



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

VILNIAUS TECHNOLOGIJŲ IR DIZAINO KOLEGIJOS

STUDIJŲ PROGRAMOS

ELEKTROS ENERGETIKA

(valstybinis kodas - 653H63001)

VERTINIMO IŠVADOS

EVALUATION REPORT OF

ELECTRIC POWER ENGINEERING

(state code - 653H63001)

STUDY PROGRAMME

at VILNIUS COLLEGE OF TECHNOLOGIES AND DESIGN

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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	Elektros energetika
Valstybinis kodas	653H63001
Studijų sritis	Technologijos mokslai
Studijų kryptis	Elektronikos ir elektros inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3 metai), išštesinė (4 metai)
Studijų programos apimtis kreditais	180 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Elektros energijos profesinis bakalauras
Studijų programos įregistravimo data	2003-05-29, Nr. ĮSAK-762

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	Electric Power Engineering
State code	653H63001
Study area	Technological Sciences
Study field	Electronics and Electrical Engineering
Type of the study programme	Higher Education College Type
Study cycle	First Cycle Studies
Study mode (length in years)	Full-Time (3 years), Part-Time (4 years)
Volume of the study programme in credits	180 ECTS credits
Degree and (or) professional qualifications awarded	Professional Bachelor in Electric Power Engineering
Date of registration of the study programme	29th May, 2003, No ĮSAK-762

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The Centre for Quality Assessment in Higher Education

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I. INTRODUCTION

1.1. Background of the evaluation process

The evaluation of on-going study programmes is based on the **Methodology for evaluation of Higher Education study programmes**, approved by Order No 1-01-162 of 20 December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC).

The evaluation is intended to help higher education institutions to constantly improve their study programmes and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: 1) *self-evaluation and self-evaluation report prepared by Higher Education Institution (hereafter – HEI)*; 2) *visit of the review team at the higher education institution*; 3) *production of the evaluation report by the review team and its publication*; 4) *follow-up activities*.

On the basis of external evaluation report of the study programme SKVC takes a decision to accredit study programme either for 6 years or for 3 years. If the programme evaluation is negative such a programme is not accredited.

The programme is **accredited for 6 years** if all evaluation areas are evaluated as “very good” (4 points) or “good” (3 points).

The programme is **accredited for 3 years** if none of the areas was evaluated as “unsatisfactory” (1 point) and at least one evaluation area was evaluated as “satisfactory” (2 points).

The programme **is not accredited** if at least one of evaluation areas was evaluated as "unsatisfactory" (1 point).

1.2. General

The Application documentation submitted by the HEI follows the outline recommended by the SKVC. Along with the self-evaluation report and annexes, the following additional documents have been provided by the HEI before, during and/or after the site-visit:

No.	Name of the document
1.	An updated curriculum of part-time studies

1.3. Background of the HEI/Faculty/Study field/ Additional information

Vilnius College of Technologies and Design (as described on their web-page <http://www.vtdko.lt/>) was established (in its current structure) in 2008, with the integration of Vilnius Technical College into Vilnius College of Construction and Design. However, the origin of different faculties dates back to as far as 1930s (Technical School). Petras Vileišis Railway

Transport Faculty roots from 1947 the establishment of Vilnius Railway Transport Technical School. Civil Engineering Faculty evolved from Vilnius Technical School of Construction, established in 1954, and so did the Design Faculty.

The College of Technologies and Design consists of 4 faculties: the Civil Engineering Faculty, the Design Faculty, the Petras Vileišis Railway Transport Faculty, and the Technical Faculty. They have around 4,000 students and 400 professors and other staff members. It is a state institution of higher education.

The College of Technologies and Design prepares highly qualified specialists that are able to work successfully throughout Lithuania and the European Union. College applies strategies of lifelong learning. The quality of specialist preparation is constantly being increased in order to meet the growing competitiveness of the labour market.

The qualifications gained by the graduates of the Electric Power Engineering are certified by a Professional Bachelor's degree. The College is awarding the Professional Bachelor diploma in Electric Power Engineering without any specializations.

Previous external evaluation of the study programme was carried out on December 18th, 2012, and it was accredited for three years. Five recommendations were formulated and their implementations are discussed below in the current evaluation report.

1.4. The Review Team

The review team was completed according *Description of experts' recruitment*, approved by order No. 1-01-151 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on 13th October, 2015.

- 1. Prof. dr. habil. Krzysztof Kozlowski (team leader),** *professor at Poznan University of Technology, Poland;*
- 2. Doc. dr. Sergey Shaposhnikov,** *associated professor at St. Petersburg State Electrotechnical University, Russia;*
- 3. Emeritus Prof. dr. Erkki Lakervi,** *professor emeritus at Helsinki University of Technology, Finland;*
- 4. Doc. dr. Gediminas Valiulis,** *associated professor at Šiauliai University, Lithuania;*
- 5. Mr. Ignas Gaižiūnas,** *students' representative from Vilnius University, Lithuania.*

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

Electricity generation, transmission and distribution are the key elements of the electric power engineering. The complexity of these systems and undergoing changes in hardware, software and mentality increasingly requires well-trained engineering personnel.

The demand of the labour market for electric power engineering specialists is high. Thus, the employability of the graduates from the study programme is large. Another indicator of high market demand of electrical power engineers is that there are some students with university education reaching for college-level knowledge and skills in electrical power engineering.

The aim of the study programme “Electric Power Engineering” is to prepare competitive, highly qualified specialists of electrical engineering able to work independently, apply the newest knowledge of technologies and solve professional problems in the area of electrical engineering (SER, par. 8). The aim of the programme is clear and rather ambitious in terms of the application of the newest knowledge of technologies.

The aims and expected learning outcomes of the study programme are formed in accordance with the state strategies, forecasts for electric power engineering prospects. The opinion of social stakeholders concerning the study programme was also considered. Taking into account a rather limited number of programme students, a suggestion can be made that stakeholders could be involved in the study programme in a more intensive way and assist in attracting more students.

The programme aims and learning outcomes are publicly accessible (mostly in the college website and basic information in “AIKOS” information system). Still, some improvements could be done to make learning outcomes more systematic. In addition, more proactive information events about the programme and future employment places could take place at schools.

In the SER (par. 9) it is stated that “The aim of the study programme is based on the requirements for specialists of engineering study field, as established by the TUNING-AHELO framework of expected/desired learning outcomes in engineering, European Standards for the Accreditation of Engineering Programmes (EUR-ACE) and insights on preparation of professional specialists, revealed in communication with Lithuanian companies’ management and specialists”. However, the provided learning outcomes have the structure that is not typical to Tuning-AHELO (5 groups of learning outcomes) and EUR-ACE (6 groups of learning outcomes) framework. Therefore, in the future learning outcomes of the study programme could be formulated using EUR-ACE methodology, which is typical for the engineering study programmes.

There is some inconsistency in SER's Table 2, where some learning outcomes might be contradictory to programme courses (e.g. Physics, Chemistry, Light Technique). Learning outcome "Will be able to select electrical and automation equipment technologies and equipment for practical tasks of electric power production, transfer and distribution" can hardly be understood as ability (skill) to perform research (Table 3 of SER).

Nevertheless, based on the SER and discussion with students, graduates of the programme, social partners and the evaluation team can confirm that the programme aims and learning outcomes were improved since last evaluation. Now programme aims and learning outcomes are more explicit, well accepted by stakeholders, consistent with the type and level of studies and the level of qualification offered.

2.2. Curriculum design

The study programme is designed on the basis of the Law on Higher Education and Research and the Description of General Requirements for Degree-Awarding First Cycle Integral Study Programmes, which govern general principles for programme design and process. The study programme also meets general and special requirements set forth in Regulations for General Technological Sciences (Engineering).

The reviewed programme in general complies with institutional, state and international directives. However, solid standard is not proved in terms of study programme development and management. More attention should be given to the strengthening of the programme. A particular issue will be addressed in the following paragraph.

The curriculum structure for full time studies is based on the requirements for college studies. However, the curriculum design fully meets legal requirements only in full-time studies. In part time (extended) studies, the number of study credits (51) in the last year of studies was too big. [According to Law on Higher Education and Research](#) (Article 47 section 3), "The volume of studies of an extended form for one year must not exceed 45 credits". The problem here is that in the last semester there are 30 study credits and this number is too large for part-time students, so the learning outcomes in the last semester could be quite difficult to achieve. On the other hand, it should be mentioned that during the visit programme managers provided an updated study plan that eliminates this contradiction to legal acts.

Study programme Electric Power Engineering is implemented in full-time and part-time modes. The volume of the study programme is 180 ECTS credits or 4800 academic hours. Studies comprise contact and individual work, consultations and professional practices. The number of contact hours in part-time studies is 781 (16.13 per cent of total number of hours) and

2394 in full-time studies (49.89% of total number of hours). The programme has good proportion of lectures, practical and individual work for both part-time and full-time studies.

Full-time and part-time implementation of the study programme covers 39 subjects (including 5 practices, 3 electives and Graduation Thesis). The maximum number of courses in each semester is equal to seven. The study plan has fair design providing knowledge and skills required for the next steps (subjects) from the previous ones.

As seen from the presented material (subjects' descriptions in the SER) as well as the discussion with students, the subjects' themes are non-repetitive.

The study subject "Electrical Engineering Materials and Measurement" has a strange combination of electric materials and measurement in one course. According to the prerequisites, this course cannot be taught in the first semester in full-time studies, as knowledge in physics and chemistry is required. To study measurement as part of the course, the background in electronics and circuit analysis is also needed.

The course "Electronics" should provide more topics on power electronics. Topics on decentralized energy generation and the integration of renewable energy sources into the existing distribution networks should be also included into the study programme.

The Educational Practice is scheduled in the first semester of part-time studies, which has no course directly related to the study field. Despite the fact that it is quite encouraging to have a study-related course in the very beginning of the studies, this course could be transferred to later semesters, where the necessary background according to the course content will be gained.

Electrical Equipment Assembling Practice also has a questionable placement. According to the prerequisites, the Electric Drives course should be already taken. In part-time studies this type of practice is in the 4th semester, while Electric Drives is in the 5th. It is also advisable to move Electric Devices course to an earlier semester in part-time studies to make this practice more effective.

The content of the programme covers part of modern achievements in technologies, so it could be said that there were improvements made according to the last evaluation recommendations. However, some study subjects could benefit by including more ICT and electronics linked topics (e.g. Electrical Drives, Electrical Engineering Materials and Measurements, Power Stations and Substations). The study literature should be also continuously updated.

Despite some minor drawbacks, study subjects are spread quite evenly, their themes are not repetitive, and the content of the courses is consistent with the type and level of college

studies. To summarize – the improvements regarding the curriculum design were implemented since last accreditation.

2.3. Teaching staff

The programme teachers are appointed to their positions on the basis of their knowledge, skills and competences according to the legal regulations.

Temporary Regulations on Accreditation and Competition for Taking Positions of Researchers and Teachers are based on the Statute of the College, the Law of the Republic of Lithuania on Science and Study No. XI-242 of April 30, 2009, Decree of Lithuanian Research Council No, VII-71 of May 16, 2011 „On Confirmation of the Description of Minimal Qualification Requirements for Researchers’ Positions at State Science and Education Institutions“, Evaluation Methodology for Science (Art) Works Science and Education Institutions, approved by the Ministry of Education and Science Order No. V-572 of April 8, 2011. Since 10th of September, 2015 the new description for engineering study field group was approved by Minister of Education and Science.

According to the SER, in 2014–2015 study year the staff in the programme Electric Power Engineering consisted of 34 teachers, including 6 doctors of science, 2 – doctoral students, 10 – temporary teachers.

The qualification and the number of the teaching staff are quite adequate to ensure learning outcomes. Scientific research of the teachers is mainly focused on electrical machines and drives, electronics and robotics.

Some teachers are active in the field of student practical training organization (B. Mitkienė and L. Krikštaponis) and promotion of students’ creativity (A. Pitrenas). Teachers of the programme participate in Erasmus exchange programme and other international initiatives (J. Petrusis, A. Pitrenas).

Over the period evaluated about half of teachers have changed, which is quite a big number. The main reason for teachers’ shift is retirement or change of living or working place.

The administration of Vilnius College of Technologies and Design provides possibilities for teaching staff to attend trainee programmes, refresher courses, and exhibitions. So the overall situation concerning their professional development is reasonable.

As in 2014 (SER, p.16), the total number of teachers of the programme was 34. The 32% of them are aged over 60, which is quite a big proportion. Typically, all teachers have sufficient experience, both pedagogically and in the speciality. However, strategy on lecturing personnel and involvement of more full-time young teachers and teachers from industry to the programme should be developed and deployed.

The number of teacher job positions of this programme seems quite low, e.g. in year 2013–2014 there was only 1.1 teacher job position for this programme.

Nevertheless, the scientific activity of teachers is topical and important for the programme and it is relevant to the subjects taught. Some programme teachers publish scientific papers or articles in mass media (B. Karaliūnas, R. Matuliauskas, A. Pitrenas, R. Strazdienė, L. Krikštonis). However, the applied scientific activity could be encouraged by the administration of the college. As a recommendation, more activities for the staff could be suggested – to be more involved in international co-operation, exchanges with other academic and professional institutions, as well as with the industry.

2.4. Facilities and learning resources

The facilities comply with the requirements and needs for the study process. The college has implemented a project subsidised by EU structural funds – the reconstruction of the Technical Faculty building and renovation of laboratory equipment have been performed.

The implementation of the study programme takes place in 21 auditoriums (5 of which are for stream lectures) and in 12 laboratories. The premises for studies are adequate both in their size and quality.

The general subjects of college studies are conducted in general streams together with the students of other Faculty programmes. The practical training classes of the core and compulsory subject modules are carried out in specialized laboratories of Applied Physics, Mechanics, Mechatronics, Electronics, Microcontrollers, Engineering Materials, Electrotechnics, Electrical Engineering Network, Automation, Electrical Machinery, Electrical Equipment, Building Control Systems. There are also computer rooms with hardware and software provided.

To perform individual tasks students can use the library and reading-room. The reading-room is equipped with a sufficient number of places for individual work, 13 of them are computer-aided. The library fund is formed considering the needs of the study programme. Most of the computers are connected to the university's computer network and the Internet. Wi-Fi internet service is available in Faculty areas, so students can use it with their personal computers and smart phones.

Currently, students can use 84 personal computers in information technologies auditoriums, laboratories and libraries. Lego Mindstorm, Unitrain-I and other modern laboratory equipment for student training is used in the study process. The new electrical power system simulator TERCO PST2000 can be identified as a core experimental platform for electrical network analysis. However, there is a lack of modern equipment that is used for measurements in electrical networks (e.g. power quality analysers; insulation, installation, earth-loop resistance

testers; infrared camera). It should be noted that facilities and learning resources were improved since last evaluation it means that recommendation 3.5 (from the previous evaluation report) was implemented. The further improvement of labs would be highly appreciated by students, the staff and the stakeholders.

The number of students does not exceed the number of work places. Laboratory and practical tasks are organized in subgroups.

The college provides possibilities for practical training locally and at industrial sites. The study programme awards 30 credits for professional practices. Educational practices are performed in the laboratories of the College (Educational Practice and Technology Practice) covering the topics of wiring of electrical equipment, electrical machinery, electrical network, automation and mechatronics. The premises for practices are good both in their size and quality.

Professional practices (Industrial and Final) are performed in enterprises („Elektros darbai“, JSC „Arganda“, JSC „Elstila“, JSC „Energus“, JSC „OBO Bettermann“, JSC „Vilniaus gatvių apšvietimo tinklai” etc.). The choice of practice placement is also facilitated by EU project *The Development of the System for Organizing Students Practice in Enterprises of Lithuanian Electric Engineering Sector* with the participation of the majority of electrical engineering enterprises.

Teaching materials (textbooks, books, periodical publications, databases) are adequate and accessible. However, the library of the College does not have many modern books that are directly related to Electric Power Engineering. The library subscribes for science popularisation, publications, e-books, and some databases. Methodical resources are being updated systematically or upon the request. E-learning environment *Moodle* is used in the teaching process, allowing the distribution of teaching materials to students.

It can be outlined that all of the facilities for general use are indeed excellently designed to create a very good atmosphere. However, the specialized material resources specifically for this programme could still be developed and improved.

2.5. Study process and students' performance assessment

Admission to the study programme Electric Power Engineering is performed on a competitive basis following general admission regulations of LAMA BPO (Association of Lithuanian Higher Education Institutions) and admission regulations approved by College.

The admission requirements are similar to other engineering programmes in Lithuania. The admission of the students is conducted according to legal regulations. The admission to the study programme Electric Power Engineering is carried out in two ways: during the joint

admission to the Lithuanian higher educational institutions and the second admission to the vacant fee-paying study places.

The average as well as highest assessment grade of admitted students is quite small (SER page 24-25, table 12). Students are admitted to both part-time and full-time study mode of the programme. After full-time studies were implemented students tend to choose this study mode. There were inconsistencies in terms of part-time studies and the number of credits prior the on-site visit, it was resolved once the evaluation team arrived. Nevertheless, this issue will be further addressed in the programme management area.

According to the admission results (LAMA BPO data), in year 2015 the number of entrants declined dramatically, only 7 students received state funding (6 in full-time and 1 in part-time studies). Compared to another study programme “Electrical and Automation Engineering”, this number is about seven times smaller. The minimum score to get entrance to the College is equal to 0.8 (since year 2015). According to LAMA BPO, the minimum scores to receive the state funding for this programme in 2015 were 2.4 (full-time studies) and 5.34 (part-time studies). Students providing their own funding were invited to study with the following scores: 1.68 (full-time studies) and 1.14 (part-time studies). According to LAMA BPO data, in 2015 six students in full-time studies and five in part-time studies signed study agreements.

Much work should be done to admit more students in the programme.

The ratio of the programme entrants and graduates is about 1.25. It should be noted that this ratio is relative – some students who have withdrawn from their studies return to resume them later, students move to/from other programmes or modes, etc. The majority of students suspend their studies during the first year or last year (part-time students only). The main reason to suspend studies is the lack of motivation and insufficient preparedness after secondary school. In further years, students are not always able to successfully combine studies with work and therefore quit their studies. A part of students quit studies due to economic reasons – because of the lack of funds to pay for their studies.

Some programme students participate in the ERASMUS exchange program, e.g. in the year 2014–2015 two students studied in the Bialystok University of Technology (Poland), one in Anadolu University (Turkey). Part-time students do not participate in ERASMUS exchange programme due to job related reasons. However, some students had short visits within other exchange programmes.

Students in difficult financial circumstances can receive social grants. College also provides study grants based on study achievements.

Students are encouraged to participate in different activities concerning research, different types of contests, sports, culture, etc. Still, more activities could be recommended. The College organises career consultations that are favoured by students.

The assessment system of students' performance is clear, adequate and publicly available. The examinations are distributed evenly during the whole session time. Students are provided opportunity to repeatedly account for study subjects after the end of the exam session. Students who fail to pass an examination can retake it after three working days. Having liquidated debts during the established periods of time, the studies are continued.

Following the results of college graduates' surveys, the character of the professional activity of the graduates corresponds to the aim of the study programme. Graduates are satisfied with the choice of speciality and express opinion that they acquired the knowledge and skills marketable in the labour market. Employability of the graduates from the college study programme is more than 90%. Also it can be said that professional activity of the majority of graduates meets the Programme providers' expectations.

2.6. Programme management

Vilnius College of Technologies and Design has the internal quality system providing main quality management principles and procedures. Currently, the process of study quality management in College is coordinated at several levels:

- College level;
- Faculty level (responsibility of the Faculty Council, the Academic Council, Dean of the Faculty, administration);
- Department level (responsibility of the Head of the Department, the program coordinator, Study Programme Committee (hereafter – SPC));
- The teacher's level (responsibility of each teacher).

The Faculty Council and the Academic Council are responsible for strategy formation and its supervision.

The Dean of the Faculty assures the quality of studies and applied scientific research and takes care of the implementation of the strategic plan. Issues important and topical for the studies (scholarships, academic exchange, study infrastructure) are discussed at the meetings of the Faculty Executive Board.

Department of Electrical Engineering plays the key role in programme management though direct communication between lecturers, students and stakeholders. There is a Study Programme Committee that is responsible for the continuous monitoring of the aims and learning

outcomes of the study programme, as well as improvement of its quality on a general basis. The committee consists of 5 people: social stakeholders, representatives of the college and students.

Detailed information about studies is constantly provided to students by the administration, heads of departments, group tutors and teachers. All information is presented and regularly updated on the Internet website of the College.

Students' opinion about study programme's individual subjects and the quality of teaching is revealed by questionnaires. Analysis of the questionnaires helps to identify weaker aspects of the programme, which are then taken into account to improve the quality of the studies (e.g. regarding the students' opinion, some optional subjects were introduced). The students however were not aware of the activities done by the SPC. Still, generally speaking, it can be concluded that students are satisfied with their studies.

The majority of teachers declare that they submit proposals and initiate changes in the study programme thus influencing the successful implementation of the study programme.

Employers make the particular positive influence on the study process participating in programme committees, providing their insights and recommendations on study process improvement. Some of them are directly participating in the study process by teaching and practical training. During the visit it was found out that graduates of the programme would like to contribute their experience to the development of the programme in more intensive way. Programme managers could find ways to establish a closer contact with alumni and employers for the benefit of the programme. (e.g., round table discussions, guest lectures, visits to industrial sites). Programme stakeholders indicated that in general they are satisfied with the programme. Formally and informally they discuss with lecturing personnel about the programme and its outcomes. It is unclear whether these discussions give any impact to the improvement to the programme.

Despite the fact that responsibilities for decisions and monitoring of the implementation of the programme are rather clearly allocated, in the team of experts' opinion, the study programme management works more on a formal level and the SP management at the department level is only satisfactory and must be significantly improved. This opinion is based on these indicators:

- The curriculum design did not meet all legal requirements for part time students before the evaluation group arrived (e.g. 51 credit per year in part time studies). So there may have been a reasonable amount of time that the part-time studies did not meet legal requirements for the curriculum design. The study programme managers overlooked this issue.
- The previous expert recommendations have not been fully implemented yet (the study programme does not include significantly more practical experience in the fields of

high voltage and high current equipment, its installation, operation and maintenance; there is the lack of student and teacher international exchange and there are no partner-programmes in this study area; there is a big deficit of practical industrial research and consulting).

- Students are not fully aware of important information such as Study Programme Committee. The connection between graduates, social partners and the College could be improved as well (as the stakeholders expressed their wish to be involved more actively).

- It seems that there is no strategy for promoting applied research activities.

There is a certain feeling that the College put much more attention to the Automation study programme compared to Electric Power Engineering. Nevertheless, this study programme is demanded by industry and it should be continued. Marketing strategy on promotion of the study programme should be developed (including more attractive communication in schools, festivals, and Open Carrier days). Higher involvement of students and key employers in the programme promotion could be a good stimulus for newcomers. In conclusion – as it was stated, though the programme management seems to work on the formal level, in reality there are quite many things that need to be improved starting with distribution and supervision of responsibilities, as well as internal and external communication within the College.

III. RECOMMENDATIONS

1. More attention should be paid and efforts put in order to attract graduates from secondary schools to the programme, including more attractive communication in schools, festivals, and Open Career days. More proactive co-operation with secondary schools as well as with social partners could be considered.
2. The study programme management at the department level must be significantly improved. More attention should be paid to the regular update of the programme content and higher involvement of programme stakeholders into the study programme development.
3. Strategy on lecturing personnel and involvement of more full-time young teachers and teachers from industry to the programme should be developed and deployed.
4. Applied research activities should be promoted systematically.
5. Learning outcomes of the study programme could be formulated using EUR-ACE methodology that is typical for the engineering study programmes.

IV. SUMMARY

Electricity generation, transmission and distribution are the key elements of the Electric Power Engineering programme. The complexity of these systems and undergoing changes in hardware, software and mentality increasingly requires well-trained engineering personnel.

The aim of the study programme meets the needs of the labour market. The programme in general complies with institutional, state and international directives. The demand of the labour market for electric power engineering specialists is high. The programme's aims and learning outcomes of the study programme "Electric Power Engineering" are consistent with the type and level of studies and the level of qualification offered. Still, some improvements could be done to make learning outcomes more systematic. In addition, more pro-active information events about the programme and the future employment places should take place at schools.

The content of the programme covers part of modern achievements in technologies. However, some study subjects could include more ICT and electronics linked topics (e.g. Electrical Drives, Electrical Engineering Materials and Measurements, Power Stations and Substations). The study literature should be also continuously updated.

Despite some minor drawbacks, study subjects are spread quite evenly, their themes are not repetitive, and the content of the courses is consistent with the type and level of college studies.

The qualification and the number of the teaching staff are quite adequate to ensure learning outcomes. Scientific research of the teachers is mainly focused on electrical machines and drives, electronics and robotics.

The administration of Vilnius College of Technologies and Design provides possibilities for teaching staff to attend trainee programmes, refresher courses, and exhibitions. So the overall situation concerning their professional development is reasonable.

However, the applied scientific activity is moderate and should be encouraged by the administration of the college. As a recommendation, more activities for the staff could be suggested – to be more involved in international co-operation, exchanges with other academic and professional institutions, as well as with the industry.

The facilities comply with the requirements and needs for the study process. The college has implemented a project subsidised by EU structural funds – the reconstruction of the Technical Faculty building and renovation of laboratory equipment have been performed. The new electrical power system simulator TERCO PST2000 can be identified as a core experimental platform for electrical network analysis. The lab facilities are modernized constantly. Teaching materials (textbooks, books, periodical publications, databases) are

adequate and accessible. All of the facilities for general use are designed to create a very good atmosphere. However, further development of labs could be highly appreciated by students, the staff and the stakeholders.

Admission to the study programme Electric Energy is performed on a competitive basis following general admission regulations of LAMA BPO (Association of Lithuanian Higher Education Institutions) and admission regulations approved by College. According to the admission results, in year 2015 the number of entrants declined dramatically, thus much work should be done to collect more students in the programme.

The ratio of programme entrants and graduates is about 1.25. It should be noted that this ratio is relative – some students who have withdrawn from their studies return to resume them later, students move to/from other programmes or types, etc.

College provides social grants and study grants based on study achievements. Students are encouraged to participate in different activities concerning research, different types of contests, sports, culture, etc. Students are provided with the information on mobility programme, but students' international exchange activity is low.

The assessment system of students' performance is clear, adequate and publicly available. The examinations are distributed evenly during the whole session time. Graduates are satisfied with the study process and express opinion that they acquired the knowledge and skills marketable in the labour market.

Vilnius College of Technologies and Design has an internal quality system providing main quality management principles and procedures.

Despite the fact that responsibilities for decisions and monitoring of the implementation of the programme are clearly allocated, in experts' opinion, the study programme management at the department level for this specific programme is only satisfactory and must be significantly improved. This conclusion is based on certain facts concerning curriculum design and supervision of study programme. An issue regarding part-time studies and ECTS distribution was overlooked by the programme managers for a certain amount of time.

Programme stakeholders indicated that in general they are satisfied with the programme. Formally and informally they discuss with lecturing personnel about the programme and its outcomes. It is unclear whether these discussions give any impact to the improvement to the programme.

This study programme is demanded by industry and should be continued. Marketing strategy on promotion of the study programme should be developed. Higher involvement of students and key employers in the programme promotion could be a good stimulus for newcomers.

V. GENERAL ASSESSMENT

The study programme Electric Power Engineering (state code – 653H63001) at Vilnius College of Technologies and Design is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	2
	Total:	17

*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 Kozlowski
Grupės nariai: Team members:	Doc. dr. Sergey Shaposhnikov
	Emeritus Prof. dr. Erkki Lakervi
	Doc. dr. Gediminas Valiulis
	Mr. Ignas Gaižiūnas

**VILNIAUS TECHNOLOGIJŲ IR DIZAINO KOLEGIJOS PIRMOSIOS PAKOPOS
STUDIJŲ PROGRAMOS *ELEKTROS ENERGETIKOS* (VALSTYBINIS KODAS –
653H63001) 2015-12-02 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-319 IŠRAŠAS**

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus technologijų ir dizaino kolegijos studijų programa *Elektros energetika* (valstybinis kodas – 653H63001) 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	2
	Iš viso:	17

* 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

Elektros gamyba, perdavimas ir paskirstymas yra pagrindiniai *Elektros energetikos* studijų programos elementai. Dėl šių sistemų sudėtingumo ir nuolatinių pokyčių, susijusių su aparatine bei programine įranga ir intelektu, nuolat didėja kvalifikuotų inžinierių poreikis.

Studijų programos tikslas atitinka darbo rinkos poreikius. Iš esmės programa atitinka institucijos, valstybės ir tarptautines direktyvas. Elektros energetikos specialistų poreikis darbo rinkoje yra didelis. *Elektros energetikos* studijų programos tikslai ir numatomi studijų rezultatai atitinka studijų rūšį, pakopą ir kvalifikacijų lygį. Vis dėlto būtų galima atlikti kai kuriuos patobulinimus siekiant labiau susisteminti numatomus studijų rezultatus. Be to, mokyklose turėtų būti organizuojama daugiau informacinių renginių apie programą ir būsimas darbo vietas.

Į programos turinį įtraukta tam tikra naujų technologijų srities pasiekimų dalis. Tačiau kai kurie studijų dalykai turėtų apimti daugiau su IRT ir elektronika susijusių temų (pvz., elektros pavaros, elektros inžinerijos medžiagos ir matavimai, elektrinės ir pastotės). Be to, reikėtų nuolat atnaujinti studijų literatūrą.

Nepaisant kai kurių nedidelių trūkumų, studijų dalykai išdėstyti nuosekliai, jų temos nesikartoja, o dalykų turinys atitinka koleginių studijų rūšį ir pakopą.

Dėstytojų kvalifikacija ir skaičius yra pakankami numatomiems studijų rezultatams užtikrinti. Dėstytojų atliekami moksliniai tyrimai daugiausia susiję su elektros mašinomis ir pavaromis, elektronika ir robotika.

Vilniaus technologijų ir dizaino kolegijos administracija suteikia dėstytojams galimybę dalyvauti stažavimosi programose, tobulinimosi kursuose ir parodose. Taigi bendra padėtis, susijusi su profesiniu tobulėjimu, yra priimtina.

Tačiau mokslo taikomoji veikla yra nuosaiki, tad Kolegijos administracija turėtų ją paskatinti. Darbuotojams siūloma dalyvauti įvairesnėje – tarptautinio bendradarbiavimo, mainų su kitomis mokslo bei profesinėmis institucijomis – veikloje.

Patalpos ir įranga atitinka reikalavimus ir studijų proceso poreikius. Kolegija įgyvendino iš ES struktūrinių fondų subsidijuojamą projektą – atlikta Technikos fakulteto pastato rekonstrukcija ir atnaujinta laboratorinė įranga. Naujas elektros energijos sistemos imituoklis TERCO PST2000 gali būti laikomas pagrindine eksperimentine elektros tinklų analizės platforma. Nuolat modernizuojama laboratorinė įranga. Metodinė medžiaga (vadovėliai, knygos, periodiniai leidiniai, duomenų bazės) yra tinkama ir prieinama. Visos bendrosios paskirties patalpos ir įranga sukuria labai gerą aplinką. Tačiau studentams, darbuotojams ir socialiniams dalininkams labai patiktų, jei laboratorijos būtų ir toliau tobulinamos.

Studentų priėmimas į *Elektros energetikos* studijų programą vykdomas konkurso pagrindu, laikantis LAMA BPO (Lietuvos aukštųjų mokyklų asociacijos) bendrųjų priėmimo reikalavimų ir Kolegijos patvirtintų priėmimo taisyklių. Remiantis priėmimo rezultatais, 2015 m. ryškiai sumažėjo stojančiųjų skaičius, taigi reikėtų daug nuveikti siekiant pritraukti daugiau studentų į šią programą.

Įstojusiųjų į šią programą ir jos absolventų santykis yra maždaug 1,25. Reikėtų pažymėti, kad šis santykis yra reliatyvus – kai kurie studentai, pasitraukę iš studijų, vėliau grįžta, kad jas baigtų, studentai pereina iš vienos programų į kitas arba iš vienos rūšies programos į kitą ir t. t.

Kolegija suteikia socialines pašalpas ir stipendijas, pagrįstas studijų rezultatais. Studentai skatinami dalyvauti įvairioje veikloje, susijusioje su moksliniais tyrimais, įvairių rūšių

konkursais, sportu, kultūra ir t. t. Studentai gauna informaciją apie judumo programą, bet jų dalyvavimo tarptautinėje mainų programoje lygis žemas.

Studentų pasiekimų vertinimo sistema yra aiški, tinkama ir viešai skelbiama. Egzaminai yra tolygiai paskirstyti per visą sesiją. Absolventus tenkina studijų procesas; jie sako, kad įgijo žinių ir įgūdžių, turinčių paklausą darbo rinkoje.

Vilniaus technologijų ir dizaino kolegija yra įdiegusi vidinio kokybės užtikrinimo sistemą, numatančią kokybės valdymo principus ir procedūras.

Nepaisant to, kad atsakomybė už sprendimus ir programos įgyvendinimo stebėseną yra aiškiai paskirstyta, ekspertai mano, kad vadovavimas šiai studijų programai katedros lygmeniu yra tik patenkinamas ir jį būtina nemažai tobulinti. Ši išvada grindžiama kai kuriais faktais, susijusiais su programos sandara ir studijų programos turiniu. Tam tikrą laiką programos vadovai neatkreipė dėmesio į problemą, susijusią su išstėtinėmis studijomis ir ECTS kreditų paskirstymu.

Programos socialiniai dalininkai nurodė, kad apskritai programa juos tenkina. Jie kartu su dėstytojais oficialiai ir neoficialiai aptarė šią programą ir jos rezultatus. Neaišku, ar šios diskusijos padeda tobulinti programą.

Ši studijų programa turi paklausą pramonės sektoriuje, tad turi būti tęsiama. Reikėtų parengti rinkodaros strategiją, skirtą šios studijų programos reklamavimui. Gausėnis studentų ir pagrindinių darbdavių dalyvavimas programos reklamavimo procese labai paskatintų naujų studentų atsiradimą.

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III. REKOMENDACIJOS

1. Reikėtų daugiau dėmesio ir pastangų skirti vidurinių mokyklų absolventų pritraukimui į šią programą, įskaitant patrauklesnes informavimo formas vidurinėse mokyklose, šventiniuose ir karjeros dienų renginiuose. Būtų galima apsvarstyti galimybę iniciatyviau bendradarbiauti su vidurinėmis mokyklomis ir socialiniais partneriais.
2. Būtina smarkiai pagerinti vadovavimą *Elektros energetikos* studijų programai katedros lygiu. Daugiau dėmesio turėtų būti skiriama nuolatiniam programos turinio atnaujinimui ir socialinių dalininkų įtraukimui į studijų programos tobulinimo procesą.
3. Reikėtų parengti ir įgyvendinti dėstytojų, didesnio skaičiaus jaunų dėstytojų, kurie dirbtų visu etatu, ir dėstytojų iš pramonės sektoriaus įtraukimo į šią programą strategiją.
4. Turėtų būti sistemingai skatinama mokslo taikomoji veikla.
5. Studijų programos numatomi studijų rezultatai galėtų būti formuluojami remiantis EUR-ACE metodika, kuri yra būdinga inžinerijos studijų programoms.

Paslaugos teikėjas patvirtina, jog yra susipažinęs su Lietuvos Respublikos baudžiamojo kodekso 235 straipsnio, numatančio atsakomybę už melagingą ar žinomai neteisingai atliktą vertimą, reikalavimais.

Vertėjos rekvizitai (vardas, pavardė, parašas)