



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS  
KAUNO TECHNOLOGIJOS UNIVERSITETO  
**STUDIJŲ PROGRAMOS**  
*Elektros energetikos inžinerija (621H63003)*  
**VERTINIMO IŠVADOS**

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**EVALUATION REPORT**  
**OF *Electrical power engineering (621H63003)***  
**STUDY PROGRAMME**  
at ***KAUNAS UNIVERSITY OF TECHNOLOGY***

Grupės vadovas:  
Team leader:

Prof. dr. Krzysztof Kozlowski

Grupės nariai:  
Team members:

Prof. dr. Lyudmila Zinchenko

Dr. Olev Martens

Dr. Rolandas Urbonas

Paulius Simanavičius

Išvados parengtos anglų kalba  
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## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Elektros energetikos inžinerija</i>
Valstybinis kodas	621H63003
Studijų sritis	Technologijos mokslų studijų sritis
Studijų kryptis	Elektronikos ir elektros inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Antroji
Studijų forma (trukmė metais)	Nuolatinė (2 metai)
Studijų programos apimtis kreditais	120 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Elektros inžinerijos magistras
Studijų programos įregistravimo data	2002-06-14, Nr. 1093

## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Electrical power engineering</i>
State code	621H63003
Study area	Technological sciences
Study field	Electronics and electrical engineering
Kind of the study programme	University Studies
Study cycle	Second
Study mode (length in years)	Full-time (2 years)
Volume of the study programme in credits	120 ECTS
Degree and (or) professional qualifications awarded	Master of Electrical Engineering
Date of registration of the study programme	06-14-2002, No. 1093

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The Centre for Quality Assessment in Higher Education

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## I. INTRODUCTION

The Kaunas University of Technology is one of the biggest technical universities in Lithuania with about 12000 students, 13 faculties and 73 departments. The mission of the university is to provide high level studies and research opportunities at international level suitable for a sustainable development and growth of the country. The Kaunas University of Technology is an active member in many international organizations and participates regularly in a variety of scientific research and educational international programmes.

The academic program under evaluation Master of Science (MSc) in Electrical Power Engineering (EE) is a program offered by the Faculty of Electrical and Control Engineering and supervised by the Department of Electrical Power Engineering. In Lithuania only KTU is responsible for this academic program.

Currently the EE program is offered in Full-Time mode with duration of 2 year and it is designed with a structure based on the European directives for Higher Education (Bologna Process). It awards 30 ECTS credits per semester and 60 ECTS per year. This is a 2 years master program with 120 ECTS credits.

The last assessment of the EE program was carried out by an external international committee and took place in 2010. The previous evaluation report was provided.

The present evaluation by an external quality evaluation team took place in two phases, a remote study of the Self Evaluation Report (SER) and an on-side visit to the university. Our evaluation report is based on the Self-Evaluation Report, public materials and by the on-site visit by the Evaluation Team.

Current accreditation took part on March 25, 2014 and it performed by the international panel of experts: Prof. dr. Krzysztof Kozłowski (team leader), Prof. dr. Lyudmila Zinchenko, Dr. Olev Martens, Dr. Rolandas Urbonas, Paulius Simanavičius. The entire team took all decisions concerning the final evaluation report.

### Abbreviations:

SER	Self – Evaluation Report
BA	Bachelor
KUT	Kaunas University of Technology
MA	Master
LO	Learning Outcomes
CD	Curriculum Design

## II. PROGRAMME ANALYSIS

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

The academic content of the programme consist of the following 5 modules: Energetic Systems Analyses, Information Systems in Energy, Reliability and Quality of Power Systems, Electromagnetic Transients Processes and Energy Technologies and Environment plus certain electives. The programme has a deepening character and aims to strengthen the employability of the graduates and provide also the appropriate research foundations to those willing to continue with Doctoral studies.

The programme aims and learning outcomes are well defined and clearly stated. As it is written in the SER the main aim of the program is to provide knowledge and skills in the field of Electrical Power Engineering giving more emphasis in the area of the 5 modules mentioned above. An important goal of the programme is to prepare students for the third cycle studies. The Learning Outcomes (LO) of the program are presented in Table 2.1 of the SER. The LO of each subject are presented and clearly shown in appendix 4.1 as well as the links between the subject and program LO. The subjects LO satisfy all requirements of the program LO. However some of the LO are not appropriately written (example page 54 of the SER). Detailed information regarding the program and subjects LO appears in the webpage of the EE Program.

Mostly the LOs are consistent with the type and level of studies (level 7) and the qualification offered. This can be seen from the information provided in the SER Table 2.1 and Table 2.2. The learning outcomes of the subjects match with all the learning outcomes of the EE program MSc qualification Table 2.2. However, a number of LO is quite high and we hesitate about a feasibility of the program. A number of LO can be merged.

The results of a survey among Lithuanian companies have shown an increasing demand of specialist of the EE program. From another survey among EE program graduates it has been shown that 84% of the graduates work in industry and the 52,4% were employed during their study years and the rest 28,6% - just right after the graduation. 12 (about 10%) continue for doctoral studies. The program LO satisfies very well the academic and professional requirements as well as the needs of the labor market. This was discussed and confirmed by the employers and alumni during the meetings on the site visit.

Based on the SER and the information gathered during the on-site meetings with students, graduates of the programme and social partners the evaluation team endorses that the programme

aims and learning outcomes are consistent with the type and level of studies and the level of qualifications offered.

The evaluation team confirms that the name of the programme, its learning outcomes, content and the qualification offered are compatible with each other. The fact that high competition scores of the admitted to the programme applicants are stable shows the attractiveness of the program. The fact that mainly the EE program applicants are coming from the Kaunas University of Technology shows that KTU BA graduates are confident for this programme. The reason why more students from other universities do not apply for this programme, it was answered by students during onsite meetings, is the fact that in general Lithuanian students prefer to study close to their home cities. It would be encouraging to increase a number of foreign incoming students.

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

According to the SER the Curriculum Design (CD) complies with the national local legislation and the local regulations for the postgraduate programs. More specifically the total volume of the academic and individual work hours of the study subjects and the respective volume of the individual study subjects conform to the legal acts of the University Academic Regulations.

The main characteristics of the academic of the programme are that the EE Program has duration of 2 years (4 semesters) with 120 ECTS, the compulsory subjects do not exceed 5, the program foresees 3 projects, one in the 2nd semester with 6 ECTS, one in the 3rd semester with 12 ECTS and the final project in the 4th semester with 30 ECTS. There are also elective subjects and students can take also a free elective. This is in compliance with the Recommendations 3.2 and 3.1 formulated during the last accreditation. Two existing MA study programmes were terminated and attractive study subjects from these study programmes were incorporated into this two years MA programme. This information cannot be found in the SER but it was confirmed during the on site visit.

From the detailed information about the subjects provided in Appendix 4.1 we may verify that the content of the subjects and /or modules are consistent with the type and level of the studies. The subjects cover at a satisfactory level all engineering fields proposed by the program and include theoretical lectures (in average, 60% of the program), class work and laboratory work (in average, 40%). It is estimated that this distribution of time between theoretical and practical work is appropriate and it is close to the international practice. A minor weakness is

that in many cases the reference books proposed to some subjects consist of quite old books (for example, in appendix A4.1, page 82). A renewal of the reference books is proposed in collaboration with the academic staff.

In the SER appendix 4.1 there is a very informative and detailed list of the subjects. Each subject shows appropriately the link between the LO of the qualification and the LO of the subject. Information also is provided about the syllabus, the assessment methodology, references and grading system. From the information provided it is estimated that the subjects, contents and methods proposed are suitable for the achievement of the intended LO.

The scope of the programme is sufficient to ensure learning outcomes. The content of the programme reflects the latest achievement in science and technologies at a good level. This has been seen during the visits in the laboratories and confirmed by the employers and alumni during the meetings with them. It would be encouraging for MSc students to participate in conferences and publish their research results.

The lecture schedule has been improved according to Recommendation 3.3 from the previous evaluation in 2010. However, more efforts are needed to improve the lecture schedule. Currently the lecture schedule seems to be inconsistent. Some of the lectures start very early in the morning, while others start in the evening. The experts recommend to do survey as to what time of lectures start is most suitable for the students. Based on the results, it would be possible to make the timetable more consistent.

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

Teaching staff who supports the study programme meets all legal requirements. In 2012-2013 the composition of the staff consisting of 6 professors, 8 associated professors and 2 lecturers, all are holders of doctoral degrees, satisfied the legal requirements. In 2014 five members of teaching staff were replaced. Currently teaching staff consists of 3 professors, 10 associated professors and 3 lecturers. All members of teaching staff are holders of doctoral degrees. More specifically the Order of the Ministry of Education and Science requires that not less than 80% should be holders of doctoral degrees and not less of 20% should be professors. Both criteria are satisfied both in 2012, 2013 and after replacement in 2014.

From the information provided in the CVs presented in Appendix 4.3, we may see that the qualifications of the staff conform to the Description of the requirements for Master programmes. The professors and associate professors teaching the main subjects have a

professional experience of more than 10 years and all the professors are involved in the third cycle process. This shows that the staff qualifications are adequate to ensure successfully the target Learning Outcomes.

In the period from 2010 no more than 32 students were admitted to the study programme (see Table 2.5.2 of the SER). It shows that the number of the teaching staff is adequate to ensure learning outcomes. From the information provided by the staff during on-site meetings the contact hours during teaching periods are in average 17 hours per week. This load is high and does not provide enough time to staff for research work and publications. It would be encouraging to decrease teaching load of the staff involved in the MS programme.

Some positive elements are noted regarding the teaching turnover policy applied to the university. A special program will be implemented during the coming years for the additional funding for the departments employing teachers less than 40 years old. In the future a smooth turnover of staff is expected.

The institution supports the professional development of the teaching staff by organising courses, seminars, and other similar events. It also encourages the staff participation in training in other foreign institutions or in industry and it gives also the possibility for improvement of the qualification at least once every five years.

From the information provided in the SER and the Appendix 4.2 (list of lecturers) and 4.3 (CVs) it can be verified that almost all teaching staff is involved in research directly related to EE programme. This can be seen also from the publications of their research results. From the information provided by the SER we noted that a small number of staff participate as partners in international research programs and are members of international professional societies, editorial boards, and evaluation committees. According to the information provided by the staff during the on-site meetings it seems that only a small number of teaching staff has participated in international projects. Some weaknesses have been noted also regarding the international mobility of the staff in general and more specifically in the participation in EU research projects and in publication in high ranking journals, especially abroad.

The activities mentioned above are very important for effective implementation of MS programme and taking in account the number of staff and the number of partnerships the evaluators believe that the total international mobility and non-Lithuanian publications of the staff could be increased, e. g. in IEEE conferences proceedings and IEEE and Springer journals.

It was noted that the number of foreign visiting academic staff is small. It is advised to invite more often if possible visiting lecturers from other universities or industry mainly abroad



to give some specialised courses to students. It is noted that some employers realised that some graduates lack for mobility skills. It is proposed to staff to consider this comment by employers and increase students' mobility to enhance their soft skills.

More efforts at the University level are needed to inform a teaching staff about existing opportunities for funding, research activities, publications, conferences etc.

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

According to the information provided by the SER the number of Audiences (23) (Classrooms (12), Laboratories (9) and computer classes (2)) are adequate in their size and quality and fully meet the study requirements.

From the visit to the various Laboratories the evaluators saw that the available equipment is of high quality and suitable for the needs of the program. This equipment has been provided by companies, e. g. Schneider Electric, and these resources are exploited or will be exploited during the coming semester. As regards the available software it is good. It was noted that the computers are appropriate for the program and that they are equipped with specialised software e.g. PSS/E, POWER WORLD, MATLAB etc. However, as the technology in this field changes quickly it is advised to follow up and update the software needs in the next coming years. Finally it is important to note that it is clearly said that the laboratory equipment, computers and specialised software are constantly renewed. The laboratories development plan is reasonable.

From the information provided by the employers during the on-site meetings it has been seen that practice is well arranged. It is noted that some alumni realised that a gap from University to industry exists. It is proposed to staff to consider this comment by alumni and adapt their practice arrangements accordingly.

The university makes available to students the central library and subsidiary libraries in the Faculties. From the visit on-site the evaluators saw that the library provides to students a rich variety of books, textbooks, periodical publications and databases and the electronic catalogues are accessible from home. For example the library offers electronic access to major scientific data bases like IEEE Xplore. The number of printed books and periodicals although satisfactory could be improved. As regards the references books proposed to students some of them are quite old. For example some of the books in appendix A4.1 page 82. It could be added finally that MS students have easy access in printing and copying or scanning facilities as well as in computers

rooms with suitable software. During the meeting with students almost all of them expressed their satisfaction for all the facilities and learning resources they have available.

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

During the on-site meetings the admission requirements to the programme were clearly explained. The admission regulations for the second cycle programs are published in the university web-side and the admission assessment is organised according to the students' admission rules and is carried out by the University Selection Committee. The ranked competition results are announced in the web side of the University. The assessment consists of examination of the average mark of the BA studies with a weight factor 0.8 and the scientific activities of the candidates with a weight factor 0.2. The information also about the equalisation study program for graduates of professional BA (for example, from Kaunas Technical College) was given. The examination of applications for admission of applicants from foreign universities, as explained during the site visits is done according to Lithuanian regulation rules.

It can be seen that the admission process applied is transparent and it ensures a high quality of applicants. This is shown in Table 2.5 of the SER that shows the competition rank of admitted students from 2007 to 2012. Information about the program is presented in the universities webpage.

The students are very satisfied with the study process and their study program in general. No complains or suggestions for improvement were given regarding the study program or assessment methods. They are particularly satisfied from the fact that the academic program is adapted in way to give them the possibility to work and study at the same time. Although they do not have enough time free because they work, they have easy access to laboratories, computer rooms and libraries during and after universities hours. During on site visit the international panel of experts saw two good examples of students participating in the research projects. They write research papers and participate in the exhibition "Technorama". We understand that it is in compliance of Recommendation 3.5 stating that MA students should participate in research projects carried out in the department. Therefore observed activities are in the right direction strengthening the programme of Electrical Power Engineering.

The Master thesis of students is often related with the local industry research topics and for some students is directly related with their working places. Employers and other stakeholders participate during the assessment of the final thesis. This is very good and should be encouraged, as the study process will overcome possible problems. From the information provided by the

students during the on-site meetings only 2 MS students are interesting for doctoral studies and potentially to join a teaching staff. It was noted a small number of the final thesis subjects is research oriented.

The number of outgoing students is rather low. During the meeting with students it was clearly said that most of the students do not go abroad although they would like to do so because they work and cannot leave their jobs. This is, somehow not in full compliance with the Recommendation 3.4 imposed by the international panel last time (again formally it is visible in the SER). From the SER follow that that during the period of last assessment 4 students from the second cycle took part in the mobility programme. This number is still quite low and besides that two students visited Fachhochschule in Stralsund in Germany. To evaluators opinion it would be more beneficial to visit technical university instead of Fachhochshule, the last being responsible for BA programmes. Here we advise to make the MA programme also stronger at international level. Number of visiting foreign students is low as well. More efforts are needed to increase in the future the number of incoming students from Europe and third countries. Students have a possibility to get a social scholarship from the university. Good performing students have a possibility for the financial stimulation.

The evaluation team endorses that the assessment system is clear for students. It was confirmed during on-site meetings with students. The graduates indicated that they are happy with the content and quality of study programme they have selected. The majority of graduates are either working at the social partners companies or studying at the PhD level study programmes.

No information is provided whether the university participated in international fairs to promote the programme or if alternative methods are used to inform BA graduates of other countries about the existing program. It seems that the promotion of the program is weak. More efforts at the University level would be recommended.

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

The responsibilities for the implementation of the EE programme are clearly described and appropriately allocated. According to information provided by SER the administration of the program is under the responsibility of the Vice Rector for Studies assisted by Studies Office and Studies Quality and Monitoring Office of the Academic Department. As regards the responsibility for specific tasks like the innovation and improvement of the program this is given

to the faculty Study Program Committee (SPC). We may conclude finally that practically the implementation of the program is under the responsibility of the SPC that according to the decisions to be taken collaborates with the Faculty Council. It would be encouraging to include a Professor responsible for the EE Program in the SPC.

According to the information provided by SER the university academic information system exists for the collection of data and for the management of the study program. The data collected are mainly related to final degree projects, statistics for mobility of students and teachers, student's academic record, etc. These data are analysed and used for quality improvement activities. These data is also available in the university webpage.

The internal quality assurance system of the programme is based on the System of internal quality assurance of studies (SIQAS) approved by the University. As a result the content of many programme subjects has been improved according to suggestions of the social partners. Some specific examples have been given. This is a good practice that should be continued. It shows also that the involvement of stakeholders can be very efficient.

Another way to improve the quality of the program is the study of the students' feedback regarding the subjects taught, their teachers' performance and other information about the university. The answers of the students' questionnaires are discussed in the meetings of the various faculty committees and appropriate actions are taken. It is noted that in the questionnaires of the last five years the students assessed positively the lecturers' didactic system, communication of lecturers and students, cooperation in study process. This shows that the internal evaluation outcomes are appropriately used.

The program teachers participate also in the QA improvement activities with discussions in the department meetings. They also keep in contact with employers and international companies in order to obtain information for updating the program subjects. They are also questioning the local companies about their needs in specialised staff in the field of the EE program. An interesting activity is the help of the graduates to teaching staff of department in periodic updating of equipment etc.

The outcomes of the external evaluation are taken into consideration for the improvement of the programme. It confirms by changes in CD, the lecture schedule etc.

Evaluation team confirms that internal quality assurance measures are effective and efficient. Although some positive steps were taken regarding the incoming foreign students the overall internationalisation of the program is still weak. The number of outgoing Erasmus students is rather low, the number of incoming and outgoing teachers is very low and also there

is not enough international collaboration in international programmess. The same applies for the collaboration in international research projects. It is proposed to improve and increase the overall marketing activities like distribution of printing information leaflets and the participation in international educational fairs.

The teaching load of the programme is another weak point as it was mentioned above. The management committees should consider this problem and ask for more funding for employment of more staff. The situation as it is now affects the professional development of the staff, the performance of their work and the overall quality of the learning outcomes.

### III. RECOMMENDATIONS

1. The number of learning outcomes of this programme is quite high. A more concise list of learning outcomes would be more appropriate.
2. More efforts are needed for the lecture schedule to make the timetable more consistent.
3. In order to ensure the renewal of academic staff and expansion of the program more students should be encouraged to continue their studies for a PhD and to choose appropriate thesis projects. Special actions for support of young teaching staff at the University level are encouraging.
4. Make efforts to participate in more international research and educational projects. This will considerably increase mobility and a number of conference papers and article in journals published abroad. It would be encouraging to organize information workshops about Erasmus + and Horizon 2020 programs and distribute appropriate printed and/or electronic information to staff and students. Special actions at the University level are needed to support a participation in the conferences, training abroad etc.
5. Give more emphasis on scientific component of MS final theses to be consistent with Bologna process.
6. The involvement of the teaching staff to the Study Programme Committee activities should be increased. It would be encouraging to include a Professor from the EE Programme in the Study Programme Committee.

### IV. SUMMARY

Current (dated as March 25, 2014) evaluation of the *Electrical Power Engineering* study programme took part after the first international evaluation that was done in November 2010. As a result of the first evaluation the program study was accredited for three years.

The Master programme in Electrical Power Engineering offered by Kaunas University of Technology in the Kaunas campus is a well-designed and successfully running program. The academic content of the program consist of the following 5 modules: Energetic Systems Analyses, Information Systems in Energy, Reliability and Quality of Power Systems, Electromagnetic Transients Processes and Energy Technologies and Environment plus certain electives. The program has a deepening character and aims to strengthen the employability of the

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graduates and provide also the appropriate research foundations to those willing to continue with Doctoral studies.

The program learning outcomes are clearly stated and are based on European directives. The subjects learning outcomes are analytically described and comply with the program learning outcomes. Detailed information regarding the program and subjects learning outcomes appears in the webpage of the EE Program. However, it is suggested to decrease the total number of programme learning outcomes without changing the target aims of the program.

The Curriculum Design (CD) complies very well with the national local legislation, the local regulations for the master programs and in compliance with the Recommendations 3.1 and 3.2 formulated during the last accreditation. From the detailed information about the subjects provided we verify that the content of the subjects and/or modules are consistent with the type and level of the studies. It is added that the employers are very satisfied from the skills acquired by the graduates. This shows that the proposed curriculum design is appropriate. One weakness noted is that in many cases the reference books proposed for some subjects are mainly old ones (for example, in appendix A4.1, page 82). It would be encouraging to enhance MS students' participation in conferences and publications of their results. More efforts are needed to improve the lecture schedule to make the timetable more consistent according to previous Recommendation 3.3 that was implemented partially.

The qualifications of the staff are adequate to ensure successfully the target learning outcomes and their composition satisfies all legal requirements. From the information provided by the staff the contact hours during teaching periods are about 17 hours per week. This load is high and does not provide enough time to staff for research work and publications. The staff exchanges and international mobility of the staff in general is very low and it is due to lack of motivation and lack of time. One teacher is an IEEE member and is engaged at the work of Energy Society. It would be nice to involve more professors, associate professors and in particular Ph.D. and Master students into these activities. During on site visit evaluation team observed that some students participate in the research projects carried at the department and is it in compliance with Recommendation 3.5 formulated during the last visit. Recommendation 3.4 is partially fulfilled, indeed students are more active in mobility but the target places for would be to visit technical universities abroad not necessary fachhochschule in order to keep master programme standards.

During the on-site visit the evaluation team has verified that the learning facilities and laboratory equipment available is in renovation process and are or will be soon suitable for the needs of the programme. Companies provide the equipment and these resources are fully and

efficiently exploited. The library offers electronic access to major scientific databases (e.g. IEEE Xplore). The number of printed books and periodicals although satisfactory could be improved.

The admission requirements to the program are analytically and clearly explained. The whole admission process applied is transparent and it ensures a high quality of entrant Bachelor graduates. The students declared that they have not met any serious problems so far and that they are very satisfied from their studies. More efforts are needed to increase in the future the number of outgoing and incoming students. It was noted a small number of the final thesis subjects is research oriented.

The responsibilities for the implementation of the EE program are clearly described. The responsibilities for specific tasks like the innovation and improvement of the program are given to the faculty Study Program Committee (SPC). It would be encouraging to include a Professor responsible for the EE Program in the SPC. As regards the data collected for monitoring of the program, these are mainly related to the final degree projects, statistics for mobility of students and teachers, student's academic records, etc. These data are analysed by the SPC, used for quality improvement activities and are also available in the university webpage. The overall policy and activities regarding the distribution abroad of information related to the program are insufficient. The marketing activities can be improved by participation for example in international educational fairs. The staff loading is high and it may affect negatively the quality of the programme. The management committees should make an effort to find funding in order to increase the number of staff.



## V. GENERAL ASSESSMENT

The study programme *Electrical power engineering* (state code – 621H63003) at Kaunas University of Technology 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	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
	<b>Total:</b>	<b>18</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. dr. Krzysztof Kozłowski

Grupės nariai:  
Team members:

Prof. dr. Lyudmila Zinchenko

Dr. Olev Martens

Dr. Rolandas Urbonas

Paulius Simanavičius

<...>

#### V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno technologijų universiteto studijų programa *Elektros energetikos inžinerija* (valstybinis kodas – 621H63003) 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
	<b>Iš viso:</b>	<b>18</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

Šis 2014 m. kovo 25 d. studijų programos *Elektros energetikos inžinerija* (toliau – EEI) vertinimas atliktas antrą kartą. Pirmasis tarptautinis vertinimas vyko 2010 m. Po jo studijų programa buvo akredituota trejiems metams.

Magistro programa *Elektros energetikos inžinerija*, kurią siūlo Kauno technologijos universitetas Kauno padalinyje, yra gerai parengta ir sėkmingai veikia. Programos akademinį turinį sudaro šie 5 moduliai: Energetikos sistemų analizė, Informacinės sistemos energetikoje, Elektros sistemų patikimumas ir kokybė, Elektromagnetiniai pereinamieji procesai ir Energetikos technologijos ir aplinka, ir tam tikri pasirenkamieji dalykai. Programa pasižymi gilesniu pobūdžiu ir siekia stiprinti absolventų įsidarbinimo galimybes bei suteikti atitinkamų mokslinių tyrimų pagrindus tiems, kurie nori tęsti studijas doktorantūroje.

Programos studijų rezultatai yra aiškiai išdėstyti ir grindžiami Europos direktyvomis. Dalykų studijų rezultatai aprašyti analitiškai ir atitinka programos studijų rezultatus. Išsami

informacija apie programos ir dalykų studijų rezultatus pateikiama EEI programos tinklalapyje. Tačiau siūloma sumažinti bendrą programos studijų rezultatų skaičių, nekeičiant planinių programos tikslų.

Programos sandara (PS) labai gerai atitinka šalies vietos įstatymus, vietos reglamentus dėl magistrantūros studijų programų ir sudaryta remiantis 3.1 ir 3.2 rekomendacijomis, pateiktomis paskutiniosios akreditacijos metu. Remdamiesi išsamia informacija apie studijuojamus dalykus, patvirtiname, kad dalykų ir (arba) modulių turinys atitinka studijų rūšį ir pakopą. Galima pridurti, kad darbdaviai yra labai patenkinti absolventų įgytais įgūdžiais. Tai rodo, kad siūloma programos sandara yra tinkama. Vienas pastebėtas trūkumas yra tai, kad daugeliu atvejų rekomenduojamos kai kurių dalykų knygos yra daugiausia senos (pavyzdžiui, priedas A4.1, 82 psl.). Skatinama magistrantūros studentus aktyviau dalyvauti konferencijose ir skelbti jų rezultatus. Reikėtų pagerinti paskaitų tvarkaraštį, kad grafikas būtų nuoseklesnis pagal anksčiau pateiktą 3.3 rekomendaciją, kuri buvo įgyvendinta tik iš dalies.

Personalo kvalifikacija yra tinkama sėkmingai tiksliniams studijų rezultatams užtikrinti, jo sudėtis atitinka visus teisės aktuose numatytus reikalavimus. Informacija, kurią pateikė personalas, rodo, kad kontaktinių valandų dėstymo skaičius yra apie 17 valandų per savaitę. Toks krūvis yra didelis ir dėstytojams nelieka pakankamai laiko skirti tiriamiesiems darbams bei publikacijoms. Dėstytojų mainai ir personalo tarptautinis mobilumas yra labai žemas dėl motyvacijos ir laiko trūkumo. Vienas dėstytojas yra IEEE narys ir dalyvauja Energetikos draugijos veikloje. Būtų gerai įtraukti daugiau profesorių, docentų, ypač doktorantų bei magistrantų į šią veiklą. Vizito universitete metu vertinimo grupė pastebėjo, kad kai kurie studentai dalyvauja mokslinių tyrimų projektuose, kurie vykdomi katedroje, o tai atitinka 3.5 rekomendaciją, kuri buvo pateikta paskutiniojo vizito metu. 3.4 rekomendacija įvykdyta iš dalies, nors iš tiesų studentai tapo mobilesni, tačiau būtų galima lankytis technikos mokslų universitetuose užsienyje, nebūtinai aukštosiose mokyklose, siekiant išlaikyti magistro programos standartus.

Vizito universitete metu vertinimo grupė įsitikino, kad patalpos studijoms ir turima laboratorijų įranga yra renovuojama ir kad jos yra arba greitai bus tinkamos programos poreikiams. Įmonės teikia įrangą, ir šie ištekliai yra visiškai ir efektyviai naudojami. Biblioteka siūlo elektroninę prieigą prie pagrindinių mokslinių duomenų bazių (pvz., *IEEE Xplore*). Nors spausdintinių knygų ir periodinių leidinių skaičius patenkinamas, jis galėtų būti dar geresnis.

Priėmimo į programą reikalavimai yra analitiškai ir aiškiai išdėstyti. Visas taikomas priėmimo procesas yra skaidrus ir užtikrina aukštą stojančiųjų bakaluro studentų kokybę. Studentai pripažino, kad iki šiol jie nesusidūrė su jokiais rimtomis problemomis, ir yra labai

patenkinti savo studijomis. Reikia stengtis didinti ateityje išvykstančiųjų ir atvykstančiųjų studentų skaičių. Buvo pažymėta, kad tik nedaug baigiamojo darbo dalykų orientuoti į mokslinius tyrimus.

Atsakomybė už EEI programos įgyvendinimą yra aiškiai aprašyta. Už konkrečias užduotis, pavyzdžiui, naujovių diegimą ir programos tobulinimą, atsako fakulteto Studijų programos komitetas (SPK). Būtų gerai, jei SPK dalyvautų profesorius, atsakingas už EEI programą. Kalbant apie surinktus duomenis, kurių reikia programos stebėsenai, galima teigti, kad jie daugiausia susijęs su galutinės pakopos projektais, statistika apie studentų ir dėstytojų mobilumą, studentų akademinės pažymys ir t. t. Šiuos duomenis analizuoja SPK, jie naudojami kokybei gerinti. Su duomenimis galima susipažinti universiteto tinklalapyje. Bendra politika ir veikla dėl su programa susijusios informacijos platinimo užsienyje yra nepakankama. Rinkodaros veikla gali būti gerinama dalyvaujant, pavyzdžiui, tarptautinėse švietimo mugėse. Dėstytojų darbo krūvis yra didelis, ir tai gali turėti neigiamos įtakos programos kokybei. Vadybos komitetai turėtų pasistengti rasti finansavimą, siekiant padidinti darbuotojų skaičių.

### III. REKOMENDACIJOS

1. Šios programos studijų rezultatų skaičius yra gana didelis. Būtų tikslinga parengti glaustesnį studijų rezultatų sąrašą.
2. Reikia tikslinti paskaitų grafiką, kad jis būtų nuoseklesnis.
3. Siekiant atnaujinti akademinį personalą ir išplėsti programą, reikia skatinti, kad daugiau studentų tęstų savo studijas doktorantūroje ir rinktųsi tinkamus baigiamųjų darbų projektus. Siūloma imtis specialių veiksmų universiteto lygiu jaunam pedagoginiam personalui remti.
4. Stengtis aktyviau dalyvauti tarptautiniuose mokslinių tyrimų ir švietimo projektuose. Tai žymiai padidintų mobilumą ir konferencijose pristatytų pranešimų bei užsienio žurnaluose paskelbtų straipsnių skaičių. Skatinama organizuoti informacijos seminarus apie „Erasmus +“ bei „Horizontas 2020“ programas ir platinti atitinkamą spausdintą ir (arba) elektroninę informaciją dėstytojams bei studentams. Imtis specialių veiksmų universiteto lygiu, siekiant padėti dalyvauti konferencijose, mokymuose užsienyje ir t.t.
5. Daugiau akcentuoti tikslųjų mokslų magistro baigiamųjų darbų mokslinę dalį, kad atitiktų Bolonijos procesą.
6. Didinti pedagoginio personalo dalyvavimą Studijų programos komiteto veikloje. Skatinama į Studijų programos komitetą įtraukti programos *Elektros energetikos inžinerija* profesorių.

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