



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus Gedimino technikos universiteto  
***TELEKOMUNIKACIJŲ INŽINERIJOS STUDIJŲ***  
***PROGRAMOS (61201T207, 612H64002)***  
**VERTINIMO IŠVADOS**

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**EVALUATION REPORT**  
**OF TELECOMMUNICATIONS ENGINEERING**  
**(61201T207, 612H64002)**  
**STUDY PROGRAMME**

at Vilnius Gediminas Technical University

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Team leader:

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Išvados parengtos anglų kalba  
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Vilnius  
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## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Telekomunikacijų inžinerija</i>
Valstybiniai kodai	61201T207, 612H64002
Studijų sritis	Technologijos mokslų
Studijų kryptis	Elektronikos inžinerija, Elektronikos ir elektros inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4), iššęstinė (5,5)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Telekomunikacijų inžinerijos bakalauras
Studijų programos įregistravimo data	2002.06.14

## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Telecommunications Engineering</i>
State code	61201T207, 612H64002
Study area	Technology Sciences
Study field	Electronic engineering, Electronic and Electrical Engineering
Kind of the study programme	University Studies
Study Cycle	First
Study mode (length in years)	Full-time (4), part-time (5,5)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Telecommunication Engineering
Date of registration of the study programme	14.06.2002

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The Centre for Quality Assessment in Higher Education

# CONTENTS

CONTENTS .....	3
I. INTRODUCTION.....	4
II. PROGRAMME ANALYSIS .....	5
1. Programme aims and learning outcomes.....	5
2. Curriculum design .....	6
3. Staff .....	7
4. Facilities and learning resources .....	8
5. Study process and student assessment.....	9
6. Programme management .....	10
III. RECOMMENDATIONS .....	11
IV. SUMMARY .....	13
V. GENERAL ASSESSMENT .....	14

## I. INTRODUCTION

An external evaluation of the Telecommunication study programme from Vilnius Gediminas Technical University, has been conducted by an international expert group consisting of Prof. Dr. Palle Jeppesen (leader of the group), Prof. Dr. Igor Kabashkin, Prof. Dr. Luis Torres, Mr. Edvardas Linkevičius and Mr. Andrius Kučinskas. The group performed an on-line analysis of the self-evaluation report before the visit, and held meetings during the visit with the administrative staff of the Faculty of Electronics and Department of Telecommunications Engineering, the workgroup in charge of the preparation of the self-evaluation report, teaching staff and students of the study programme, as well as with recent graduates and employers.

The Centre of the Studies Quality Assessment (SQAC) conducted a first official external evaluation of the Telecommunication engineering study programme in 2004 whose outcome was made available to the international expert group. No further external evaluation has been carried out since then.

The main objectives of the international expert group have been to assess the information provided in the self-evaluation report, as well as to gather more facts and evidences in the on-site visit in order to perform a fair evaluation of the programme.

The international expert group would like to acknowledge the help and all facilities provided by the various Faculty of Electronics and Department of Telecommunications Engineering to perform the evaluation. The international expert group would like to acknowledge as well all the effort made by Centre for Quality Assessment in Higher Education and in particular Mr. Pranas Stankus who has allowed a very smooth evaluation process.

## II. PROGRAMME ANALYSIS

### *1. Programme aims and learning outcomes*

The Telecommunication Engineering Bachelors programme of VGTU has been taught since 2002. There are full-time and part-time options since 2002. In addition, the programme has Telecommunication Technologies and Telecommunication Management specializations. The study programme was reviewed and partially updated in 2008 and 2011 on purpose of specialize it in detail.

The aim of this Programme is directly related to the Government program of Lithuanian Republic set in resolution No. 1270 "National Lisbon strategy implementation program"(State news 2005, No. 78-2823) of November 22, 2005, where the goals for the creation of the knowledge society and knowledge-based economy in Lithuania are indicated.

The overall aims of the programme are:

- to provide students with enough knowledge base of mathematics and other physical sciences, fundamentals of electronics and telecommunication engineering sciences, engineering design and to develop skills in applying that knowledge in the engineering practice;
- to develop a need to be interested in news on electronics and telecommunication engineering sciences, to apply them in various circumstances, to be able to combine application skills with fundamentals of management, knowledge of humanities and social sciences, to recognize influence and significance of engineering decisions on the social development, to work in a global engineering marketplace and to use hi-tech technologies;
- to develop wide erudition, ability to critically analyze and creatively solve problems in the field of telecommunication engineering;
- to develop ability to maintain professional competence throughout life-long learning.

The results of study in the programme are divided into four groups: knowledge; understanding; special skills; general skills. The learning outcomes focus on deeper understanding of the functioning principles of engineering equipment and the use of natural laws and mathematical relations to solve engineering problems. The main learning outcome is the ability to renew and extend knowledge and to apply it in the quickly changing electronics and telecommunications fields.

In this context, the programme aims and learning outcomes are clearly defined. They are also publicly accessible as shown in some leaflets and web page of the University.

A very good and detailed study has been made of the needs of the public sector and labour market. Many questionnaires have been sent to many telecommunication Lithuanian companies to find out about needs of the national labour market. In addition, a complete search study on the needs of the European market in the Telecommunication sector has been carried out as well.

The learning outcomes are defined very clearly. The results of study in the programme are divided into four groups: knowledge; understanding; special skills; general skills. All of them are divided at subareas which are formulated by evaluating the requirements raised for the professionals of this area.

## ***2. Curriculum design***

The curriculum design of the Telecommunication Engineering study programme is based on 240 credits and has two specializations: telecommunication technologies and telecommunication management. The programme offers full-time and part-time options. The curriculum design meets all legal requirements. Bologna process recommendations have been taken into account as well. Theoretical and practical teaching according to the course schedule is implemented. Study programme is in general coherent but some remarks would need to be taken into account as noted in the following.

The general university study subjects take 15 credits and offer Philosophy of Technology, Culture of Professional Language, Ethics or Civil Psychology Alternatives and Foreign Language Alternatives which in total represents 6.2% of the whole programme. It is appreciated that such courses provide some added value to the students. However, given that this general background may be acquired before university studies and given the amount of telecommunications issues that are not covered in the programme, some reduction in these courses might be considered. In addition, very few international curriculums in Telecommunication programmes have such courses.

The core subjects in engineering take 68 credits and offer, among others, Chemistry, Engineering and Computer Graphics, Human Safety, Script Programming, Mechatronics Equipments. The relevance of such courses in a Telecommunication Engineering study seems questionable and may be reconsidered. Although some general engineering courses may be adequate, the number of credits allocated to these subjects may need to be reviewed. The students taking the programme have also confirmed this statement. The Mathematics and Physical Sciences subjects have a total of 33 credits that in general are well balanced among all the credits of the programme. However Chemistry is offered as well, which provides little added value to the programme. In addition, it has to be noted that very few international curriculums in Telecommunication programmes, have Chemistry as a mandatory course.

The study programme was reviewed and partially updated in 2008 and 2011 on purpose of specialize it in detail. Since 2008, the following study subjects were withdrawn: "Electronics technologies" and "Image technologies". A separate study subject of "Digital signal processing in telecommunication systems" was introduced, which was in 2011 modified into "Digital signal generation and processing" and moved to the fifth semester. Also, some quite general study subjects were withdrawn, such as "Microprocessors" and "Computer structure and operational systems", and more relevant subjects were introduced again, such as "Systems of micro-controllers" and "Telecommunication system software" (Telecommunication technology specialization) as well as "Electronic business systems" and "Telecommunication systems, services and business" (Telecommunication management specialization).

During the meeting, the administration staff stated that they are willing to change some broad topics and offer more innovative options.

The Social Sciences subjects have a total of 15 credits and offer a good introduction to economics and management.

The Core subjects of the study fields have a total of 58 credits that in general are well balanced among all the credits of the programme.

The telecommunication technologies and telecommunication management provide two adequate specializations in the programme as well as some other optional courses. However, and

given the importance of multimedia and wireless communications, cloud technologies, mobile applications some courses in this area may give an added value to the programme.

Some of the courses have the names Course 1, Course 2, etc. In a general context and for a better understanding of the course contents, such names should be avoided.

The names of the courses Telecommunication Theory and Introduction to Telecommunication Engineering may prove to be misleading. There is a need to take a more realistic approach and change names as it is difficult to distinguish the contents. The name of Software of Telecommunication Systems may also prove misleading, as there is software in any topic of telecommunications; the topic could be directly included in some basic courses (Programming Language C, Programming Language C++ and Script Programming).

As to the teaching methods, unfortunately no active use of electronic learning systems was reported or demonstrated. In accordance of VGTU administration decision e-Studio system from 04 February 2013 will be disabled. This information appeared on the website of the University during the expert visit of Department of Telecommunications Engineering. Education materials in the new e-study environment Moodle were absent. Students during meeting confirmed that content of programme in the Moodle is limited and not in active use. Separate educational material was available to them through Intranet access from the database at the department server.

### ***3. Staff***

An average of 73 faculty staff members have been involved in the Telecommunications programme in the period of 2006-2012. Most of them hold a Ph.D. degree which assures a high level academic staff. The average age of the university teachers of Telecommunication engineering is 43 years. There are 60 % of university teachers who are under 40 years of age. There are 10 % of university teachers who are older than 60 years. Half of the university teachers of elderly age are professors. These university teachers are good specialists, having a great academic and practical experience and being able to pass this experience to younger university teachers. The staff providing the programme meets the legal requirements. The teaching staff turnover is acceptable.

In the Department of Telecommunication engineering, three settled university teachers-docents work half-time (0.5 of establishment). Their main workplaces are in the companies of modern telecommunications. Participation of these university teachers in the process of teaching and department activity forms conditions for constantly updating the knowledge about the newest telecommunication technologies and services.

The number of lecturers/students ratio has been of 0.24 in the year 2012, which is very good and assures a good contact between lecturers and students and proves adequate to ensure learning outcomes. This may show a lack of programme's interest that should be corrected in the mid-term future.

VGTU creates conditions for the professional development of the teaching staff necessary for the provision of the programme. In particular, VGTU has organized various qualification-raising courses for their employees. The qualification scientific research works are very useful for professional self-development. For example, during the last 5 years 24 university teachers of the study programme of Telecommunication engineering accomplished 5 qualification scientific research works (Composition and investigation of adaptive wireless local networks - WLAN

protocol models, Composition of evaluation criteria for service quality of telecommunication network of future generations as well as composition of accounting methods, Development of processing technologies of nonlinear digital signals, Study of sources of non-ionizing radiation of electromagnetic fields in close environment, Studies of multimedia services rendered via electronic networking and creation of quality assessment means).

In the international mobility area, staff has opportunities to go to other international universities. However, very limited number of professors made use of this opportunity. For example, during last 5 years out of 63 teachers only 7 participated in the international visit programmes in abroad universities. Among these 7 teachers 4 colleagues participated in such visits 2 and 3 times. Some of the staff attend international conferences to present research results. This lack of international mobility threatens the international vision of the staff and of the University in general and should be improved.

In the research context, the teaching staff of the programme is not involved wide enough in national and international research directly related to the telecommunication engineering. For academic staff COST (COST – European programme on Co-operation in the Science and Technology) actions is the most popular among European scientific programmes. It can be recommended that a more active participation in the projects of the EU Framework Programme is established. Efforts should be made by both, the University to provide the adequate environment and the teaching staff to increase their involvement in high quality international research.

#### ***4. Facilities and learning resources***

The space allocated to each student and the corresponding studying conditions seem sufficient both in their size and quality to assure a comfortable learning environment. Also good lab facilities including modern equipment were found in many cases. However, although it is completely understood that the latest equipment may not be updated constantly for economic reasons, some laboratories were found outdated with regard to the state of the art in Telecommunications; especially fiber-optic equipment turned out to be rather limited and with great need to be expanded and updated. Laboratories must have opportunities to develop practical designing and exploitation skills of the main telecommunications networks and technologies, in particular:

- Core network: transmission, aggregation and service delivery platforms.
- The main optical and access technologies: FTTx (Fiber to the x), point-to-point, xPON (Passive Optical Network).

Update of the equipment relies to some extent on the industrial partners. This is a very good sign of cooperation between the University and the companies, but may prove insufficient to accommodate the latest developments.

Almost all textbooks are in Lithuanian which indicates a good involvement of national faculty in the field. However, more English books should be used which would provide a double added value. First, as the options are much wider, the students would have access to the latest developments in the Telecommunication area. Secondly, the students would be exposed to all technical English terms in the field which would offer additional skills, as all the updated literature is in English.



Library facilities are good; students have access to a great variety of books, journals, different teaching materials and databanks including – although indirectly - the important IEEE (IEEE-Institute of Electrical and Electronics Engineers) journals; IEEE is the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. IEEE produces 30% of the world's literature in the electrical and electronics engineering, telecommunication and computer science fields.

### ***5. Study process and student assessment***

The admission requirements are well founded. The admission to the Telecommunications first cycle study programme in Faculty of Electronics is carried out according to the Procedure description of the General admission to Lithuanian higher education first cycle and integrated studies issued in 2011. This description has been prepared by the Association of Lithuanian higher education to organize the general admission and approved by the President of the Republic of Lithuania. According to the Republic of Lithuania Law on Science and Studies the persons with the secondary education are accepted to the state-funded and paid places. The admission is carried out by a tendering procedure. The admission is carried out in two stages: the general admission under a common application to all the major education studies' programs of the higher schools or program groups and an additional admission to the free remaining state-funded and paid study places.

The detailed information about the first cycle of Telecommunications study programme and admission to Lithuanian higher schools' first cycle programmes is published in the University website. Students are encouraged to achieve good results by supplying them with complete information about their studies, the procedure, the usefulness of subjects, the level of their complexity and employment perspectives.

The studies are organized in autumn and spring semesters that each last 16 weeks, according to the schedule announced in the University Internet page and the annual VGTU Study Programmes edition, following the individual plans and timetables. The organization of the study process ensures an adequate provision of the programme and the achievement of the learning outcomes.

According to the self-evaluation report, the most talented students are attracted to the scientific-research activity that is carried out by the lecturers. However, from the information found out on the site visit, not much involvement of students in research activities has been observed. In addition, and due to the limited research activity of the teaching faculty, not very much student involvement in research can be expected.

Students have the opportunity to participate in the international mobility programmes. However, as explained in the self-evaluation report and confirmed on the site-visit, the number of participating students is very limited. Some actions by the Faculty of Electronics to promote these international exchanges would be very welcomed. Particular actions could be to increase the student's stipend, or the Faculty budget, needed to cover travel and living expenses and to increase the number of international institutions involved in the mobility plan. In addition, some additional effort to advertise more intensively the advantages of going abroad would be very useful for the students.

The higher education institution ensures an adequate level of academic and social support. In addition, the assessment system of student's performance is clear, adequate and publicly available.

The students' achievement assessment criteria are made public at the beginning of the semester: during the first lecture, the lecturer introduces students to the study subject, purpose, themes, the individual work schedule of tasks and their impact on the final grade. In this context, the assessment system of student's performance is clear, adequate and publicly available. In addition, the professional activities of the majority of graduates meet the programme providers' expectations.

From meetings with the teachers and students the expert team got the impression that the communication between Faculty and students is good and constructive. But students of VGTU would like more informal communication with teachers including different common social events.

## ***6. Programme management***

Management of the study programme and decision making is regulated by VGTU statute, VGTU general faculty provisions, VGTU general faculty committee provisions, VGTU study provisions, VGTU study committee provisions, VGTU faculty study committee provisions. In the Faculty of Electronics in VGTU, Cycle I study programmes or their specializations are supervised by profile departments. The new programmes are prepared and the present are revised and renewed by the formed groups of organisers, whose chairman is also a manager of the programme (specialization) preparation, implementation and supervision. According to VGTU requirements for the 1st study cycle degree university studies programmes and the description of their formation order, the organisers' group submits the new or renewed study programme (specialisation) and study subject modules for the consideration by the Faculty Committee. With the approval of the Faculty Study Committee, the new or renewed study programme is submitted to the Faculty Council for the approval. With the approval of Faculty Council, the new study programme is submitted to the VGTU Study Committee for consideration, and with its approval - to VGTU Rector and Senate. The new programme is submitted to the Study Quality Assessment Centre of expertise, and the new specializations are approved by the VGTU Senate.

The members of the Study Committee have great pedagogical and programme expert experience. The Study Committee is responsible for the structure of the programme, correspondence to the regulation of technological sciences and other requirements of the first cycle study programmes. The departments implementing the programme are responsible for the study subject module content, level and methodical preparation.

All university teachers are involved in the preparation of the study programmes. The modules of the subjects of the study programme, after assessing the remarks and wishes of social partners, are arranged in the departments.

In order to ensure the inner study quality in VGTU, the quality management system complying with the European standard EN ISO 9001:2000 and the requirements of EUA post secondary education quality ensuring standard is implemented for all the university processes. The documents of VGTU quality management system integrate the national and international requirements, which are relevant for organising and implementing the university quality studies.

When implementing and renewing the study programme of Telecommunication engineering, the following study processes are controlled: Study programme preparation and improvement; Subject module preparation and improvement; Knowledge assessment and advancement monitoring; Thesis preparation; Practice organisation; Study process implementation control; Human resources management; Self analysis and feedback; Admission to the university.

Assessment and essential development of the study programmes happens while updating the study programmes. This happens every 2 - 4 years in the university (in 2003, 2007, 2011). Separate modules of the subjects of the programme studies are constantly developed in the department. Internal assessment of the study programmes is accomplished with reference to VGTU regulation.

In 2010, the Faculty of Electronics administered the project financed by the structural funds of the European Union "Essential renovation of Cycle I study programmes of the Faculty of Electronics of VGTU". During its fulfilment, the study programme of Telecommunication engineering is comprehensively analyzed and assessed, study subject modules are updated, part of study subject modules are changed with new ones. The influence of professional practice was increased for the development of student's abilities, the topics of complex course project were related to the topics of the final thesis, etc. It was ascertained what study literature is mostly needed and it was anticipated to purchase or arrange new methodological means. Study programmes were updated, and the annotations of the modules are now available in the website of VGTU.

On the website of the University and of the Faculty there is no information on the quality system and its basic documents.

In the assessment report no explicit vision is apparent for the future development of the program. Such a vision should be developed

### III. RECOMMENDATIONS

#### **Curriculum design**

1. It would be useful include in the programme such courses as Optical and Multimedia Communications.
2. Consider eliminating Chemistry, Human Safety, Script Programming, Mechatronics Equipments and substitute them by more courses on Wireless and Optical communication technologies. Consider including Multimedia Communications.
3. Consider changing the names of some programme courses to distinguish the contents. In particular, Telecommunication Theory, Software of Telecommunication Systems and Introduction to Telecommunication Engineering.
4. Consider changing the name of the courses Course 1, Course 2 to distinguish the contents.
5. It is advisable to harmonize the large number of courses related to the software (Programming Language C, Programming Language C++ and Script Programming, Software of Telecommunication Systems), to target the needs of the telecommunications domain.
6. Curriculum can be improved by revising the difference in courses between two specialities of the programme (Telecommunication Technologies and Telecommunication Management), which now is too small.
7. Special courses on speciality may be included from first year of education.

#### **Staff**

1. Strong efforts should be made to involve faculty staff in stays in international universities and research institutions.
2. Strong efforts should be made to involve more faculty staff in cutting edge research activities.
3. Measures should be taken to promote a more active involvement of teachers in the mobility programme ERASMUS.
4. Efforts should be encouraged to potentiate English teaching activities.

#### **Facilities and learning resources**

1. Strong efforts should be made to have the latest equipment in the laboratories.
2. Efforts should be made to increase the number of English textbooks to be used in the courses.
3. Strong efforts should be made to have all possible teaching material in the University virtual education environment Moodle.

#### **Study process and student assessment**

1. Efforts should be made to involve students in staff research activities.
2. Strong efforts should be made to involve students in international mobility programmes.

#### **Programme management**

1. Strong efforts should be made to involve students and alumni in the evaluation of staff activities.

## IV. SUMMARY

### **Programme aims and learning outcomes**

The programme aims and learning outcomes are clearly defined.

### **Curriculum design**

The curriculum design meets all legal requirements. Bologna process recommendations have been taken into account as well. Theoretical and practical teaching according to the learning outcomes is implemented. Study programme is in general coherent.

Reduction in the general university study subjects and other non-telecommunications subjects should be considered. Substitute them by more courses on Wireless and Optical communication technologies. Consider including Multimedia Communications. Change the names of some programme courses to distinguish the contents.

### **Staff**

The staff assures a high academic level. The staff providing the study programme meets legal requirements. The lecturers/students ratio is very good.

Staff should be much more involved in international stays and cutting edge research efforts.

### **Facilities and learning resources**

The space allocated to each student and the corresponding studying conditions are good enough to assure a comfortable learning environment.

Efforts should be made to have the latest technological equipment in the laboratories.

### **Study process and student assessment**

The admission requirements are well founded. The higher education institution ensures an adequate level of academic and social support. In addition, the assessment system of students' performance is clear, adequate and publicly available.

Strong efforts should be made to involve students in international mobility programmes.

### **Programme management**

Internal quality assurance measures seem to be effective and efficient. A large number of practical telecommunication study's quality assurance methods are used. Information and data on the implementation of the programme are regularly collected and analyzed.

Strong efforts should be made to involve students and alumni in the evaluation of staff activities.

## V. GENERAL ASSESSMENT

The study programme *Telecommunications Engineering* (state codes – 61201T207, 612H64002) at Vilnius Gediminas Technical University is given **positive** evaluation.

*Study programme assessment in points by evaluation areas.*

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	4
2.	Curriculum design	3
3.	Staff	3
4.	Material resources	3
5.	Study process and assessment (student admission, study process, student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	3
	<b>Total:</b>	<b>19</b>

\*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

Grupės vadovas:

Team leader:

Prof. Emeritus Dr. Palle Jeppesen

Grupės nariai:

Team members:

Prof.dr. Igor Kabashkin

Prof.dr. Luis Torres

Mr. Edvardas Linkevičius

Mr. Andrius Kučinskas

<...>

## V. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus Gedimino technikos universiteto studijų programa *Telekomunikacijų inžinerija* (valstybinis kodas – 61201T207, 612H64002) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	4
2.	Programos sandara	3
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	<b>Iš viso:</b>	<b>19</b>

\* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

## IV. SANTRAUKA

### Programos tikslai ir studijų rezultatai

Programos tikslai ir studijų rezultatai yra aiškiai apibrėžti.

### Studijų turinio struktūra

Studijų turinio struktūra tenkina visus teisinius reikalavimus. Buvo atsižvelgta taipogi į Bolonijos proceso rekomendacijas. Vykdomas teorinis ir praktinis mokymas pagal studijų rezultatus. Studijų programa yra apskritai nuosekli

Reikėtų apsvarstyti galimybę mažinti bendrųjų universiteto studijų dalykų ir kitų netelekomunikacinių dalykų skaičių. Jų vietoje galima būtų dėstyti Belaidžio ir optinio ryšio technologijų kursus. Apgalvokite Multimedijos komunikacijų dalyko įtraukimą. Pakeiskite kai kurių programos kursų pavadinimus, siekiant išskirti jų turinius.

### Personalas

Personalas užtikrina aukštą akademinį lygį. Studijų programą vykduojantys darbuotojai atitinka teisinius reikalavimus. Dėstytojų/studentų santykis yra labai geras.

Darbuotojai turėtų daug aktyviau dalyvauti tarptautinėse stažuotėse ir naujausių mokslinių tyrimų veiklose.

### **Priemonės ir mokymosi ištekliai**

Vienam studentui tenkanti erdvė ir atitinkamos mokymosi sąlygos yra pakankamai geros, kad galėtų užtikrinti patogią mokymosi aplinką.

Reikėtų pasistengti aprūpinti laboratorijas naujausia technologine įranga.

### **Studijų procesas ir studentų vertinimas**

Studentų priėmimo reikalavimai yra gerai pagrįsti. Aukštojo mokslo mokykla užtikrina reikiamą akademinės ir socialinės paramos lygį. Be to, studentų vertinimo sistema yra aiški, tinkama ir viešai prieinama.

Reikėtų dėti dideles pastangas, siekiant įtraukti studentus į tarptautines mobilumo programas.

### **Programos valdymas**

Vidaus kokybės užtikrinimo priemonės atrodo esančios veiksmingos ir efektyvios. Naudojama daug praktinių telekomunikacinių studijų kokybės užtikrinimo metodų. Informacija ir duomenys apie programos vykdymą yra reguliariai renkami ir analizuojami.

Reikėtų dėti didžiules pastangas, kad studentai ir absolventai būtų įtraukti į personalo veiklų vertinimą.

## **III. REKOMENDACIJOS**

### **Studijų turinio struktūra**

1. Būtų naudinga įtraukti tokius kursus kaip Optinės ir Multimedijos komunikacijas į programą.
2. Apsvarstyti galimybę pašalinti Chemijos, Žmogaus saugos, Scenarijų programavimo, Mechatronikos įrangos dalykus ir juos pakeisti kursais, daugiau koncentruotais ties Belaidžio ir Optinio ryšio technologijomis. Apgalvoti Multimedijos komunikacijų dalyko įtraukimą.
3. Apsvarstyti kai kurių programos kursų pavadinimų keitimą, siekiant išskirti jų turinį. Būtent, Telekomunikacijų teorijos, Telekomunikacijos sistemų programinės įrangos ir Įrangos į telekomunikacijos inžineriją dalykų pavadinimus.
4. Apgalvoti Kurso 1 ir Kurso 2 pavadinimų keitimą, siekiant išskirti jų turinius.
5. Patariama suderinti didelį skaičių kursų, susijusių su programine įranga (Programavimo kalba C, Programavimo kalba C++ ir Scenarijų programavimas, Telekomunikacijos sistemų programinė įranga), dėmesį sutelkiant ties telekomunikacijų domeno poreikių tenkinimu.
6. Studijų turinį galima patobulinti, persvarstant skirtumą tarp dviejų programos specialybių (Telekomunikacijų technologijų ir Telekomunikacijų vadybos), kuris šiuo metu yra per mažas.
7. Nuo pirmų mokslo metų galima būtų įtraukti specialius specialybės kursus.

### **Personalas**



1. Reikėtų stipriai pasistengti, kad fakulteto personalas vyktų į tarptautinius universitetus ir tyrimų institucijas.
2. Reikėtų dėti dideles pastangas, kad didesnis skaičius fakulteto personalo dalyvautų pažangiausių mokslinių tyrimų veikloje.
3. Reikėtų imtis priemonių, skatinančių dėstytojų aktyvesnį dalyvavimą ERASMUS mobilumo programoje.
4. Reikėtų skatinti pastangas stiprinti anglų kalbos mokymą.

#### **Priemonės ir mokymosi ištekliai**

1. Reikėtų dėti dideles pastangas, kad laboratorijos būtų aprūpintos naujausia įranga.
2. Reikėtų pasistengti padidinti kursų metu naudojamų angliškų vadovėlių skaičių.
3. Reikėtų dėti dideles pastangas, kad visa įmanoma mokymo medžiaga būtų patalpinta į universiteto virtualią švietimo aplinką Moodle.

#### **Studijų procesas ir studentų vertinimas**

1. Reikėtų pasistengti įtraukti studentus į personalo vykdomas mokslinių tyrimų veiklas.
2. Reikėtų dėti dideles pastangas, siekiant įtraukti studentus į tarptautines mobilumo programas.

#### **Programos valdymas**

1. Reikėtų dėti didžiules pastangas, kad studentai ir absolventai būtų įtraukti į personalo veiklų vertinimą.