CENTER FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD

ELECTRICAL ENGINEERING

at Klaipėda University

Expert panel:

1. **Prof. Dr. Laszlo Tamas Koczy (panel chairperson)** *academic,*
2. **Prof. Dr. Toomas Rang Marko Čepin,** *academic,*
3. **Prof. Dr. Žilvinas Nakutis,** *academic,*
4. **Dr. Matthew Armstrong,** *academic,*
1. **Dr. Andrius Šablinskas,** *representative of social partners'*
2. **Mr. Ruben Janssens,** *students' representative.*

Evaluation coordinator – *Ms. Natalija Bogdanova*

Report language – English

Vilnius
2021

Study Field Data*

Title of the study programme	*Electrical Engineering*
State code	6121EX062
Type of studies	University studies
Cycle of studies	First
Mode of study and duration (in years)	Full-time 3,5, Part-time 5
Credit volume	210
Qualification degree and (or) professional qualification	Bachelor of Engineering Sciences
Language of instruction	Lithuanian, English
Minimum education required	Secondary
Registration date of the study programme	1997-05-19

** if there are **joint** / **two-fields** / **interdisciplinary** study programmes in the study field, please designate it in the foot-note*

CONTENTS

I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 Order No. V-149.

The evaluation is intended to help higher education institutions to constantly improve their study process 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) site visit of the expert panel to the higher education institution; 3) production of the external evaluation report by the expert panel and its publication; 4) follow-up activities.*

On the basis of the external evaluation report of the study field SKVC takes a decision to accredit study field either for 7 years or for 3 years. If the field evaluation is negative such study field is not accredited.

The study field and cycle are **accredited for 7 years** if all evaluation areas are evaluated as "exceptional" (5 points), "very good" (4 points) or "good" (3 points).

The study field and cycle are **accredited for 3 years** if one of the evaluation areas was evaluated as "satisfactory" (2 points).

The study field and cycle are **not accredited** if at least one of evaluation areas was evaluated as "unsatisfactory" (1 point)

1.2. EXPERT PANEL

The expert panel was completed according to the Experts Selection Procedure (hereinafter referred to as the Procedure) approved by the Director of Centre for Quality Assessment in Higher Education 31 December 2019 Order No. V-149. The site-visit to the HEI was conducted on-line by the panel on 7th *December 2020.*

Prof. Dr. Laszlo Tamas Koczy (panel chairperson), *professor of Széchenyi István University, Department of Information Technology, professor of Budapest University of Technology and Economics, Department of Telecommunications and Media Informatics, Hungary;*

Prof. Dr. Toomas Rang, *Professor Emeritus of Thomas Johann Seebeck Department of Electronics; Tallinn University of Technology, Estonia;*

Prof. Dr. Žilvinas Nakutis, *professor of Kaunas University of Technology, Department of Electronic Engineering, Lithuania;*

Dr. Matthew Armstrong, *senior lecturer of Newcastle University, School of Electrical & Electronic Eng., U. K.;*

Dr. Andrius Šablinskas, *Sales Director at Schneider Electric Lietuva, Lithuania;*

Mr. Ruben Janssens, *student of Ghent University, study programme in Computer Science Engineering, Belgium.*

1.3. GENERAL INFORMATION

The 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 the site-visit:

No.	Name of the document
1	32 files containing descriptions of study modules in the shared Google Drive Folder Savianalizei__2020-10-10/Study_Subject_Descriptions_Electrical_Engineering_KU
2	Additional video material on laboratories 413, 415, 416, 417

1.4. BACKGROUND OF STUDY FIELD/STUDY FIELD PLACE AND SIGNIFICANCE IN HEI

The Klaipėda University (KU) was established in 1991. Around 2700 students currently study at KU. University-level studies in the field of electrical engineering date back to 1961, when evening studies were provided at the Klaipėda branch of Kaunas Polytechnics Institute. Currently the Electrical Engineering Bachelor degree program is executed at the Faculty of Marine Technology and Natural Sciences, Department of Engineering. In 2015, the merging of the Electromechanical, Mechanical Engineering, and Technological Processes Departments resulted in a single Department of Engineering. The Electrical Engineering 1st cycle study (undergraduate) program (state code 6121EX062) is implemented at the Department in full-time (3.5 years) and part-time (5 years) modes. The language of instruction of the program is Lithuanian for the part-time mode, and Lithuanian and English for the full-time mode. The Department also implements graduate study programme Innovative Electrical and Automation Systems.

The last external evaluation of the Electrical Engineering study program was performed by the Study Quality Assessment Centre in 2014 and it was accredited for 6 years until 30 June 2021 (Resolution No. SV6-43). In 2018 and 2019, no students were admitted to the program. In 2018, Electrical Engineering program was converted to the specialization in the Informatics Engineering program for the implementation by the KU Engineering Department. Due to insufficient number of students admitted in 2018 to the Informatics Engineering program, the specialization Electrical Engineering could not have been executed. Therefore, in 2019, the Electrical Engineering program was renamed to Electrical Engineering and Robotics and separate admission to the program (not specialization) renewed.

II. GENERAL ASSESSMENT

First cycle Electrical Engineering study field at Klaipėda University is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Study aims, outcomes and content	3
2.	Links between science (art) and study activities	3
3.	Student admission and support	3
4.	Studying, student performance and graduate employment	3
5.	Teaching staff	2
6.	Learning facilities and resources	4
7.	Study quality management and publicity	3
	Total:	**21**

*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 evaluated very well in the national and international context, without any deficiencies;
5 (exceptional) - the field is exceptionally good in the national and international context/environment.

III. STUDY FIELD ANALYSIS

3.1. STUDY AIMS, OUTCOMES AND CONTENT

Study aims, outcomes and content shall be assessed in accordance with the following indicators:

3.1.1. *Evaluation of the conformity of the aims and outcomes of the field and cycle study programmes to the needs of the society and/or the labour market (not applicable to HEIs operating in exile conditions)*

(1) Factual situation

The Electrical Engineering (EE) Study Programme (SP) at Klaipėda University (KU) aims at addressing the needs and development strategy of the labour market of Western Lithuania region that are described in strategic documents "Lithuania's Progress Strategy Lithuania 2030: Klaipėda 2030", "Western Lithuania 2025". Implementation of the SP is linked to the needs and benefits for society in terms of employment, environmental, health, prosperity, and modernity aspects. The aim of the program is to prepare qualified engineers skilled in electrical engineering and robotics and able to work in machinery, equipment, industry, energy, transport and other enterprises in positions like leading specialists, technicians, automation and robotics specialists, designers, as well as in scientific laboratories. Graduates' ability to think critically, to be creative and to engage himself in lifelong learning is emphasized among the aims of the SP. The results of SP are arranged according to the recommendations of European Network for Accreditation of Engineering Education (EUR-ACE) and include analysis and synthesis of electrical systems, industrial communication networks and robotics applications, designing, modelling, and experimental verification methodologies of automated control, energy, and measurement systems. These aims and outcomes are coherent with the field of activity of energy, automotive, food, shipbuilding and repair, wood processing, lighting and other manufacturing and design oriented industries operating in the region.

(2) Expert judgement/indicator analysis

The justification of the SP conformance to the needs of society and labour market are addressed considering a generally high demand for engineering graduates. However, the demand of in particular EE graduates is not quantified. Most of the companies regarded as employers of SP graduates are focusing on manufacturing. The highest value added production is achievable in sectors aiming at designing of innovative products or services. These should be looking for university graduates skilled in designing activities. However, any engineering design knowledge and skills demands by the industry are not clearly identified. Nevertheless, it was convincingly articulated during on site interviews that the industrial sector really lacks engineering graduates in Klaipėda region. The small number of interested students in the SP is probably related to processes in secondary schools and society. Social

partners suppose that pupils are afraid of too complex technological sciences and tend to study computer oriented fields. To advertise engineering and EE in particular, teachers of KU cooperate with Klaipėda gymnasium by giving lessons, organizing excursions at KU premises, etc. Despite these obviously good measures the visibility of electrical engineering at KU still has to be sharpened by advocating at university level and further promoting the field together with stakeholders.

3.1.2. *Evaluation of the conformity of the field and cycle study programme aims and outcomes with the mission, objectives of activities and strategy of the HEI*

(1) Factual situation

Being a multidisciplinary educational institution KU specifically heads towards the field of marine sciences and studies in its strategy. As an important regional Western Lithuania university, the KU aims at education and research related to coastal region industry and society needs.

(2) Expert judgement/indicator analysis

The described and publicly advertised results of EE SP are not explicitly bound to any maritime/coastal specific technologies despite that some courses of the SP are linked to maritime region technologies. The coherence between the strategy of HEI and the study programme results in the field of maritime technologies could be revised. By addressing the specificity of EE in maritime/coastal technologies and applications the SP could become unique in the country and thus highlight its identity stronger.

3.1.3. *Evaluation of the compliance of the field and cycle study programme with legal requirements*

(1) Factual situation

According to the classification of study fields by the Minister Decree 2016 Dec. 1st No. V-1075 the programme is attributed to the Electrical Engineering (E08) field. The structure of the programme complies with the requirements formulated in the Minister's Order on approval of description of general requirements for the provision of studies (No. V-1168 of 30 December 2016). In particular, the total ECTS volume of full-time mode is 210 and ECTS volume of one year in credits is 60 as recommended by the Law on Science and Studies of the Republic of Lithuania (Consolidated Version 19/06/2018). Practice and finals thesis are attributed 15 ECTS each, which corresponds to the General study requirements according to the Order of Minister of Education and Science of the Republic of Lithuania Order No. V-1168. The number of study semesters (7), the volume of self-study of each study subject (more than 50 %) and the volume of general education subjects (15) are compliant with Resolution on the study regulations of KU approved by KU Senate. It is requested in the Order V-1168 that "50% of the first-cycle university level <…> subjects of study fields must be taught by

scientists/researchers". Though in the SER, a precise expression of percentage of subjects taught by scientists/researchers is not given and might be quite complicated to assess due to several teachers contributing to different subjects, it is evident that most of the staff declares their fields of scientific interest that are in line with the content of the Programme.

(2) Expert judgement/indicator analysis

The expert panel confirms that the programme complies with national and KU's legislation requirements in terms of study duration, programme structure, and study volume expressed by ECTS credits applicable for the first study cycle. Requirements for the study field that are described in the Descriptor of the study field of engineering (Order No V-964 of the Minister of Education and Science of the Republic of Lithuania of 10 September 2015) are well addressed by the expected outcomes of the SP and supported by the programme study plan which includes general university study subjects (12 ECTS), field of study subjects (143 ECTS), practice (15 ECTS) and final thesis (15 ECTS), accompanied with elective courses (25 ECTS). Outcomes of the SP are aligned with the expected knowledge, abilities, and skills outlined in the Annex 6. DESCRIPTOR OF THE STUDY FIELD OF ELECTRONIC AND ELECTRICAL ENGINEERING for the first cycle university studies.

3.1.4. *Evaluation of compatibility of aims, learning outcomes, teaching/learning and assessment methods of the field and cycle study programmes*

(1) Factual situation

Teaching and study methods in the programme include lectures (contact and distance), exercises, laboratory works, problem solving, case studies, individual consultations, seminars, practice and final thesis. The learning process includes individual and team work. Literature analysis, individual works, course projects, final thesis are examples of individual studying in the SP. Team work skills are developed by delivering group tasks. Starting from the 5th semester in the full-time study mode, the semester course work is coupled with some modules (Electronics and Course work, Electrical Machines and Course Project, Automatic Control Theory and Course Project). Professional software for electrical systems modelling, signal processing, statistical analysis, electrical schematics drawing, microcontroller programming, etc. is used in the study process. Laboratories equipped with teaching stands serve for practical skills development by means of prototyping, programming, and measuring activities. Due to the emerging restrictions caused by pandemics the department plans to extend the use of remote software for teaching. Cumulative scoring is adapted in study subjects grading. The structure of the score is module dependent and is accessible for students in Academic Information System. Assessment methods applied in the subjects of the SP include written and oral exams, intermediate exams, tests, defense of laboratory work reports, and defense of final thesis.

(2) Expert judgement/indicator analysis

The panel concludes that the broad scope of teaching/learning and assessment methods comply with the aims and outcomes of the SP quite well. The recently evolving situation caused by pandemics forced universities to shift towards remote teaching. In engineering fields where technological skills practicing is of paramount importance the adaptation to new circumstances is especially challenging. During the site visit, the faculty administration acknowledged that they see difficulties for in-laboratory teaching in the field of electrical engineering. Therefore, teaching and learning virtualization must not be underestimated in the near future strategies for the teaching/learning methods reworking, especially rethinking practical skills development techniques and their assessment methodologies.

3.1.5. *Evaluation of the totality of the field and cycle study programme subjects/modules, which ensures consistent development of competences of students*

(1) Factual situation

The study programme results are grouped to areas (1. knowledge and skills, 2. engineering analysis, 3. engineering design, 4. research, 5. engineering activities, and 6. personal/transferable skills), which are associated with the SP modules contributing to the achievement of each result in the matrix of relationship. Most of the general engineering and university subjects (Mathematics, Physics, Chemistry, Information Technologies, and Philosophy) are scheduled in the first part of the study plan. Electrical engineering and automation related subjects gradually increase in the upper semesters of the SP. Nevertheless, some specific electrical engineering study field modules are already included in the first semester (Metrology and Experimental Techniques), in the second semester (Analog and Digital Circuits), and the third semester (Synthesis and Simulation of Electrical Circuits). Topics of Electrical engineering and automation fields are extensively covered by the compulsory and elective courses (electrical circuits, electronics, optoelectrical systems, apparatus and sensors, microprocessors, electric drives, automatic control, electromagnetic field, programmable logic controllers, etc.). The SP also contains a relevant coverage of modules extending beyond electrical engineering subjects (Mechanics of Materials, Human safety, Economics, Electrical Energetics, Law and Standards in Electroenergetics, etc.). The SP evaluation conducted by the agency “Invest Lithuania” in 2020 referring to the needs of the manufacturing industry (which employs many of the SP graduates) paid attention that a stronger focus to engineering and manufacturing processes, integrated business process management, time and resources scheduling, and material management and planning would be beneficial for students.

(2) Expert judgement/indicator analysis

The panel thinks that the SP modules in the curriculum ensure consistent development of students’ competences. Nevertheless, some modules seem to lack coherence between the title

and the content. For example, in the module Analog and Digital Circuits (T190B127) any topic related to digital circuits is missing. Also, the changing landscape of the labour market and needs of local industries expect traditional competences of electrical engineers to be supplemented with knowledge of neighboring engineering fields (information & communication, mechanics, etc.) and manufacturing processes and quality management. Balancing between comprehensive coverage of traditional EE disciplines and expectations of employees is a challenge that needs to be continuously addressed by the SP architects. It can also be disputed if universities have to mainly aim at responding to the needs of local industry or step ahead by educating students for global innovative technologies that could open new opportunities for the country's society and economy. During the site interviews with alumni and social partners, sufficiency and relevance of theoretical knowledge provided by the SP was endorsed as well as graduates' abilities to learn operating specific industrial hardware systems within 6 to 9 months. An opinion was heard that more practical exercises with PLC controllers and electrical schematics drawing would be of interest, as well as addressing low current and security systems related topics along with more attention for (project) management skills.

3.1.6. *Evaluation of opportunities for students to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes*

(1) Factual situation

An opportunity for students to personalize the SP structure is supported by alternative and freely chosen study subjects, practice, projects, course work, and final thesis topic. It is said in SER that up to 26.7% of SP content can be personalized. There are 6 elective subjects embedded in the curriculum (one in the 3rd semester, 2 in the 4th semester, and 3 the 6th semester). The course work scheduled in the 6th semester can be chosen between Electrical and Mechatronic systems. Elective general courses (2 in total) can be selected by a student from all modules taught at the KU. Elective subjects (3 in total) can be chosen from the fixed list of modules. Typically, there are 3 to 5 alternative modules offered for students' selection. However, it was discovered after inspecting description of elective courses that some topics overlap in different courses. For example, Embedded Systems Programming (T120B054) and Internet of Things Systems programming (T120B116) modules address a lot of coinciding topics. The SP personalization opportunities also open the possibility to finish the SP ahead of time.

(2) Expert judgement/indicator analysis

Personalization opportunities in the SP planning seems sufficient and coherent with the intended learning outcomes. It was confirmed during the on-site interviews that due to the limited number of students in the SP maintaining a long list of alternative courses is not cost-effective. The statistics of selection of elective courses by students over the last years was not

presented. Analysis of content of some elective courses exposed some overlapping in the topics, which shrinks real opportunities of personalization.

3.1.7. *Evaluation of compliance of final theses with the field and cycle requirements*

(1) Factual situation

Final thesis (FT) topic can originated from teaching staff, social partners or a student himself. The summary of group of topics covered the last four years reveal that they were mainly attributed to control systems and robotics, electrical and electrical devices and systems, electronics. The quality of FT is assessed by FT Defense Commission which judges regarding the listed criteria, such as reliability of the methods and results obtained, degree of solution of the aim, validity of conclusions, their theoretical and practical significance, presentation and defense of the work, etc. FT defended by the SP graduates typically include state-of-the-art overview, engineering analysis, calculation and designing, conclusions, followed by a list of references. It is evident from the (2017-2020) presented FT copies that most of them target engineering design which is called project.

(2) Expert judgement/indicator analysis

The diversity of FT topics strongly correlate with the field of electrical engineering and the content covers many engineering subjects taught in the SP. It is noticeable however, that many of the theses reviewed by the panel lack description of the designed electrical system physical testing or verification by simulation. Meanwhile, the testing of a technical system is one of the key phases of engineering design flow. Non-accessibility of testing environments and budget constraints can definitely limit students' ability to fully test the designed engineering solutions. Nevertheless, composing a strategy for testing, simulation, partial modules testing, measurement or estimation of performance, designing of test benches, etc. would bring the thesis to the next quality level and closer to the real life engineering projects.

Recommendations for this evaluation area:

- Align the electrical engineering study programme with Klaipėda University's strategy aiming to head towards maritime technologies.
- Develop a plan for remote studies in the pandemics caused restrictions.
- Purify content of elective modules to avoid overlapping topics and ensure module titles alignment with the topics addressed in the curriculum.
- Stimulate addressing of testing and simulation phases of engineering design process in final thesis reporting.

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDY ACTIVITIES

Links between science (art) and study activities shall be assessed in accordance with the following indicators:

3.2.1. *Evaluation of the sufficiency of the science (applied science, art) activities implemented by the HEI for the field of research (art) related to the field of study*

(1) Factual situation

HEI research activities involving participation in international research and study projects, industrial projects are clearly visible from SER. Teachers of the SP focus on electric transport (including marine vehicles) and energy efficiency topics in research projects. KU was graded as "satisfactory research at the national level" by experts in 2018 evaluating university research and experimental development (R&D) activities. Research projects in the last five years are multidisciplinary and strongly related to the study field. The SP and recent research activities correlate quite well.

(2) Expert judgement/indicator analysis

Participation of the key personnel in scientific projects and activities is clear from information provided in SER. Nevertheless, the extent of engagement of teachers' of SP in research activities looks very heterogeneous. It has to be mentioned that scientific papers publishing rate is low in total as well as in terms of publications per year per person. Moreover, the key presented publications are in journals that are not in the field of EE, for example, Advances in Mechanical Engineering, etc. Despite the multidisciplinary nature of recent research, the visibility of achievements in the field of evaluation (EE) is critical in order to ensure sufficient relationship between research activities and the content of the FS. Attendance and presentation of research results at international scientific events, conferences, workshops, congresses, etc. organized by the leading organizations in EE field, publishing papers in high level journals, preferably extending cooperation with authors from other local and foreign institutions is mandatory keeping in mind the expectations to university level FS. Though the research quality is sufficient to the opinion of the panel, its long term sustainability is in danger without attracting more staff and broadening the research coverage in the field of EE.

3.2.2. *Evaluation of the link between the content of studies and the latest developments in science, art and technology*

(1) Factual situation

Research activities at KU Electrical and Electronics Engineering field was assessed in 2018 concluding that the scientific achievements are satisfactory at the national level. It was also find out that scientific projects are highly multidisciplinary and rather difficult to attribute to only the Electrical Engineering field. The SER refers to the strategic documents of KU when identifying key areas of the latest developments in science and technology. Energy efficiency,

decarburization, digital technologies, green ports, marine equipment, renewable energy, etc. are the areas relevant for the field of electrical engineering. Examination of description of courses of the SP curriculum has revealed that main references are dominated by the literature not later than around 2010. It was found common to see several books published in 199x included in the list of literature of many SP modules. Even modules covering a rather fast developing areas such as Robotics (modules Robotics, Robotic Embedded Systems) refers only to 2008 and earlier published teaching books. Despite a novel contents of some modules, for example Smart Sensors, the literature referred is outdated and little correlated with topics in the syllabus. Modules Internet of Things Systems programming and Embedded Systems Programming are much better constructed in terms of including recent subjects like IoT devices programming, wireless communication systems, etc. in the syllabus. However, sections and themes of these two elective modules and main references are highly coinciding. Referring to technological standards in modules is at a low level. For example, in the module Law and Standards in Electroenergetics only Lithuanian civil code and related documents are mentioned in the list of main references. Development of skills working with modern software tools are skipped or not disclosed in some modules' description. For instance, in the module Micro and Programmable Logic Controllers any of the development tools and software are mentioned in learning outcomes. During interview with students the panel heard the message that more practical exercises using programmable logic controllers is of interest. Meanwhile, in the module Digital Methods in Electrical Engineering so many of software simulation packages are addressed (MathCad, Matlab, Femm, Micro-Cap, Statistics, Simariss, Cosmos, Vissim) leaving some doubts regarding the depth of skills that can be gained during a single course and so many tools. In several modules, IEEE database is mentioned among main references. However, the subscription of this database is not available at KU. Topics of final theses provided with SER confirm that many of them target hot fields in electrical engineering. To mention a few, these are related to effective photovoltaic and solar/wind power systems, control systems for electrical vehicles, automation of production lines, electrical systems of marine boats, street lighting control, robot manipulators, smart grid storage, etc.

(2) Expert judgement/indicator analysis

Though SER has confirmed a good understanding of recent developments in the field by designers of the SP, the addressing of them in study modules is seen rather abrupt. For example, the panel found it difficult to locate smart grid related topics, energy efficiency, standardization, development of skills using up to date programming tools in the syllabus and learning outcomes of the SP modules. Titles of SP modules look relevant for the field, but main references are dated back more than a decade hardly can support strong links with latest developments in technology and science. Final thesis defended by graduates address recent activities in the field of EE quite well. KU involvement in EU CONEXUS Alliance for smart urban coastal development has a potential to positively impact HEI's involvement in cooperation with European universities in the field of education and research. However, the involvement of the researchers responsible for the implementation of EE SP and their

contribution to scientific research in the scope of the EU CONEXUS project was not discovered by the panel.

***3.2.3**. Evaluation of conditions for students to get involved in scientific (applied science, art) activities consistent with their study cycle*

(1) Factual situation

Several good examples of student involvement in research activities of the department are provided in SER: 2 students were involved in European INTERREG ELMAR project, 6 students were involved in Erasmus+ IESRES project activities, 3 students were involved in electrical bus development project during internship. Since 2017, 2 papers and 3 presentations were delivered together with the SP students at annual conference "Marine and Coastal Research" organized by KU. The SER team identifies students involvement in scientific work as a strength of the SP. KU holds and advertises the Robotics club (https://www.facebook.com/KURoboticsClub), which is relevant for the SP students extra curriculum practicing and experimentation. During the on-site meeting with the SP students, the impression was that they know about opportunities of involvement in scientific activities of the department but the motivation is lacking. Closing of laboratories because of the pandemic restrictions is seen as unfavorably affecting possibilities to get involved in extra curriculum activities.

(2) Expert judgement/indicator analysis

The conditions for students' involvement in research activities at the University and the department seems good to the opinion of the panel. Several nice research and development contributions of students, for example, designing electrical bus, were stressed by the SER team and was visible in the department facebook posts. Nevertheless, students participating in the meeting with the panel (mainly the first and the fourth study year) witnessed that they are consulted by teachers but not involved in scientific research referring to the close of laboratories due to pandemic restrictions. The lack of motivation from student side was sensed during on-site conversation. The panel did not receive any students' opinion regarding the attitude towards scientific research. Some students expressed they are undecided whether to seek for master degree because of uncertain feeling to continue studies in the future.

Recommendations for this evaluation area:

- Take actions to intensify research activities in the field of electrical engineering, mainly by ensuring broader engagement of the study program teachers and build plans for attracting more research active staff.

- Review main references of all study modules and strengthen the link between latest developments in the science and technology field of electrical engineering and content of modules.
- Explore the reasons of moderate motivation of students to contribute to research activities of the department and plan measures how to inspire their involvement.

3.3. STUDENT ADMISSION AND SUPPORT

Student admission and support shall be evaluated according to the following indicators:

3.3.1. *Evaluation of the suitability and publicity of student selection and admission criteria and process*

(1) Factual situation

The first cycle Electrical engineering study program study modes, language (in 2021 Lithuanian only) and the department responsible for implementation are published in the "Rules for the admission of students to KU in 2021". This document also describes secondary school subjects and their corresponding weights used to calculate competitive admission scoring. KU adheres to the student admission procedure implemented by Lithuanian Association of Higher Education Institutions. The secondary school graduation subjects applicable for admission scoring for every study field are tabulated in the document released and annually updated by the Lithuanian Universities Rector's Conference. Both documents are available at KU web site https://www.ku.lt/studijos/studiju-skyrius/stojantiems-2021/. The minimal competitive score for Electrical engineering field (5.4 in 2020) along with the other condensed requirements relative to the field are also published on the web page of the SP implementing department (https://www.ku.lt/priemimas2020/priemimas-i-ku-studijas/bakalauro-studijos-2020/elektros-inzinerija/#priemimo-salygos-tab). Number of students admitted to Electrical engineering program in 2020 (9 students) is visible from the list of all SPs admission results table at the same web page. According to the SER, in 2020 6 students in full-time mode and 2 students part-time mode to state funded places were admitted, while 1 student is admitted to the non-state-funded place.

(2) Expert judgement/indicator analysis

The declining demographic indicators are hitting many of the country's institutions including universities. KU is struggles competing with local universities and colleges for attracting students. Over the last several years, national Education ministry increasing minimal competitive score and declining grades of pupils from secondary schools also negatively impact admission perspectives to the SP. A critically small number of applicants to the study programme is definitely threatening its continuation (in 2018 and 2019, no academic group was composed due to the insufficient number of applicants). In 2020, among applicants to the SP only 4 students applied pointing the program as the first priority (2 admitted), while other

priorities include 19 applicants (7 admitted). On the other hand, the new appointment of government scholarship for all students entering engineering programs at regional HEIs together with other measures undertaken by KU seems to be having a positive push on students' admission. KU has presented an ambitious publicity plan that includes cooperation with secondary schools. In order to raise the number of admitted students to a more sustainable level, these efforts need to be continued. Cooperation with schools in earlier years of study, to increase younger pupils' interest in (electrical) engineering, should be explored. Also, cooperation with companies in the publicity efforts should be increased.

3.3.2. *Evaluation of the procedure of recognition of foreign qualifications, partial studies and prior non-formal and informal learning and its application*

(1) Factual situation

In the English version of KU web site Electrical Engineering SP is promoted. The procedures for recognition of foreign qualifications, partial studies and non-formal and informal learning are established and applied in KU. The evaluation is carried out by assessing provided documents by applicants and no special examination or equalization courses are mentioned in the SER.

(2) Expert judgement/indicator analysis

In the last five years foreign applicants were not admitted to the SP due to the small number of applicants that was insufficient to compose an academic group. It is indicated on the web page of the department that some study modules can be given in English. This perhaps confirms that Erasmus exchange students can be accepted but the full-time studies are not implemented. Nevertheless, it is reported that in 2018 3 students graduated in English.

3.3.3. *Evaluation of conditions for ensuring academic mobility of students*

(1) Factual situation

Students' mobility is mainly accessible in the framework of European Erasmus+ program. It is stated in the SER and confirmed by interviewing students during on-site meeting that the University promotes Erasmus+ opportunities continuously. Incoming students (15 in the period 2017-2020) significantly outnumber the outgoing students (4 in the period 2017-2020). The most often incoming students came from France, Belgium and Turkey.

(2) Expert judgement/indicator analysis

A small number of students in the SP (in 201-2020 in total 32 graduates were reported in the SER) means only a few Erasmus visits per last five years (4 students). Meanwhile, the opportunities and procedures to apply for Erasmus+ visits seems clearly established and

promoted. It was found during the meeting with students that some of them do not feel confident to go alone for a semester study abroad. It was evident from discussions that insufficient English language knowledge might be one of the reasons. In this sense, more encouragement, support and personal explanations of benefits for studying a semester in the other environment could be suggested seeking to stimulate student motivation. Through EU-CONEXUS project more virtual mobility opportunities are offered to students, which is a positive development, as long as efforts to increase physical mobility continue as well..

3.3.4. *Assessment of the suitability, adequacy and effectiveness of the academic, financial, social, psychological and personal support provided to the students of the field*

(1) Factual situation

A wide spectrum of scholarships is available for the KU students according to Lithuanian laws and include incentives, support for disabled persons, and one-time scholarship to support research and other activities, as well as annual scholarships from companies. Starting from 2020, every student in the engineering study field at regional Universities (including KU) is appointed 200 EUR monthly scholarship by the Education Ministry for the duration of the whole study period. The University has sport clubs and art assemblies, student organizations where students can enrich their social life. During the on-site discussions with administration it was confirmed that KU has a full time working psychologist providing students' consultation on demand. Academic support also includes curator services for the first year students, consultation from teachers. The summer semester is available to students unable to complete the study plan, due to circumstances beyond their control.

(2) Expert judgement/indicator analysis

The panel judges that students' academic, financial, social support is adequate and suitable. The appointment of scholarship from government for the whole study period is seen as an important factor to restore the admission of students to the program in 2020. Despite many other financial support options, the factual SP students' access to scholarship and funds for project development is not reported in the SER. Given the high demand of engineers by local industrial partners, grants establishment is still a measure not fully exploited for support of the SP students. A member of the panel has found it easy to locate contacts for psychologist and pastoral support advertised on the KU web site. Some faculty's efforts to evaluate the effectiveness of academic support provided to students can be presumed from a question targeting the usefulness of teachers extra time consulting. Nevertheless, a broader view support efficiency assessment was not evidenced by the panel.

3.3.5 *Evaluation of the sufficiency of study information and student counselling*

(1) Factual situation

Student counselling is started from the first week of studies at KU. Introductory lectures are organized by the faculty at the beginning of the first semester. Curators are appointment to facilitate students' involvement to the activities of KU community. Career guidance is provided by career counsellor and lecturers of the programme. Study information is disseminated to students in academic information system and virtual learning environment, as well as by faculty administration. Information of academic mobility is regularly advertised every semester. Graduates survey results confirm that some students liked the department help in organizing professional practice.

(2) Expert judgement/indicator analysis

Bearing in mind the small number of enrolled students, a reliable judgement regarding the sufficiency of counselling is complicated. Students participating in the meeting with the expert panel did not express any deficiency of study information dissemination. However, they did not seem to be aware of the support services offered by the university besides consultations from teachers. While the relationship between students and teachers seems to be strong, other support services should be highlighted to the students as well.

Recommendations for this evaluation area:

- In order to raise the number of admitted students to a more sustainable level, KU's publicity efforts need to be continued. Cooperation with schools to increase younger pupils' interest in (electrical) engineering, should be explored. Also, cooperation with companies in the publicity efforts should be increased.
- Students' English language has to be polished to encourage them for semester studies according to international exchange programs along with explanations of benefits gained from international experiences.
- The SP students should be made more aware of the various support services that are offered to them by the university.

3.4. STUDYING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

Studying, student performance and graduate employment shall be evaluated according to the following indicators:

3.4.1. *Evaluation of the teaching and learning process that enables to take into account the needs of the students and enable them to achieve the intended learning outcomes*

(1) Factual situation

Every study module description includes methods of studying, amount of independent study hours, weeks for necessary submissions, assessment and cumulative score. Lectures, exercises, problem solving, laboratory works and report preparation, individual consultations, seminars, literature analysis, use of specific software, excursions to companies are the teaching methods applied in the SP. The needs of students are served by providing them with

opportunities to choose topics for individual tasks and presentations, course projects, final thesis, practice, elective modules. Course projects are used to develop skills of working in teams. Assessment methods used in the SP include written and oral exams, tests, colloquia, laboratory works, course projects, final theses defense. Delayed students can use a 4-week summer semester to complete subjects that they were unable to attend due to objective reasons, like illness. According to Study Regulations of KU, postponing or advancing time of work defenses and exam session can be granted. Graduates can continue to study for Master degree at KU and other universities in Vilnius or Kaunas cities. The program has full-time and part-time modes. The second one lasts 5 years compared to 3.5 years of the full-time mode.

(2) Expert judgement/indicator analysis

The panel assumes that teaching and learning process is suitable for the achievement of the intended learning outcomes. Specific needs of students can be related to their field of interest or due to difficulties in achieving learning outcomes. The first is well addressed by allowing to choose the topic of interest for course projects, individual tasks, presentations, final thesis. Also, five elective courses are available during three semesters in the SP. The list of modules for choosing elective courses is adjusted to the intended learning outcomes of the SP. Students that are employed in the labour market are offered part-time studies that enable to combine work and studies easier.

3.4.2. *Evaluation of conditions ensuring access to study for socially vulnerable groups and students with special needs*

(1) Factual situation

KU maintains various facilities that are adapted for students with mobility, visual or hearing impairments. For example, elevators in buildings, toilets for people with special needs, programs for text translation to audio in library, special computer peripherals for people with motoric and seeing problems (printers, magnifiers, keyboards, etc.). KU website has a version for visually impaired people. Most of the auditorium and laboratories used in Electrical engineering study program are on the 4th floor of the building and cannot be reached by people using special wheelchairs. Nevertheless, options for bringing necessary equipment to the ground floor are considered. KU owned dormitories are available for the students. The priority to rent a dormitory is given to the socially vulnerable groups. KU web site says that some rooms in dormitories are adapted for students with movement disabilities.

(2) Expert judgement/indicator analysis

The panel thinks that conditions for people with special needs are adequate. Over the last 10 years, no students with disabilities were enrolled in the EE programme. Therefore, any insufficient conditions for their support were not identified.

3.4.3. *Evaluation of the systematic nature of the monitoring of student study progress and feedback to students to promote self-assessment and subsequent planning of study progress*

(1) Factual situation

Collection of the SP feedback is regulated by procedures approved by the Rector of KU in 2019. The feedback concerning separate study modules, internships, and opinion of graduates is acquired periodically. The administrator of the faculty is responsible for organizing surveys. Graduates surveys (results are included in SER) are organized every three years. Feedback results are analyzed by the Study Committee of Electrical engineering SP. Improvements of study quality based on the findings from surveys include introduction of new modules (two new modules are mentioned in SER), topics, and laboratory works. In addition to that, the feedback results are influencing teachers' certification and competition.

(2) Expert judgement/indicator analysis

The drop-out rate of students is typically high in engineering studies. SER provides only numbers of admitted and graduating students over 2017-2020. Since admitted in 2017 students graduate at 2021, the drop-out rate is not possible to assess. However, during discussion with the SER preparation team around 30 % drop-out rate was given. It was said that it was mainly in part-time study form. The panel thinks that for the SP with a small number of students this drop-out rate is high. The reasons for drop-out of students were not explored by the department. The panel thinks that the high rate of students' employment during studies could be one of the factors. Monitoring of student progress during a semester and measures to assist them in dealing with delays or non-achieved results were not evidences, except individual consultations from teachers of modules. Due to the small number of students in the SP and seeking to increase the reliability of results conducting graduates surveys annually is beneficial.

3.4.4. *Evaluation of the feedback provided to students in the course of the studies to promote self-assessment and subsequent planning of study progress*

(1) Factual situation

Surveys are conducted annually to collect feedback from students about the SP and quality of studies. The gathered information is used to improve the programme and individual modules. It seems that self-assessment and study planning are discussed individually between a teacher of the module and a student.

(2) Expert judgement/indicator analysis

Having in mind a small number of students enrolled in SP, the percentage of students taking part in surveys is critical to acquire statistically reliable data. It is not elaborated which techniques are applied to motivate students to respond. The panel did not clearly evidenced

which way the feedback evaluation is reported back to students. Participating in the interview students confirmed that they are basically satisfied with the general procedures and support at KU. Most of the time they solve all rising issues by consulting their professors. They were also able to name some topics they would like to be addressed in the curriculum.

3.4.5*. Evaluation of employability of graduates and graduate career tracking in the study field*

(1) Factual situation

Graduates are employed immediately after the finish of studies or even during studies. Surveys conducted by Government Strategic Analysis Center STRATA indicate, that in the period 2017-2020 100% of KU Electrical engineering SP graduates were employed or continued studies. The SER also indicated, that employment of students of the last study year is a common practice. During on-site interview, alumni and social partners acknowledged the need of labour market for electrical engineers in the region. Industrial social partners confirmed that theoretical knowledge of graduates is good, while it takes some reasonable time (6 to 9 month) in companies to achieve practical skills demanded in various positions.

(2) Expert judgement/indicator analysis

Definitely high employment figures of the SP graduates confirms the strong need for employees in the EE field in the Klaipėda region. Nearly half of the graduates' employment is classified as 'low-skilled'. It turned out during the on-site meeting with employers that usually a hired person starts at low positions (e.g. technician) but dependent on personal features he or she progresses to a much higher position within 6 to 9 months. Sometimes, staying in a low-skilled position is related to the unwillingness of employees to take higher responsibilities in companies. To get more accurate information about this, the university could track graduates over a longer time, e.g. by collecting data about graduates' positions after two or three years.

3.4.6. *Evaluation of the implementation of policies to ensure academic integrity, tolerance and non-discrimination*

(1) Factual situation

Policies to ensure academic integrity, tolerance and non-discrimination are outline in KU Code of Academic Ethics highlighting academic cooperation and transparency. Students' personal data protection is well apprehended and stated in the Code.

(2) Expert judgement/indicator analysis

Instruments used to verify all student works against plagiarism and methodologies to verify student's works are not elaborated in SER, however students confirmed during the on-site visit their awareness that certain tools are present and in use.

3.4.7. *Evaluation of the effectiveness of the application of procedures for the submission and examination of appeals and complaints regarding the study process within the field studies*

(1) Factual situation

Procedures for submission and examination of appeals and complaints are established at university level by internal study regulations of 2018. There were no written appeals filed in EE SP over the period of evaluation.

(2) Expert judgement/indicator analysis

Availability of formal regulations to appeal and complain officially and direct cooperation of university personnel with students indicate effective management of possible disagreements.

Recommendations for this evaluation area:

- Monitoring of student study progress in the scope of one course, one semester, etc. along with options to deal with delays and failures to achieve intermediate results should be made clearer.
- Due to the small number of graduates it is recommended to conduct their surveys annually. Also, longer period graduates carrier tracking is advisable.
- To get more accurate information about the types of positions graduates end up, the university could track them over a longer time, e.g. by collecting data about graduates' positions after two or three years.

3.5. TEACHING STAFF

Study field teaching shall be evaluated in accordance with the following indicators:

3.5.1. *Evaluation of the adequacy of the number, qualification and competence (scientific, didactic, professional) of teaching staff within a field study programme(s) at the HEI in order to achieve the learning outcomes*

(1) Factual situation

In total 15 teachers are listed as contributing to electrical engineering study program including two professors, four associate professors, and two lectors with doctoral degree. Three teachers are employed part-time. Years of pedagogical work experience of teachers ranges between 30 and 1 year, with 9 teachers having more than 10 years of experience. Eight

teachers have more than 5 years of practical work experience in the field of taught subjects. The average age of employees lecturing at the SP is 45 years. Fields of research interests of the teachers and publishing of research works are related not only to the field of electrical engineering (electric machines and drives, mechatronic systems, electromagnetic fields, renewable energy, green transport) but also spans neighboring engineering fields (IT systems, technological process, modelling mechanical systems). Didactic materials prepared by the SP teachers over the last five years are not reported. Two teachers have not provided any work published over the last five years, one lecturer published his last paper in 2015, and main works of two other lecturers are listed without date in SER. Two teachers from the list were not listed as responsible for any module in curriculum. The panel found, that there are no strict requirements for pedagogical qualifications when appointing teachers, but their pedagogical experience is discussed during the evaluation of candidates.

(2) Expert judgement/indicator analysis

The number of teachers responsible for EE field subjects' implementation is critically low considering the extent of their contribution to the SP. For example, two key teachers are coordinating or contributing to 19 courses listed in the study plan. Though only one person from the teaching staff is close to the retirement age, her contribution to the programme is dominant. The panel heard during the on-site meeting with the staff that limited budget and small number of students makes it attracting of more teachers very challenging. Absence of PhD studies in the field of EE at KU, insufficient means of motivation are yet other factors making the hiring of teachers even more difficult. The department administration mentioned that they consider cooperation with universities from Vilnius and Kaunas. The panel thinks, that risk analysis of SP implementation and measures of mitigation in case of even temporary drop-out of key teachers is relevant. Handover scenarios of main EE field mandatory courses have to be modelled in advance seeking to ensure SP resistance to staff rotation. Qualification and competences of key teachers conducting the SP are undoubted. However, the panel judges that scientific and didactic publishing activity of a considerable part of lecturers is quite low.

3.5.2. *Evaluation of conditions for ensuring teaching staffs' academic mobility (not applicable to studies carried out by HEIs operating under the conditions of exile)*

(1) Factual situation

Academic mobility of teaching staff is implemented using Erasmus+ visits and meetings in the scope of research and education projects. Some teachers are active in academic mobility and engagement in research projects. In the period 2017-2019, 8 Erasmus teaching visits by 4 lecturers, 5 visits to project (Interreg ELMAR, SEAGLE) partners, and one internship are reported. Countries visited include not only the Baltic region, but also Greece, Turkey, Germany, Spain, Switzerland, Norway. In total 6 teachers participated in teaching and dissemination activities over the reported period.

(2) Expert judgement/indicator analysis

Mobility of the study program lecturers is noticeably uneven and range from rather high to non-reported over the period of the last four years. Even though there were no complaints heard about insufficient conditions for teaching stuff mobility during on-site interviews, the panel assumes that there could be various reasons for low involvement of part of the lecturers (10 out of 15 contributing to the SP teachers did not participate in any mobility event over the reported period 2017-2019). These reasons might be related to the lack of substituting lecturers during a mobility visit, insufficient motivation of teachers, their inability to combine visit schedule with the institutions of secondary employment (for part-time employed personnel), insufficient English language skills (some teachers need a translator during on site interview). Therefore, the panel assumes that mobility conditions are only partially developed.

3.5.3. *Evaluation of the conditions to improve the competences of the teaching staff*

(1) Factual situation

Staff qualification improvement is mainly achieved by participating in national and international projects. Also, some examples of attending professional development courses were seen (one massive online course in the field of IT systems deployment completed). In total, 5 teachers were seen in the record of participation in academic exchange in the period 2017-2019. It was found during the site visit that the SP teachers have received extensive training in English language, project management, teaching methods in the framework of EU-CONEXUS project.

(2) Expert judgement/indicator analysis

Despite the efforts to advertise research project calls, requirements laid in the competition and attestation rules of KU, the staff involvement in academic exchange, projects, scientific research and publishing, participation in conferences and competences improvement is heterogeneous. Two teachers' reported academic exchange activity include 11 visits to foreign partnering institutions, while the rest of the SP teachers (13) report only 3 visits in total in the period of 2017-2019. It may be due to the lack of motivation, high teaching load or load of employees in other employment organizations and study programs. Though the university established a scientific research and study fund for academic staff, a rather low exchange and mobility rate of most of the teachers (despite a few exceptions) makes the panel to think that the fund was not utilized sufficiently by the staff working in the field of electrical engineering.

Recommendations for this evaluation area:

- Prepare plan for handover of key electrical engineering study courses and gradual replacement of teachers approaching retirement age.
- Motivate and demand homogeneous involvement of staff in scientific research, academic mobility, competences related to the field of electrical engineering and academic mobility.

3.6. LEARNING FACILITIES AND RESOURSES

Study field learning facilities and resources should be evaluated according to the following criteria:

3.6.1. *Evaluation of the suitability and adequacy of the physical, informational and financial resources of the field studies to ensure an effective learning process*

(1) Factual situation

A large renewal and acquisition of new laboratory equipment took place in 2014. In the video materials supplemented to SER, laboratories equipped with teaching stands, measurement equipment, power supplies, automation systems including programmable logic controllers, sensors and actuators, pneumatic installations, electrical drives, electronics, computers, 3D printer, etc. were observed. Software from Lenze and Siemens for industrial automation equipment programming is available in laboratories. Equipment from companies like ABB, Festo were present in laboratories. Robotics laboratory is supplied with materials, tools and parts necessary for constructing robotic systems. Most of the meters in the Electrical engineering laboratory were based on analog displays, but computers were connected to measurement stands, too. Electronics laboratory was equipped with variety of teaching kits and testing benches. Control laboratory contains a more complex stands including pneumatic actuators. Mechatronics laboratory is accommodated for both practicing with teaching stands and attending seminars or lectures. Smart boards were present in many of the classes. Specialized software used in the teaching process include Matlab, Labsoft, Solid works, KiCAD and other. KU library literature is replenished annually. Electronic databases of research articles and books in the Electrical Engineering field are available for students and staff due to KU participation in the project implemented by the Lithuanian Association of Research Libraries and the EU. There are many companies that accept students of Electrical Engineering for the internship.

(2) Expert judgement/indicator analysis

Learning facilities and resources in laboratories are in a good shape and serve for the achievement of the SP outcomes. Devices from leading companies in industrial automation are available for learning needs at laboratories. Stands in laboratories are suitable for implementing various control systems including electrical drives, pneumatic actuators, programmable controllers which are extensively used in the industry nowadays. Local companies accepting students for internship operate variety of industrial installations helpful

for visiting students' practical skills development. By reviewing the flow of posts in the department's facebook account (https://www.facebook.com/inzinerijoskatedra) a constant students' and staff visits to premises of industrial partners was evidenced by a member of the panel. During on site interviews, participating students acknowledge a very good infrastructure at the university. Unfortunately, KU does not have a subscription to important scientific databases in the field of electrical engineering like IEEExplore. This of course limits accessibility of the most recent developments and research directions in field for both teachers and students.

3.6.2. *Evaluation of the planning and upgrading of resources needed to carry out the field studies*

(1) Factual situation

The department plans to establish a robotics laboratory. Any more detailed planning for upgrading teaching materials is not reported. During the site meeting with the administration of the faculty, the discussion regarding adaptation of the study process to pandemic restrictions was held. Faculty representatives acknowledged that practical teaching in electrical engineering is difficult due to closed laboratories and software simulation is seen as a solution.

(2) Expert judgement/indicator analysis

A rather small number of enrolled students and the government policy to allocate institution budget dependent on their number negatively impacts the department's ability to acquire new teaching material and equipment. The panel did not evidenced if any laboratory engineers are hired by the department to maintain teaching laboratories and consulting students coming to open laboratories. The panel did not hear a strong message about how the department plans to ensure teaching of practical laboratory skills in the quarantine restriction conditions. Therefore, laboratory virtualization plan has to be drawn for the future practical teaching.

Recommendations for this evaluation area:

- Think how to provide staff and students with access to IEEE databases or selected IEEE journals considering their high-quality and leading reputation within the Electrical and Electronic Engineering field.
- Develop a plan for virtualization or remote operation of laboratories in order to mitigate impact of quarantine caused restrictions on the achievement of learning outcomes.

3.7. STUDY QUALITY MANAGEMENT AND PUBLICITY

Study quality management and publicity shall be evaluated according to the following indicators:

3.7.1*. Evaluation of the effectiveness of the internal quality assurance system of the studies*

(1) Factual situation

The quality assurance system is established at KU and adheres to ISO 9000 standard. The chapter "Internal study quality assurance" of the publicly accessible KU Study regulations is devoted to the policy of quality management at the University. A wide spectrum of periodic activities (surveys, questionnaires, meetings, interviews, invitations to qualification commissions, etc.) for the study process and demands of students' and social partners' data collection is stated. KU carries out 6 types of research involving opinions of students', graduates', administrative staff and lecturers', aiming at finding information relevant to the study quality activities at the University. The Electrical engineering SP quality assurance responsibilities are distributed among the Faculty Dean and Vice-Rector for Studies, Committee of Electrical and Electronics Engineering Study Area (SFC), Head of the Study Program, KU Study Quality Commission, and Faculty Council. Every three years the internal SP self-evaluation is performed. Head of the Study Program is responsible for the proper implementation and improvement of the study program. Quality of teaching modules is maintained by coordinating teachers.

(2) Expert judgement/indicator analysis

Traditional quality assurance framework widely used in Lithuania HEIs is adapted at KU. The panel judges that formally the internal study quality management system is established at the University and the Electrical engineering SP quality assurance is implemented by following its guidelines. Also, the faculty administration organizes surveys for the graduates of the SP every three years. The SER states and the panel experts heard the confirmation from administration and teaching staff that all the collected data is discussed at Dean office and department meetings twice or once per semester dependent on information collected (quality of modules, final thesis, internship, etc.). What was less clear is which particular measures were recently taken based on the discussions and how documenting of plans and the follow-up evaluation is used in order to assess the success of these measures. The SER says that the summarized information from internal research including study quality issues is provided publicly on the KU website in the annual KU reports (https://www.ku.lt/apie-universiteta/veiklos-dokumentai/). However, the panel member was unable to find any specific information related to quality improvement of Electrical engineering SP over the 2017-2019 years.

3.7.2. *Evaluation of the effectiveness of the involvement of stakeholders (students and other stakeholders) in internal quality assurance*

(1) Factual situation

Students participate in internal quality assurance by responding to surveys and questionnaires about study subjects and the SP. Students and representatives from companies are included in the Committee of Electrical and Electronics Engineering Study Area and participate in making decisions for quality improvement. The Student Union is organizing meetings and discussions to bring quality issues. Industrial partners participated in the SP evaluation coordinated by VšĮ "Invest Lithuania" and aimed to assess the SP conformance to the needs of investors. As a result, an extensive outline of measures together with responsible people and implementation deadlines was composed in 2020 June. The implementation of the planned improvements has just started recently.

(2) Expert judgement/indicator analysis

During the site meeting, both social partners and students indicated that they can express their needs by directly contacting faculty Dean and/or SP professors. However, the students did not seem to be aware of channels to express opinions or problems aside from contacting teachers and the surveys. The general atmosphere in the interview with students was that most of the issues are handled informally with the assistance of faculty administration or teachers. Some social partners participating in the on-site interviews confirmed they are actively involved with the SP implementers and feel satisfied with the cooperation. Nevertheless, none of the invited to the meeting social partners were able to comment on the self-evaluation report prepared by the team of the department.

3.7.3. *Evaluation of the collection, use and publication of information on studies, their evaluation and improvement processes and outcomes*

(1) Factual situation

The department discusses study program quality twice a semester. SER states that studies, their evaluation, improvement processes, developments and future intentions related information is disseminated to students, lecturers and administration orally in meetings. The faculty and the department externally accessible web site does not publish information related to the SP evaluation and improvement processes and outcomes. The link to the conclusions of external SP evaluation carried out in 2014 is broken in the KUs web site.

(2) Expert judgement/indicator analysis

It is to be noticed that according to the conducted survey of graduates in 2020, the sufficiency of email publications was graded rather weakly (3.5 in the scale of 0 to 5). This may indicate willingness of the students for the improvement of formal communication. Though collection

of data and inputs from stakeholders is clearly described in SER, however the reporting of measures implemented to address the inputs is not clear to the panel. Any publications on the SP quality improvement was not located by the panel member on the faculty and department's web and facebook pages.

3.7.4. *Evaluation of the opinion of the field students (collected in the ways and by the means chosen by the SKVC or the HEI) about the quality of the studies at the HEI*

(1) Factual situation

According to graduates opinion survey conducted by the faculty in 2020' regarding the SP and various quality criteria (37 items in total), the range of average grades is from 3.5 to 5 in the scale of 0 to 5. Unfortunately, the number of students that took part in the survey is only 2, making the results of the survey statistically non-reliable. Sadly, none of KU Electrical engineering SP students took part in the NSA survey launched by SKVC.

(2) Expert judgement/indicator analysis

A small number of graduates in the SP survey conducted in 2020 is hardly sufficient to acquire a reliable feedback. Therefore, the process of collecting and evaluation of the opinion of the field students seems underdeveloped.

Recommendations for this evaluation area:

- Improve the public dissemination of measures implemented to address the needs of stakeholders of the study programme.
- Students should be made more aware of channels to express their opinion or possible problems, like the existence of student representatives.
- The department should increase efforts to get more answers to the surveys they organize, so they can collect statistically significant data.

IV. EXAMPLES OF EXCELLENCE

Core definition: Excellence means exhibiting exceptional characteristics that are , implicitly, not achievable by all.

None.

V. RECOMMENDATIONS

1. Align the electrical engineering study programme with Klaipėda University's strategy aiming to head towards maritime technologies.
2. Develop a plan for remote studies in the pandemics caused restrictions.
3. Purify content of elective modules to avoid overlapping topics and ensure module titles alignment with the topics addressed in the curriculum.
4. Stimulate addressing of testing and simulation phases of engineering design process in final thesis reporting.
5. Take actions to intensify research activities in the field of electrical engineering, mainly by ensuring broader engagement of study program teachers and build plans for attracting more research active staff.
6. Review main references of all study modules and strengthen the link between latest developments in the science and technology field of electrical engineering and content of modules.
7. Explore the reasons of moderate motivation of students to contribute to research activities of the department and plan measures how to inspire their involvement.
8. In order to raise the number of admitted students to a more sustainable level, KU's publicity efforts need to be continued. Cooperation with schools to increase younger pupils' interest in (electrical) engineering, should be explored. Also, cooperation with companies in the publicity efforts should be increased.
9. Students' English language has to be polished to encourage them for semester studies according to international exchange programs along with explanations of benefits gained from international experiences.
10. The SP students should be made more aware of the various support services that are offered to them by the university.
11. Monitoring of student study progress in the scope of one course, one semester, etc. along with options to deal with delays and failures to achieve intermediate results should be made clearer.
12. Due to the small number of graduates it is recommended to conduct their surveys annually. Also, longer period graduates carrier tracking is advisable.
13. To get more accurate information about the types of positions graduates end up, the university could track them over a longer time, e.g. by collecting data about graduates' positions after two or three years.
14. Prepare plan for handover of key electrical engineering study courses and gradual replacement of teachers approaching retirement age.
15. Motivate and demand homogeneous involvement of staff in scientific research, academic mobility, competences related to the field of electrical engineering and academic mobility.

16. Think how to provide staff and students with access to IEEE databases or selected IEEE journals considering their high-quality and leading reputation within the Electrical and Electronic Engineering field.
17. Develop a plan for virtualization or remote operation of laboratories in order to mitigate impact of quarantine caused restrictions on the achievement of learning outcomes.
18. Improve the public dissemination of measures implemented to address the needs of stakeholders of the study programme.
19. Students should be made more aware of channels to express their opinion or possible problems, like the existence of student representatives.
20. The department should increase efforts to get more answers to the surveys they organize, so they can collect statistically significant data.

VI. SUMMARY

As evident from the SER and discussions with study program social partners, engineering graduates including automation, robotics and electrical engineers in Western Lithuania are highly in demand. Electrical engineering is a key field of technology for manufacturing, energy, transportation industries that are expanding in the region. The aims and outcomes, theoretical knowledge and skills of graduates of the study program are sufficiently aligned with the expectations of employers.

Electrical engineering field of study in the whole KU landscape is somewhat submerged in interdisciplinary projects and research areas, but its visibility and publicity should be elevated.

A small number of admitted students impose the biggest risk for the program implementation quality and sustainability. In 2020, scholarships introduced by the government for the students entering engineering studies accompanied with promotion of engineering fields and cooperation with schools and stakeholders allowed to step over the required threshold for the number of admitted students.

Teaching staff resources are also limited due to the small number of admitted students. Despite the acceleration of international cooperation and research projects in the department and the University, the staff contribution in research activities and the program implementation is rather heterogeneous.

Student willingness to gain international practice is rather low. Student English has to be polished to encourage them for semester studies according to international exchange programs.

Program quality management is satisfactory with a minor emphasis on improvement of dissemination of actions and measures implemented to address the needs of stakeholders of the study programme and of informing student more about ways to participate, including increasing the response rate to surveys.

Expert panel:

1. **Prof. Dr. Laszlo Tamas Koczy (panel chairperson)** *academic,*
2. **Prof. Dr. Toomas Rang,** *academic,*
3. **Prof. Dr. Žilvinas Nakutis,** *academic,*

4. **Dr. Matthew Armstrong,** *academic,*
5. **Dr. Andrius Šablinskas,** *representative of social partners'*
6. **Mr. Ruben Janssens,** *students' representative.*