STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO TECHNOLOGIJOS UNIVERSITETAS
STUDIJŲ PROGRAMOS
ELEKTRONIKOS INŽINERIJA
(VALSTYBINIS KODAS – 612H61002)
VERTINIMO IŠVADOS

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EVALUATION REPORT
OF *ELECTRONICS ENGINEERING*
(STATE CODE – 612H61002)
STUDY PROGRAMME
AT KAUNAS UNIVERSITY OF TECHNOLOGY

Grupės vadovas: Team Leader:	Prof. dr. Edmund Handschin
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Išvados parengtos anglų kalba
Report language - English

Vilnius
2011

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	Elektronikos inžinerija
Valstybinis kodas	612H61002
Studijų sritis	Technologijos mokslai
Studijų kryptis	Elektronikos ir elektros inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	nuolatinės (4), ištęstinės (5)
Studijų programos apimtis kreditais[1]	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Elektronikos inžinerijos bakalauras
Studijų programos įregistravimo data	1997-05-19, Nr. 565 LR Švietimo ir mokslo ministro įsakymas „Dėl aukštojo mokslo studijų programų įregistravimo".

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INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	Electronics Engineering
State code	612H61002
Study area	Technological Sciences
Study field	Electronic and Electric Engineering
Kind of the study programme	University studies
Level of studies	First
Study mode (length in years)	full-time (4), part-time (6)
Scope of the study programme in national credits	240
Degree and (or) professional qualifications awarded	Bachelor of Electronics Engineering
Date of registration of the study programme	1997-05-19, decree No. 565 by Minister of Education and Science of the Republic of Lithuania „On registration of higher education programmes"

Studijų kokybės vertinimo centras

CONTENTS

I. INTRODUCTION

The evaluation report is based on the self-assessment report (SER) composed under coordination of Assoc. prof. Dr. Žilvinas Nakutis from the Department of Electronic and Measument Systems, and by the team consisting of Prof. Dr. Hab. Algimantas Valinevičius, the Dean of the Faculty of Telecommunications and Electronics; Prof. Dr. Vytautas Dumbrava, the Head of the Department of Signal Processing; Assoc. prof.. Dr. Vytautas Knyva, the Head of the Department of Electronic and Measurement Systems; Assoc. prof. Andrius Chaziachmetovas from the Department of Signal Processing; Mr. Gediminas Stankaitis, the Director of Skaitmeninis kodas ir Ko, Ltd.; and Mr. Dovydas Rušinskas, the student member of the self-evaluation team. This evaluation report covers the 1st cycle study programme titled *Electronic Engineering* (State code: 612H61002) offered by Kaunas University of Technology (KUT).

A previous evaluation of study programme was carried out on Tuesday, November, 8 in 2011 by a group of experts formed by the Centre for Quality Assessment in Higher Education. The members of the evaluation group were Prof. dr. Edmund Handschin (chairman), Prof. dr. Laszlo Koczy, Prof. dr. Toomas Rang, Prof. dr. Anthony Vickers, Prof. habil. Dr. Juozas Vaitkus, and Mr. Mindaugas Karaliūnas. The recommendations of the 2011 review are summarized in appendix 5.5 of the SER.

The EE study programme under analysis is registered in the Register of study and educational programs by the Order No. 565 of 19 May 1997 of the Minister of Education and Science of Republic of Lithuania. In 20 March 2012 the study programme was accredited until 1st of September 2014 by the order SV6-12 of Director of Centre for Quality Assessment in Higher Education. The SER states that the KUT Telecommunications and Electronics faculty is in the process of merging with KUT Electrical and Control Engineering faculty. The project aiming to improve study quality in the above mentioned faculties was launched in 2010/06/09 and is planned to be finished on 2014/02/28.

The on-site evaluation of the Electronics Engineering (BA) programme took place at KUT on Monday, April 28. All decisions concerning the final accreditation report have been taken unanimously by the entire team.

Abbreviations:
      SER   Self-evaluation report
      BA   Bachelor
      KUT   Kaunas University of Technology

II. PROGRAMME ANALYSIS

1. *Programme aims and learning outcomes*

Preparation of higher education specialists in electronics engineering (EE) has crucial importance for the Lithuanian new industry. During the next decade the need for highly qualified electronics engineers duplicates probably in 2020. But still the need of specialists in EE differs from the situation in development curve of IT specialists. Namely, the needs for extremely highly qualified engineers in EE does not need so rapid increase in such a small country like Lithuania and therefore the quality demands for study programme should be very highly specified and carefully followed, and the in-depth knowledge and creative thinking is required from the graduates. An international orientation of the syllabus is mandatory in order to satisfy the future requirements of specialists in the field of EE. To close the gap between theory and practical applications requires innovative and creative thinking and well equipped laboratory base.

The aims of the study programme are clearly stated and linked to the Lithuanian development prospectus (Resolution No.1270 of 22 November 2005". The aims have been linked to the Dublin Descriptors. Access to the programme aims and key learning outcomes is through the KUT website. The information is accessible to the public. The programme aims are – as stated in the SER point 27 – broad, especially when compared to the other 5 different study programs of the merged faculty that have clear narrow focuses. So the students can select between more general or more specified areas of engineering by choosing the fitting programme. The study programme is based on a clear modular description of the learning contents, but there is missing a good explanation for the situation described on SER point 26, where the correlation between the study programme number, their learning outcomes and the structure of the industry has been explained very weakly.

The programme level learning outcomes are arranged using the EUR-ACE methodology. These are knowledge and understanding, intellectual abilities, practical abilities and skills, and transferable abilities and skills. The learning outcomes are listed in the table 5 and the understanding of the categories has been improved strongly compared to the results, which were presented and discussed during the three years ago made remarks in the evaluation report. There is good coverage of the programme learning outcomes across the modules and each module covers a good range of programme learning outcomes. The programme aims and learning outcomes are publicly available in both Lithuania and English through various websites. The degree programme catalogue is of a very high standard, and it is noted that KUT are an ECTS label holder. The consistency of the programme with the stakeholders needs is strengthened. The name of the programme, its learning outcomes, content and qualifications offered are all compatible with each other. The recommendations made by the previous evaluation team, are taken into account and fully implemented.

The KTU EE BA study programme aims and learning outcomes are basing on a clear modular description of the learning contents. The aims and learning outcomes of the study programme are publicly available and there is good coverage of the programme learning outcomes across the modules and each module covers a good range of programme learning outcomes. The recommendations made by the previous evaluation team, are taken into account and fully implemented.

One minor weak point could be named that there were observed small inconsistency between the aims of the programme listed in the SER and the spectrum of the industry in the country. Also the learning outcomes could be more sufficiently communicated to the students.

2. Curriculum design

The programme is consistent with the KUT academic regulations. The programme consists of 240 ECTS credits over 4 years for full time students and 6 years for part time students. The programme has a rich study plan giving both the core electronic engineering study as well as breadth through subjects such as philosophy and free electives. The balance of modules across the semesters and the development of the study programme from the first to the final year are appropriate and consistent with the type and level of studies. The programme learning outcomes are clearly associated with each module and each module has a very clear set of module learning outcomes. The final degree project is a 12 ECTS credit module and the final year project students are encouraged to publish their work through student conferences. An annual exhibition showcases the most successful projects.

The table 7 in SER describes the detailed structure of the curriculum. The weekly face-to-face hours (contact hours, "academic hours") for different courses are detailed into Lectures, Practices and Laboratories for them, but in the SER it is not explained, how the different credits and weekly hours match with each other, e.g. many courses give for the different hours the same number of credits (Philosophy gives 6 credits for 64 contact hour, but in the same time Fundamentals of Information Technologies it gives the same number of credits 6 for 80 hours, etc.). So, therefore it was difficult to understand presented information. In the description of Study Subjects (Appendix 1) this is broken down to the teaching steps of each Study Subject (Module) including expected home work. There is some irregularity in volume of different study modules which is not explained, e.g. 6 ECTS have a range of 40 to 80 contact hours.

Strengths and weaknesses of the programme structure are described in the SER. The evaluation team evaluates positively the taken measures. For example several initiatives have been launched and running outside the faculty that could help improving the forecast of the study programme graduates demand and communication with social partners and graduates. These are national map of professional qualifications run by the Lithuanian Government and the development of Quality Assurance System at the KTU. The feedback and comments gathered by the self-evaluation team was distributed among the study programme teachers which hopefully will stimulate them to address mentioned issues in their subjects.

Also it can be seen that recommendations made by previous evaluation team have been elaborated and in major cases implemented as well; e.g. during the previous study programme evaluation the social partners stressed a lack of practical skills of programme graduates. Experts of the previous evaluation also recommended to (Recommendation 5) embed more practical skill development throughout the study programme. Meanwhile the scientific-like approach has been developed to clarify which practical skills are expected by the industrial employers to be more precisely needed to be included into study programme (the company specialists' quiz helped to elaborate the statistics based mathematical formulae) for improving the practical and communication skills of young employees. Also a wider range of practical skills requires reviewing content of subjects of study programme, and where appropriate, in laboratory work, tutorials and lectures to add additional assignments related with practical engineering activity, and, if possible, to replace a standard laboratory work by practical assignment. It is expected to cooperate more closely with partners from the industry in the selection of topics for students' final projects. Besides that, it is expected to invite experts from industry to deliver lectures for students about perspectives in EE and technology.

The new faculty has many ways in which the study programme is reviewed and modified but it might consider having a clearly identified leadership in this activity, which will take a general overview of the study programme and ties together all the issues. Optimizations should be made in two directions: implementing a study subject "systems theory" to cope with

the aim of broad engineering capabilities and on the other hand a study subject for more and further reaching analogue electronic skills to satisfy the incredibly rising demands due to missing education in this field over the last decades.

It is important to stress the strength sides of the curriculum, which manifests that the programme has well developed study plan giving both the core electronic engineering study as well as breadth through subjects such as philosophy and free electives. The programme learning outcomes are clearly associated with each module and each module has a very clear set of module learning outcomes. The final year project students are encouraged to publish their work through student conferences.

To overstep the problems of concerning the identity and content of mathematics and physical sciences courses the first concrete steps are planned, e.g. on base of polling lecturers the content changes based on the obtained results the programme curriculum could be modified.

3. Staff

Based on the information provided in the SER, it can be assessed that the legal requirements to the staff providing the BA study programme are met. The qualifications of the teaching staff are adequate to ensure the learning outcomes.

There are a number of regulations concerning teaching staff and their training. Teaching staff qualifications are certified every 5 years through a procedure described by Senate Resolution N0.56 of 25 November 2009. The student: staff ratio is governed by the "Rules of pedagogical work accounting" approved by the Order No.A-478 of 31 August 2009.

Each professor or associate professor must teach a minimum of 30 hours per academic year. Full time doctoral students teach a minimum of 90 hours per year. This load is reduced from their supervisors load. The annual pedagogical workload of lecturers is 700-800 hours. It should be noted, that this level of loading does not leave much opportunity for scholarly activity and research.

There has been strong change in age structure of academic staff criticized by the previous evaluating team. The age structure is more or less in balance now. However, the mobility of academic staff is still rather low related to research and Erasmus Exchange, and also concerning participation at the conferences abroad.

Evidence is provided (list of the research projects in SER Appendix) regarding the increase of the R&D activities among of the academic staff, which is the fulfilling of the one recommendation of previous evaluation team. The measures of up-grading of knowledge of foreign language (English) amongst the academic staff have been taken (recommendation of the previous evaluation team).

The previous evaluation report stressed two strong weaknesses concerning staff, e.g. research activities were very unequally distributed in the teaching staff; and the knowledge of foreign language (English) amongst the academic staff was varied, which could in opinion of previous evaluation team hinder their use of English based texts when preparing material for students. Also there was an indication on age problems of the staff as well. The first and lastly named weaknesses is clarified, e.g. there is a clear policy for appointing new members of staffs and retiring procedure is clear, and the research volume and measures for up-grading of English knowledge of the academic staff have been taken and the results are already seen.

Unfortunately the mobility activities are unequally distributed among the teaching staff and there is still too low International activity related to research and Erasmus Exchange (depends on the agreements that are signed between the universities). For example during 2010-2013 every year only one member of academic staff has visited the foreign institution (all

together 5 persons have participated) and only 3 visiting academicians have been accepted by faculty/department.

4. Facilities and learning resources

Evidence is provided to indicate that the facilities and equipment provided for the students on this study programme is appropriate to the level of the programme. There is a plan in place for further updating and expansion as part of the planned merger of three faculties. On base of SER the significant renewal of teaching/training and research premises have been done (e.g. table 17, page 25). Some positive examples could be named in the upgrading of the study laboratories, e.g. UMTS and other mobile network laboratory, Mobile WIMAX systems laboratory, Satellite navigation laboratory, Laboratory of Micro-/nano-technologies, Electronic Laboratory, etc.). Also some new teaching laboratories have been initiated, like Electrical measurements laboratory, Design and experimental laboratory, Biomedical engineering laboratory, etc.

The access to hobby and developmental laboratories are good examples of how the students are stimulated to be creative. Students indicated that they would prefer more access to facilities out of normal working hours.

The students have access to a well provisioned library as well as online access to databases (e.g. KTU Library has a well-organized web page, which allows students and teachers to use subscribed and tested databases. The accesses to foreign databases are available from KTU computers or through VPN network at home. Databases include: Cambridge Journals Online, Ebrary, EBSCO Publishing, Emerald Engineering eJournals Collection, IEEE Xplore, IOP (Institute of Physics) Electronic Journals, ISI Web of Knowledge, LITLEX-Internet, Morgan & Claypool, Nature.com, Oxford Journals, SAGE Journals, ScienceDirect, Science Online, SpringerLINK, SpringerLINK E-Books, e-books published by VGTU, Wiley Online Library, Zentralblatt MATH (full list at http://biblioteka.ktu.edu/db/default1.htm) through the library website. There are also course books available to students in the Departments. Coursework material produced by teaching staff is available by a variety of methods.

The university has during the last three years, as the site visit also showed, renewed premises for teaching/training and research, which are available for both students and academic staff (fulfillment of recommendation of previous evaluation team). The access to development and hobby laboratories is to be applauded, and the students do have access to some highly specialized experiment equipment, faculty (e.g. the research labs with high quality experimental equipment at the Ultrasound Science Institute, Institute of Metrology, Biomedical Engineering Institute). For the evaluation team it is clear that for the BA level studies these high quality level research labs are exception neither the usual approach in study process.

5. Study process and student assessment

The admissions requirements are "twelve years secondary or equivalent education in any other country than Lithuania". Students are admitted with a range of competition grades. In 2010 the range was from 19.96 to 12.14. Teaching staff and current students are involved in encouraging secondary school students to undertake the bachelor degree programme in Electronic Engineering through for example Open Days and KUT Radio club.

Timetabling of student study programmes is designed to give an even spread of workload and to allow time to arrive promptly at study events. Coursework and examinations are also timetabled to give a balanced load. Students are only allowed to sit examinations if they

have successfully completed the semester tasks. There are examination reset opportunities for students who have failed less than half of the credits of the semester.

Student dropout rates have become relatively low in recent years with the largest rate being experienced in the first year (12% of full time students in 2010). The dropout rates for part time students are generally higher at around 15%. Steps have been implemented to reduce the dropout rates at the end of the first year. These include removing complicated material from the first year, introduction of supplementary mathematics modules, monitoring of attendance and progression through the semester, and the introduction of academic group tutors.

Most of the students are able join the scientific activity projects of the teaching staff. Their work and results are promoted in the exhibition of young scientist's projects "Technorama".

Table 23 on page 31 in SER shows the turnover of students in all study programs under EE study field. As the full time studies groups are big enough there is a difficulty to match the full time and the part time studies schedule because they has to fit to the existing lectures or study themselves.

Students have access to mobility (3-12 months) through the Erasmus programme. Unfortunately like the staff the international mobility is low among the students, which has not changed during the years passed after the previous evaluation three years ago. Students are selected on a competitive basis. However there is still a lack of motivation to go abroad amongst students. The SER team reported that students found difficulty in gaining the full credits for a mobility period. As it was clarified on-site visit, that the finding of partners is still a problem for the Erasmus Exchange. Also another familiar problem has not disappeared: some of the full time students are working, and therefore they are not available for mobility programmes. In general it seems that there is little motivation amongst the students to participate in Erasmus programme.

Information to students is published in a variety of forms including a number of web sites. There are a variety of means by which students can seek advice and request consultations. There is a series of induction events for 1st year students which are aimed at familiarizing students with all aspect of University life. In 2009 the Academic Support Centre opened. The Centre provides a range of support regarding intellectual, talent, personality development as well as assistance with learning difficulties. Information is provided to students through the use of email, websites and Moodle. As for the extra curricular activity, it can be noted that the students have access to a wide range of sports and arts groups.

Student representation is through the Student Union. Students are represented on all main decision making bodies within the Faculty, including the study programme committee. There is no student representation at Departmental Meetings. This was discovered last time and the students still do not have an official student representative there. But, as it came out on meeting with the student representatives, the departmental meetings do more of an administrative work and the student representative union does not see a problem with that.

There are a number of means by which students can seek financial support from KUT. The arrangements are governed by a number of published Decisions. There are also state financed motivation scholarships for both state financed and self-financed students. Dormitory accommodation is available to students who are not resident in Kaunas city.

During the meeting with the students on-site, they clarified that the students are mostly satisfied with the study process, it was said that the work load is consistent and appropriate and the students receive clear information regarding the assessment criteria and clear feedback of that assessment. The use of project work through most of the programme engages the students with the subject and encourages creativity and there are good mechanisms in place to assist students experiencing difficulties in the first year. The previous evaluation team recognized that the faculty should consider a clear strategy on plagiarism. As the site visit proofed, in the final work

there was a document related to a guarantee that all data are correct and every other data are cited. The student representative union is involved in the work against plagiarism, so the whole university has a policy against plagiarism.

6. Programme management

The management of the programme is carried out in accordance with the relevant Statute of KUT. An appropriate responsibility chain exists for the approval, administration and quality assurance of the programme. Within a Faculty study programs are monitored by the Study Programme Committee (SPC) which acts under relevant regulations to oversee the quality assurance of the programme. The membership of the SPC includes the Dean of the Faculty (Chair), heads of the four departments, a social partner, a student representative and one other. SPC develops any renewal proposals and presents these to the Faculty Council. After gaining Faculty Council approval the SPC submits proposals to the Study Office, which provides summarized proposals to the Rector and Vice-Rectors, and Senate for final approval. Information regarding the quality assurance processes is made available through LiveLink environment.

Study programmes are renewed by academic staff on a compulsory basis every three years. Minor changes are implemented on an annual cycle. Academic staff is assessed every 5 years by an Assessment and Competitions Commission (ACC) which is also responsible for running the competitions for open positions.

Student online surveys of modules are organized at the end of each semester. The results of the surveys are discussed by the Faculty SPC, the Faculty ACC and the Faculty Administration responsible for assessing the teachers work. General information from the surveys is made public.

Departmental meetings are used to discuss matters of quality assurance, such as exam results and quality of final degree projects. These matters are also discussed by the Dean's office and the Faculty Council. However the overall chain of responsibility regarding quality assurance and how transparent the process is to all teaching staff, students, and stakeholders is not clear.

Social partners are also involved in the quality assurance through formal/informal mechanisms; however relations these need to be strengthened as indicated by the SER team.

The programme management is well developed. There is a clear policy for appointing new members of staffs and retiring procedure is clear. There is a good awareness for the necessity to merge and combine different faculties and study programs. The budget of the faculty is a good basis for its further developments.

Mainly, as it was mentioned in the study process area, some critical words should be said to the internationalization strategy with respect to teaching and mobility. Also the knowledge of the graduates is not fully used by the University for the future development of the study programme.

Regarding the Academic/Professional/Public/Labor Market needs, general evidence is clearly provided to support the need for Electronic Degree programmes in Lithuania. University representatives at the level of the Dean's office and the Faculty Council organize meetings with representatives of the electronics industry regarding the needs of professional in this area. The meetings are held within the "KUT Career Days" organized by the KUT Career Centre. There is also an annual meeting with stakeholders to discuss the needs of young professionals organized by the Faculty Council.

III. RECOMMENDATIONS

Comparing the recommendations from the previous evaluation report the undertaken efforts by the KTU new faculty has been improved many of them, but some recommendations are valid still today. Unfortunately some of them conclude directly from the under financing of the higher education generally. The evaluation team agreed to give in following recommendations:

1. Continuously ensure that all staff has the ability to undertake scholarly/research activity at an international level, in particular through publishing and operating a clear policy on scholarly/research activity and give some consideration to establishing a supportive annual monitoring of the scholarly/research activity of academic staff;

2. Adopt permanently a more proactive approach to internationalization through student mobility and the inclusion of guest teachers, using the Erasmus programme. Develop a strong set of appropriate partners through the Erasmus programme;

3. Consider adopting a strategy for increasing the use of English within the curriculum.

IV. SUMMARY

The KTU EE BA study programme aims and learning outcomes are basing on a clear modular description of the learning contents. The aims and learning outcomes of the study programme are publicly available and there is good coverage of the programme learning outcomes across the modules and each module covers a good range of programme learning outcomes. The recommendations made by the previous evaluation team, are taken into account and fully implemented. One minor weak point was observed in a small inconsistency between the aims of the programme listed in the SER and the spectrum of the industry in the country. The evaluation team evaluates positively the taken measures. For example several initiatives have been launched and running outside the faculty that could help improving the forecast of the study programme graduates demand and communication with social partners and graduates. These are national map of professional qualifications run by the Lithuanian Government and the development of Quality Assurance System at the KTU. The recommendations made by previous evaluation team have been elaborated and in major cases implemented as well.

The previous evaluation report stressed two strong weaknesses concerning staff, e.g. research activities were very unequally distributed in the teaching staff; and the knowledge of foreign language (English) amongst the academic staff was varied, which could in opinion of previous evaluation team hinder their use of English based texts when preparing material for students. Also there was an indication on age problems of the staff as well. The first and lastly named weaknesses is clarified, e.g. there is a clear policy for appointing new members of staffs and retiring procedure is clear, and the research volume and measures for upgrading of English knowledge of the academic staff have been taken and the results are already seen. Unfortunately the mobility activities are still quite unequally distributed among the teaching staff and there is still rather low International activity related to research and Erasmus Exchange.

The programme management is well developed. There is a clear policy for appointing new members of staffs and retiring procedure is clear. There is a good awareness for the necessity to merge and combine different faculties and study programs. The budget of the faculty is a good basis for its further developments.

On base on results of discussions and meeting during the onsite visit the evaluation team found strong improvement in application of study programme compared with the situation, what some of our evaluation team has seen at the previous evaluation. Also clear steps for administrative changes for creating the optimum structure of the faculty has been taken for. All these important steps together with the new adopted faculty development plan and improved financial situation at the university generally gives us the possibility the KTU bachelor study programme on Electronics Engineering (state code – 612H61002) has strengthened in many aspects, especially in active involvement of students in research activities of the teaching staff, in upgraded study facilities and successful activities in the field of embedded systems teaching and training as compared to the previous review.

The most important conclusion from the previous recommendations has been drawn by the leadership of the faculty: new and more optimal faculty structure has significantly improved the merged activities between departments. The last structural change probably helped the new leadership of the faculty much easily to implement almost all the recommendations made by the previous evaluation team in 2011.

Parallel to all positive emotions the evaluation team found some weaknesses from which we stress the following ones: some of the laboratory work is not challenging enough and the mobility of students and some teachers is not sufficient. Although the programme management is well organized, the implementation of necessary changes is not yet adequately guaranteed and the intended learning outcomes are not sufficiently communicated to the students. Especially the evaluation team wants to stress that the number of publications in international journals should be increased and a one semester industrial internship should be introduced into the BA study programme as soon as possible.

IV. GENERAL ASSESSMENT

The study programme *Electronics Engineering* (state code – 612H61002) at Kaunas University of Technology is given **positive** evaluation.

Study programme assessment in points by fields of assessment.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
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
	Total:	**18**

*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. dr. Edmund Handschin

Grupės nariai:
Team members: Prof. dr. Toomas Rang

                     Prof. dr. Tilman Krüger

                     Prof. habil. dr. Juozas Vaitkus

                     Paulius Simanaviĉius

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V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno technologijų universiteto studijų programa *Elektronikos inžinerija* (valstybinis kodas – 612H61002) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	**18**

* 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

KTU Elektronikos inžinerijos bakalauro studijų programos tikslai ir studijų rezultatai pagrįsti aiškiais studijų turinio modulių aprašymais. Studijų programos tikslai ir studijų rezultatai yra viešai skelbiami ir studijų programos studijų rezultatai yra tinkamai įtraukti į modulius, o kiekvienas modulis apima labai įvairius studijų programos studijų rezultatus. Atsižvelgta į praeitos ekspertų grupės pateiktas rekomendacijas ir jos visiškai įgyvendintos. Pastebėtas vienas nedidelis trūkumas – nedidelis neatitikimas tarp savianalizės suvestinėje nurodytų studijų programos tikslų ir pramonės spektro šalyje. Ekspertų grupė teigiamai vertina priemones, kurių buvo imtasi. Pavyzdžiui, už fakulteto ribų pradėtos ir vykdomos kelios iniciatyvos, kurios galėtų padėti gerinti studijų programos absolventų paklausą ir ryšius su socialiniais partneriais bei absolventais. Tai yra Lietuvos Vyriausybės nacionalinė profesinių kvalifikacijų sandara ir Kokybės užtikrinimo sistemos sukūrimas KTU. Ankstesnės ekspertų grupės pateiktos rekomendacijos buvo išanalizuotos ir daugeliu atveju taip pat įgyvendintos.

Praeitos ekspertų grupės išvadose pabrėžti du pagrindiniai trūkumai, susiję su personalu, t. y. labai nevienodas tyrimų pasiskirstymas tarp dėstytojų ir skirtingas akademinio personalo užsienio kalbų (anglų) žinių lygis. Ankstesnės ekspertų grupės manymu, tai galėjo kliudyti naudoti angliškus tekstus rengiant medžiagą studentams. Taip pat buvo nurodyta personalo amžiaus problema. Pirmasis ir paskutinis trūkumai buvo aiškiai pašalinti, t. y. laikomasi aiškios politikos priimti naujus darbuotojus, o išėjimo į pensiją tvarka taip pat aiški, imtasi priemonių tyrimų apimtims didinti bei akademinio personalo anglų kalbos žinioms gilinti

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ir jau matomi rezultatai. Deja, su dėstytojų mobilumu susijusi veikla tebėra gana netolygiai paskirstyta, o su tyrimais ir *Erasmus* mainais susijusi tarptautinė veikla – gana neaktyvi.

Studijų programos vadyba – išplėtota. Laikomasi aiškios politikos priimti naujus darbuotojus, o išėjimo į pensiją tvarka – aiški. Puikiai suvokiama, kad reikia susieti ir sujungti skirtingus fakultetus ir studijų programas. Fakulteto biudžetas – geras pagrindas jo tolesniam plėtojimui.

Iš diskusijų ir susitikimų vietoje rezultatų ekspertų grupė suprato, kad studijų programa tapo gerokai patobulinta palyginti su tuo, ką savo vertinime nustatė praeita ekspertų grupė. Taip pat imtasi aiškių veiksmų, skirtų administraciniams pokyčiams atlikti, kad fakulteto struktūra būtų optimali. Dėl visų šių svarbių veiksmų ir naujo fakulteto plėtros plano, taip pat geresnės viso Universiteto finansinės situacijos iš principo buvo sudarytos sąlygos stiprinti įvairius KTU Elektronikos inžinerijos bakalauro studijų programos (valstybinis kodas – 612H61002) aspektus, ypač aktyviai įtraukiant studentus į dėstytojų mokslinę veiklą, atnaujinant studijoms skirtas patalpas ir sėkmingai vykdant veiklą įterptinių sistemų dėstymo ir mokymo srityje palyginti su praeitu vertinimu.

Fakulteto vadovybė pasinaudojo svarbiausia praeitų rekomendacijų išvada: nauja ir optimalesnė fakulteto struktūra gerokai patobulino sujungtą katedrų veiklą. Paskutinis struktūrinis pokytis, tikriausiai, padėjo naujiems fakulteto vadovams gerokai lengviau įgyvendinti beveik visas praeitos ekspertų grupės rekomendacijas, pateiktas 2011 m.

Be teigiamų dalykų, ekspertų grupė nustatė trūkumų, iš kurių norėtume pabrėžti šiuos: kai kurie laboratoriniai darbai nėra pakankamai sudėtingi, o studentų ir kai kurių dėstytojų mobilumas nepakankamas. Nors studijų programos vadyba gerai organizuota, būtinų pokyčių įgyvendinimas dar nėra tinkamai užtikrintas, o studentai negauna pakankamai informacijos apie siektinus studijų rezultatus. Ekspertų grupė nori ypač pabrėžti, kad reikia didinti publikacijų tarptautiniuose žurnaluose skaičių ir į bakalauro studijų programą kuo greičiau įtraukti vieną semestrą praktikos.

III. REKOMENDACIJOS

Žiūrint į praeito vertinimo išvadose pateiktas rekomendacijas, naujasis KTU fakultetas stengėsi daugumą jų įgyvendinti, tačiau kai kurios rekomendacijos lieka galioti ir šiandien. Deja, kai kurių jų pagrindas – bendrai nepakankamas aukštojo mokslo finansavimas. Ekspertų grupė teikia šias rekomendacijas:

1. Nuolat užtikrinti, kad visas personalas turėtų galimybę vykdyti mokslinę veiklą ir (arba) tyrimus tarptautiniu lygiu, ypač skelbiant ir įgyvendinant aiškią mokslinės veiklos ir (arba) tyrimų politiką, ir apsvarstyti galimybę pradėti metinę palaikančią akademinio personalo mokslinės veiklos ir (arba) tyrimų stebėseną;

2. Nuolat aktyvinti tarptautiškumą, didinant studentų mobilumą ir įtraukiant atvykstančius dėstytojus pagal *Erasmus* programą. Sukurti stiprų tinkamų partnerių tinklą per *Erasmus* programą;

3. Apsvarstyti galimybę patvirtinti strategiją, skirtą anglų kalbos vartojimui studijų programoje didinti.

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