, elective courses count for 67 credits, whereas the team project on the 7th semester and the capstone project on the 8th semester are scheduled for 6 credits and 12 credits, respectively.
Courses and laboratory practice flows in a logical and orderly way and prepare for the elective courses and projects in the final semesters. The courses and laboratories are up to date and at the forefront of modern technology.

A research component is present although relatively limited and it should be of some concern for the programme responsibles as well as to university/faculty management to promote further development of the research environment at the department.

Full information of the programme is available in the description of the Educational Programme.

Evidences/indicators

- Bachelor's educational program - 2019.28.06, Order No 942;
- Websites: http://biomedeng.gtu.ge/programebiEng.html; https://bmegtu.wordpress.com;
- Self-evaluation report including curriculum map
- Syllabi of all teaching activities
- Interviews during site-visit
    - Head of programme
    - Self-evaluation committee
    - Teachers
    - Students in related field

Recommendations:

N/A

Suggestions for programme development:

Special focus on further development of the research environment is warranted.

Best Practices (if applicable):

N/A

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

N/A

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

☐ 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

A full list of syllabi including learning outcomes, course contents and evaluation criteria was provided. The connection between course content and learning outcomes was exemplary, giving a clear opportunities for assessment of all individual learning outcomes. An example of this is the course "Biomedical transducers": The learning outcomes are clearly described in terms of Knowledge and understanding, Skills, and Responsibility & autonomy, and the course contents, which includes laboratory work, closely resembles those learning outcomes. Course contents were also at the level required for an internationally recognized Bachelor in biomedical engineering education.

Although some of the courses are indeed challenging, in general the study load for the students is well reflected in the number of credits for each course. The number of contact hours for each course is deemed in line with international practice.

The mandatory literature as specified in the syllabi is in generally modern and corresponds to the contents of the various courses.

Evidences/indicators

- Bachelor's educational program - 2019.28.06, Order No 942;
- Websites: http://biomedeng.gtu.ge/programebiEng.html; https://bmegtu.wordpress.com;
- Self-evaluation report, incl. curriculum map
- Syllabi of all teaching activities
- Interviews during site-visit
    - Head of programme
    - Self-evaluation committee, including quality assessment officer
    - Teachers
    - Students in related fields
    - Alumni in related fields

Recommendations:

N/A

Suggestions for programme development:

One of the programme objectives is "to work closely with health care professionals". Everyday life of the health care professional is focused on pathology. Programme management may evaluate whether the students gain a basic understanding of the main pathologies in addition to their knowledge about anatomy and physiology.

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

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

Practical skills in the first five semesters are obtained through laboratory activities related to several courses in physics, programming and engineering. In semester VI a 6 credits Clinical Practice, with focus on medical device design and biomedical instrumentation is scheduled, which is a prerequisite for the 7th semester team project (6 credits), which in turn prepares the students for a 12 credits "capstone" final project in the final semester. Especially in the final project students may be involved in research projects sprouting from the research activities of the academic staff and they are supervised and assessed by those active researchers. Occasionally, the results of the final projects are published through appropriate scientific channels.

Employers and alumni were in favour of increasing the volume of the practical and research activities in the programme, although the programme does indeed have those components and complies with the standards and the programme objectives, even if in a relatively limited way.

Apart from the mandatory activities mentioned above, there are opportunities for students to engage in activities through local (e.g. Tbilisi Medical University) and international (e.g., Julrich Scientific Research Center, Germany, West Pomeranian University, Poland) agreements.

Transferable skills are partly obtained through the above collaboration agreements, but mostly through a group project, research project, clinical practice and several opportunities for collaborations.

Evidences/indicators

- Bachelor's educational program - 2019.28.06, Order No 942;
- Self-evaluation report
- Syllabi of teaching activities
- Agreements and Memoranda
- Interviews during site-visit
    - Head of programme
    - Teachers
    - Employers
    - Alumni in related fields

Recommendations:

N/A

Suggestions for programme development:

A stronger emphasis on practical and research skills could be considered in further programme development.

Best Practices (if applicable):

N/A

-

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

N/A

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

Teaching methods are varied and flexible, ranging from lectures with active student participation to laboratory exercises and student projects. Elements of learning methods include discussions, cooperative training, group work, problem based activities case studies and brainstorming. In the related English taught programme the low number of (foreign) students makes it relatively easy to individualize the teaching activities if necessary, and also to deal with eventual deficiencies in students' pre-existing knowledge or skills, possibly by guided short introductory learning activities.

In general, students can seek individual counseling during the scheduled consultation hours with their teachers and they may ask questions to their teachers via email.

Evidences/indicators

- Bachelor's educational program - 2019.28.06, Order No 942;
- Self-evaluation report
- Syllabi of all teaching activities
- Interviews during site-visit

- Teachers
- Students in related fields
- Alumni in related fields

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

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 student evaluation rules are in accordance with the Academic Achievement Monitoring System of the Georgian Technical University and the rules are well described in the Bachelor's Educational Program, in the course syllabi and are also available via the web site of the programme. The syllabi clearly indicate the learning outcomes, course activities and materials as well as evaluation criteria.

Evaluators, the academic staff, are well aware of the system, which is transparent and closely related to the learning outcomes.

Students can receive feedback on their shortcomings after the publication of the evaluations, by contacting the subject's teacher.

Neagtive evaluations may either result in a re-exam shortly after the ordinary exam, or in case of a clear failure, the student can retake the course.

Students can also give feedback to the programme responsibles via student surveys.

Evidences/indicators

- Bachelor's educational program - 2019.28.06, Order No 942;
- Self-evaluation report
- Syllabi of all teaching activities
- GTU Academic council resolution No 198, 2011, on "Guidelines of learning process management"
- GTU Academic achievement monitoring system of students
- Student survey results
- Interviews during site-visit
    - Head of the programme
    - Teachers
    - Students in related fields
    - Alumni in related fields

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

-

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

N/A

Evaluation

✓ 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	✓			

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.

3.1. Student support services

Students receive appropriate consultations and support regarding the planning of learning process, improvement of academic achievement, employment and professional development.

Descriptive summary and analysis of compliance with standard requirements

Students have ample opportunity to receive information , consultation and support at different levels in the University organisation. The teacher provides the student with information on the advisory services considered in the syllabus and establishes an individual counseling schedule available to the student, both online and in a visible place at the relevant departments. In each training course, the teacher's academic workload is supplemented by 5 advisory hours per academic group. Students have also access to a Counseling Service for the improvement of their academic achievements and there is a Career Support Service to support employment and career development.

The university has developed a financial support mechanism to support socially vulnerable students. The university provides the following benefits for students with special educational needs and disabilities: Improvement of the material-technical base, appointment of assistants, individual curriculum (if needed), etc.

Educational programs are evaluated by a Faculty Commission composed of students and academic staff. Student surveys are conducted periodically with focus on the educational programs structure, content and the appropriateness of human and material resources.

The electronic Student Information System provides students with a timely access to the assessment results. They can receive an information about ongoing processes and news (administrative issues, social assistance, leisure services, etc.).

Students have opportunities to participate in various university, local and international projects and events, including scientific-practical conferences and seminars. Under the ERASMUS agreement it is possible for students to visit the Jurlich Scientific Center (Germany) and the West Pomeranian University (Poland) for projects. Also, joint projects wit the Tbilisi Medical University are possible, Students also are informed about other international exchange programs and projects through the staff of the GTU International Relations and Standards Service and the web-page of this service.

Evidences/indicators

- Bachelor's educational program - 2019.28.06, Order No 942;
- Self-evaluation report
- Syllabi
- Student survey results
- Interviews during site-visit
    - Head of the programme
    - Teachers
    - Students in related fields
    - Alumni in related fields

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

3.2. Master's and Doctoral Student supervision
Master's and Doctoral students have qualified thesis supervisors.
Descriptive summary and analysis of compliance with standard requirements N/A
Evidences/indicators N/A
Recommendations: N/A
Suggestions for programme development: N/A
Best Practices (if applicable): N/A
In case of accredited programme, significant accomplishments and/or progress N/A
Evaluation N/A

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	✓			

4. Providing teaching resources

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

4.1 Human Resources

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

Descriptive summary and analysis of compliance with standard requirements

The teaching staff consists of 17 full time employed academics, including 9 full professors, and 2 invited teachers, thus ensuring the sustainability of the programme. The CVs showed a large variation in research performance, varying from an internationally very high standard to a rather low research output, although with a reasonable average given the rough estimate of 20% research time versus 80% teaching for the academic staff, as became clear during the site-visit interviews. The head of the programme is fully involved in programme development and evaluation and has an extensive connection with academic national and international educational organisations. Apart from the teaching tasks the staff also has advisory functions with respect to the students, activities for which also a resonable number of hours is allotted.

The teaching staff has a very good command of the English language, a prerequisite for an English taught programme, and also has the right background and qualifications, according to Georgian legislation, for the respective courses given in the programme. The teaching staff were mostly very experienced with a few younger staff as well.

The number of supporting / administrative staff is adequate.

Evidences/indicators

- CVs of staff
- Self-evaluation report
- Survey results
- Interviews during site-visit
    - University management
    - Head of the programme
    - Teachers
    - Employers
    - Students
    - Alumni

Recommendations:

N/A

Suggestions for programme development:

The expert panel suggests an increased focus of the responsible management on improving the research environment and research time of the academic staff. Only in that way can the goal of research based teaching and the involvement of students in research be fully ensured.

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

4.2 Professional development of academic, scientific and invited staff

➢ HEI conducts the evaluation of programme academic, scientific and invited staff and analysis evaluation results on a regular basis;

- HEI fosters professional development of the academic, scientific and invited staff. Moreover, it fosters their scientific and research work.

Descriptive summary and analysis of compliance with standard requirements

The Professional Development Center of the Georgian Technical University has developed several measures to improve and ensure staff development including the course "Modern teaching and learning methodologies in university education", which has been passed by the teaching staff in the Biomedical Engineering programme. The activities (both in research and teaching) are evaluated with respect to quality, among others through surveys, in compliance with the "Human resources management policy and strategy" of the Georgian Technical University, the results of which are also used for further careeer development. Apart from the evaluations, the policies include stimulation of the professional development of the staff and periodic surveys among students, graduates and employers.

Most of the academic staff have participated in national and international conferences, symposiums and seminars amd the programme has an active involvement in European TEMPUS projects.

Evidences/indicators

- CVs of all the teaching staff
- Self-evaluation report
- Interviews during site-visit
    - Head of the programme
    - Teachers
    - Students

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

-

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

4.3. Material Resources

Programme is provided by necessary infrastructure and technical equipment required for achieving programme learning outcomes.

Descriptive summary and analysis of compliance with standard requirements

The Faculty of Informatics and Control Systems, where the programme is implemented has an excellent provision of lecture rooms, journalsmodern (2019) laboratories, teaching inventory and a library of the Informatics and Control Systems Faculty, as well as the central university library. The laboratories include equipment relevant for the specifics of the Biomedical Engineering programme. The libraries contain up-to-date literature relevant for BME, the basic literature as defined in the syllabi as well as access to relevant international journals and databases.

Evidences/indicators

- Self-evaluation report
- Interviews during site-visit
    - Students
    - Teachers
- Tour through the labs and library during site-visit

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

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 programme is sufficiently funded and according to national legislation and is part of the faculty budget. The Biomedical Engineering budget is calculated by the management office of the Faculty of Informatics and Control Systems according to the rules and practice of the Georgian Technical University. In addition, foreign students are enrolled on a full cost covering fee.

Evidences/indicators

- Self-evaluation report
- Interviews during site-visit
    - University management
    - Head of programme
- Budget of the faculty of Informatics and Control Systems

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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In case of accredited programme, significant accomplishments and/or progress
N/A
Evaluation ✓ 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
Providing teaching resources	✓			

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.

5.1 Internal quality
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.
Descriptive summary and analysis of compliance with standard requirements The staff of Program collaborates with the internal Quality Assurance Service in the planning of the program's quality appraisal process, the development of appraisal tools, and the implementation of quality appraisal results to improve the program. The staff involved in the program collaborates with the internal Quality Assurance Service in the planning of the program's quality assessment process, the development of assessment tools, and the implementation of the assessment and uses the quality assessment results to improve the

program; Program staff take into account the results of the quality assessment when making program decisions; Academic, administrative and support staff are involved in the preparation of the program self-assessment report; The Internal Quality Service, together with the staff involved in the program, takes care to eliminate any shortcomings identified in the self-assessment report; The quality assurance of the program is based on the principle of "plan, implement, test, develop".

Evidences/indicators

- Self-evaluation report
- Student survey results
- Quality Assurance website: http://gtu.ge/quality/English/
- Interviews during site-visit
    - Quality Assurance staff
    - Head of the programme
    - Students
    - Alumni
    - Teachers

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

5.2 External quality

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

Descriptive summary and analysis of compliance with standard requirements

The program uses external quality assessment, including the ongoing ABET accreditation process for the program. Workshops were held to discuss the accreditation requirements. Staff and administration review and comply with note received during accreditation (national and / or international) and with the results of the Employer Attitude Survey. The NCEQE accreditation process is a key measure for the quality assurance and the university works closely with the national center for Education Quality Enhancement.

Evidences/indicators

- Self-evaluation report, including results from Employer Attitude Survey Report
- Interviews during site-visit
    - Quality Assurance staff
    - Head of the programme
    - Employers
    - Alumni

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

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

N/A

Evaluation

✓ Complies with requirements

☐ Substantially complies with requirements

☐ Partially complies with requirements

☐ Does not comply with requirements

5.3. Programme monitoring and periodic review

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.

Descriptive summary and analysis of compliance with standard requirements

Program monitoring and periodic evaluation is carried out through systematic collection, processing and analysis of information with the involvement of academic, scientific, invited administrative, support staff, students, alumni, employers, and other stakeholders. Evaluation results are used to improve the program. Modification / adaptation of the program and / or evaluation system is based on the analysis of the evaluation results to ensure its updating; If necessary, the program uses peer review (by Georgian and / or foreign counterparts employed in other HEIs) to improve the program; Where appropriate, the pre-defined form of the program assesses the teaching of academic staff to improve the quality of teaching; To have a stable high quality of the programme, at the end of each major course, students evaluate the course; The program is periodically compared with similar programs of foreign universities. In order to bring the program up to date with modern requirements, best international practice has been applied.

Evidences/indicators

- Self-evaluation report
- Student survey results
- Results of evaluation of teaching staff
- Quality Assurance website: http://gtu.ge/quality/English/
- Interviews during site-visit
    - Quality Assurance staff
    - Head of the programme
    - Students
    - Academic staff

Recommendations:

N/A

Suggestions for programme development:

N/A

Best Practices (if applicable):

N/A

In case of accredited programme, significant accomplishments and/or progress N/A
Evaluation ✓ 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 quality enhancement opportunities	✓			

Enclosed Documentation (If Applicable) N/A

HEI's Name: Georgian Technical University

Higher Education Programme Name: Biomedical Engineering

Number of Pages of the Report: 30

Programme's Compliance with the Standard

Standard	Complies with Requirements	Substantially 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	✓			
2. Teaching methodology and organization, adequate evaluation of programme mastering	✓			
3. Student achievements and individual work with them	✓			
4. Providing teaching resources	✓			
5. Teaching quality enhancement opportunities	✓			

Expert Panel Chair's

Name, last name, signature: Johannes Jan Struijk

Expert Panel Members'

Name, last name, signature: Maia (Maka) Mantskava

Name, last name, signature: Lasha Laliashvili