SKVC

STUDIJŲ KOKYBĖS VERTINIMO CENTRAS
CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

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ELECTRONICS ENGINEERING FIELD OF STUDY

at Kaunas University of Technology

EXTERNAL EVALUATION REPORT

Expert panel:
1. Panel chair: Prof. László T. Kóczy, DSc ………………………... (signature)
2. Academic member: Prof. Yevhen Yashchyshyn
3. Academic member: Dr. Olev Märtens
4. Social partner representative: Šarūnas Venslavas
5. Student representative: Gabija Šliužaitė

SKVC coordinator: Gabrielė Čėplaitė

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CONTENTS

I. INTRODUCTION

1.1. OUTLINE OF THE EVALUATION PROCESS

The field of study evaluations in Lithuanian higher education institutions (HEIs) are based on the following:

- Procedure for the External Evaluation and Accreditation of Studies, Evaluation Areas and Indicators, approved by the Minister of Education, Science, and Sport;
- Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (SKVC);
- Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).

The evaluation is intended to support HEIs in continuous enhancement of their study process and to inform the public about the quality of programmes within the field of study.

The object of the evaluation is all programmes within a specific field of study. A separate assessment is given for each study cycle.

The evaluation process consists of the following main steps: 1) Self-evaluation and production of a self-evaluation report (SER) prepared by an HEI; 2) A site visit by the review panel to the HEI; 3) The external evaluation report (EER) production by the review panel; 4) EER review by the HEI; 5) EER review by the Study Evaluation Committee; 6) Accreditation decision taken by SKVC; 7) Appeal procedure (if initiated by the HEI); 8) Follow-up activities, which include the production of a Progress Report on Recommendations Implementation by the HEI.

The main outcome of the evaluation process is the EER prepared by the review panel. The HEI is forwarded the draft EER for feedback on any factual mistakes. The draft report is then subject to approval by the external Study Evaluation Committee, operating under SKVC. Once approved, the EER serves as the basis for an accreditation decision. If an HEI disagrees with the outcome of the evaluation, it can file an appeal.On the basis of the approved EER, SKVC takes one of the following accreditation decisions:

- **Accreditation granted for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points), or good (3 points).
- **Accreditation granted for 3 years** if at least one evaluation area is evaluated as satisfactory (2 points).
- **Not accredited** if at least one evaluation area is evaluated as unsatisfactory (1 point).

If the field of study and cycle were **previously accredited for 3 years**, the re-evaluation of the field of study and cycle is initiated no earlier than after 2 years. After the re-evaluation of the field of study and cycle, SKVC takes one of the following decisions regarding the accreditation of the field of study and cycle:

- To be accredited for the remaining term until the next evaluation of the field of study and cycle, but no longer than 4 years, if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).
- To not be accredited, if at least one evaluation area is evaluated as satisfactory (2 points) or unsatisfactory (1 point).

1.2. REVIEW PANEL

The review panel was appointed in accordance with the Reviewer Selection Procedure as approved by the Director of SKVC.

The composition of the review panel was as follows:

1. Panel chair: Prof. László T. Kóczy, DSc, Professor at Budapest University of Technology and Economics and Member of the Hungarian Higher Education Accreditation Committee (HAC);
2. Academic member: Prof. Yevhen Yashchyshyn, DSc, Professor at Warsaw University of Technology, deputy Director for Research of Institute of Radioelectronics and Multimedia Technology;
3. Academic member: Dr. Olev Märten, Senior Research Fellow at Tallinn University of Technology;
4. Social partner representative: Šarūnas Venslavas, "Trina Solar (Schweiz) AG" Utilities Manager for the Baltics;
5. Student representative: Gabija Šliužaitė, Vilnius Gediminas Technical University, 3rd year student of the first-cycle study program "Industrial and Product Design", member of the Lithuanian Students' Union.

1.3. SITE VISIT

The site visit was organised on 23 April, 2025 onsite.

Meetings with the following members of the staff and stakeholders took place during the site visit:

- Senior management and administrative staff of the faculty(ies);
- Team responsible for preparation of the SER;
- Teaching staff;
- Students;
- Alumni and social stakeholders including employers.

There was no need for translation and the meetings were conducted in English.

1.4. BACKGROUND OF THE REVIEW

Overview of the HEI

State higher education institution Kaunas University of Technology began on 16 February 1922. Kaunas University of Technology was founded in Kaunas on February 16th, 2007. The Lithuanian scientific thought fostered here continued in later periods - from 1950 to 1990, Kaunas Polytechnic Institute (KPI), the first independent technical higher education institution in Lithuania, was famous for its ultrasound and vibrotechnic laboratories, textile research. After 1990, after regaining the status of a university, KTU embarked on a rapid path of study and scientific reforms. The University continues to strive for a harmonious partnership between science, business and industry, creating and implementing new ideas, innovations and inventions.

The University has 9 faculties, 8 institutes, 9 research centres, 23 student organisations, 12 dormitories, 7 art collectives, offers training in 20 sports, and the KTU publishing house "Technologija". KTU is the founder of 2 integrated science, study and business centres - valleys "Santaka" and "Nemunas". The protection and commercialisation of the University's scientific production is carried out by the KTU National Innovation and Business Centre. The Artificial Intelligence Competence Centre is responsible for the formulation of the KTU policy on the development of artificial intelligence and the coordination of activities related to artificial intelligence

Overview of the study field

KTU is known worldwide for its achievements in chemical technology, electronics, mechanics, computer engineering, health technology, materials science, environmental engineering, economics and management, civil society and many other fields. The University successfully implements projects of European and national research and innovation funding programmes and closely cooperates with partners in Lithuania and abroad. KTU provides its graduates with real opportunities to acquire a wide range of competencies for their future activities and reach career heights. A significant number of Lithuanian business leaders and managers are KTU graduates. Research-based study programmes of KTU are developed in cooperation with all stakeholders: teachers, researchers, students and business partners. KTU offers studies in 42 study fields in groups of study fields of mathematics, informatics, physical sciences, engineering, technology, health, social sciences, education, humanities, arts and business and public management. The University provides first, second and third cycle study programmes. In the academic year 2023-2024, 99 study programmes are open for admission, including 42 bachelor's programmes, 55 master's programmes, 1 study programme of integrated studies, 1 professional study programme in pedagogy, 50 of which are provided in the English language.

Previous external evaluations

Previous external evaluations of study programs conducted by Experts have been summarized in recommendations regarding the assessed area. KTU carried out actions that concerned:

I-cycle study programmes: During the previous evaluation study programme Automation and Control implemented 4 specializations. Currently 3 specializations are implemented. Instead of 11 3 ECTS credit subjects, currently 6 subjects are implemented. The teamwork encouraging module Product Development Product was included. The aims and learning outcomes of the study programme Transport Electronics have been reformulated, and the proposed study content has been adjusted accordingly. The study programme was supplemented with the modules: Microprocessors, Product Development Project, Artificial Intelligence in Transport Systems.The mentioned module was

deleted as the study programme concentrates to ground transport, cars more. The study programme Robotics is cancelled due to little interest from graduates.

II-cycle study programmes: The number of outcomes is corrected due to 3 groups of module alternatives implemented in the study programme. Social partners are active in forming the outcomes and other activities for Control Technologies. They are included into the structure of the Study Programme Committee, propose topics for final projects, participate in the final project defence commission, and hold lectures. The number and content of optional subjects were reviewed and reduced to 3 in every semester. In the II-cycle study programme Control Technologies new group of module alternatives was created Modules of Robot Control and it is continuation of mentioned I-cycle study programme.

Documents and information used in the review

The following documents and information have been provided by the HEI before the site visit:

- *Self-evaluation report and its annexes*
- *Final theses*

II. STUDY PROGRAMMES IN THE FIELD

First cycle/LTQF 6

Title of the study programme	**Automation and Control**	**Electronics Engineering**
State code	6121EX011	6121EX012
Type of study (college/university)	University	University
Mode of study (full time/part time) and nominal duration (in years)	Full-time, 4 years	Full-time, 4 years; Part-time, 6 years
Workload in ECTS	240	240
Award (degree and/or professional qualification)	Bachelor of Engineering Sciences	Bachelor of Engineering Sciences
Language of instruction	Lithuanian / English	Lithuanian
Admission requirements	Secondary Education	Secondary Education
First registration date	19 05 1997	19 05 1997
Comments (including remarks on joint or interdisciplinary nature of the programme, mode of provision)	-	-

First cycle/LTQF 6

Title of the study programme	**Electronics and Electrical Engineering**	**Intelligent Robotics Systems**
State code	6123EX002	6121EX013
Type of study (college/university)	University	University
Mode of study (full time/part time) and nominal duration (in years)	Full-time, 3 years	Full-time, 4 years
Workload in ECTS	180	240
Award (degree and/or professional qualification)	Bachelor of Engineering Sciences	Bachelor of Engineering Sciences
Language of instruction	English	Lithuanian / English
Admission requirements	Secondary Education	Secondary Education
First registration date	29 10 2019	10 03 2011
Comments (including remarks on joint or interdisciplinary	Interdisciplinary study programme	Double degree study programme, with Technical

		University of Cartagena (Universidad Politécnica de Cartagena), Spain)
nature of the programme, mode of provision)		

First cycle/LTQF 6

Title of the study programme	**Programmable Automation Systems**	**Transport Electronics**
State code	6121EX085	6121EX014
Type of study (college/university)	University	University
Mode of study (full time/part time) and nominal duration (in years)	Full-time, 4 years; Part-time, 6 years	Full-time, 4 years; Part-time, 6 years
Workload in ECTS	240	240
Award (degree and/or professional qualification)	Bachelor of Engineering Sciences	Bachelor of Engineering Sciences
Language of instruction	Lithuanian	Lithuanian / English
Admission requirements	Secondary Education	Secondary Education
First registration date	01 10 2019	02 03 2012
Comments (including remarks on joint or interdisciplinary nature of the programme, mode of provision)	-	-

Second cycle/LTQF 7

Title of the study programme	**Electronics Engineering**	**Control Technologies**
State code	6211EX012	6211EX014
Type of study (college/university)	University	University
Mode of study (full time/part time) and nominal duration (in years)	Full-time, 2 years	Full-time, 2 years
Workload in ECTS	120	120
Award (degree and/or professional qualification)	Master of Engineering Sciences	Master of Engineering Sciences
Language of instruction	Lithuanian / English	Lithuanian / English
Admission requirements	Bachelor degree in Engineering, Technology, Mathematics, Informatics or Physical sciences study field	Bachelor degree in Engineering, Technology, Mathematics, Informatics or Physical sciences study field

First registration date	19-02-2007	19-02-2007
Comments (including remarks on joint or interdisciplinary nature of the programme, mode of provision)		

III. ASSESSMENT IN POINTS BY CYCLE AND EVALUATION AREAS

The **first cycle** of the Electronics Engineering field of study is given a **positive** evaluation.

No.	Evaluation Area	Evaluation points[1*]
1.	Study aims, learning outcomes and curriculum	4
2.	Links between scientific (or artistic) research and higher education	4
3.	Student admission and support	4
4.	Teaching and learning, student assessment, and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Quality assurance and public information	4
	Total:	28

The **second cycle** of the Electronics Engineering field of study is given a **positive** evaluation.

No.	Evaluation Area	Evaluation points
1.	Study aims, learning outcomes and curriculum	4
2.	Links between scientific (or artistic) research and higher education	4
3.	Student admission and support	4
4.	Teaching and learning, student assessment, and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Quality assurance and public information	4
	Total:	28

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[1] **1 (unsatisfactory)** - the area does not meet the minimum requirements, there are substantial shortcomings that hinder the implementation of the programmes in the field.
2 (satisfactory) - the area meets the minimum requirements, but there are substantial shortcomings that need to be eliminated.
3 (good) - the area is being developed systematically, without any substantial shortcomings.
4 (very good) - the area is evaluated very well in the national context and internationally, without any shortcomings.
5 (exceptional) - the area is evaluated exceptionally well in the national context and internationally.

IV. STUDY FIELD ANALYSIS

AREA 1: STUDY AIMS, LEARNING OUTCOMES AND CURRICULUM

1.1.	Programmes are aligned with the country's economic and societal needs and the strategy of the HEI

FACTUAL SITUATION

1.1.1. Programme aims and learning outcomes are aligned with the needs of the society and/or the labour market.

The programme aims are clearly defined in self-assessment report and were confirmed at the site visit. Access to the programme aims and key learning outcomes is through the KTU website. The information is accessible to the public., e.g. at https://admissions.ktu.edu/wp-content//uploads/sites/299/2024/03/Study-catalogue-2024-2025.pdf.

The objectives of study programmes in the field of Electronics Engineering of KTU are focused on meeting the future needs of the labour market and are based on long-term EU and national strategies. The changes in the labour market in the context of globalization, the digitalization of industry and the emergence of artificial intelligence, highlighting the transformation of the set of knowledge and skills relevant to the labour market, are based in an Organisation for Economic Co-operation and Development (hereinafter OECD) report. Preparation of higher education specialists in electronics engineering (EE) has crucial importance for the Lithuanian new industry. An international orientation of the syllabus is mandatory in order to satisfy the future requirements of specialists in the field of EE.

The study programme is based on a clear modular description of the learning contents. Studies of the Electronics Engineering study field are implemented by the Faculty of Electrical and Electronics Engineering (FEEE) and the Panevėžys Faculty of Technology and Business (PFTB). FEEE is the section of the university that meets international standards of science and studies, is competitive in the international space in its field of science and studies, innovative, open to business and society, active in the implementation of the university's mission, strategic activities and goals. PFTB is a leading competence centre in North-Eastern Lithuania, conducting interdisciplinary high-level university studies and generating intellectual solutions for business and science. The programme aims and learning outcomes are University studies of first and second cycle leading to a *Bachelor* of *Electronics Engineering and Master of Electronics Engineering,* respectively. There are 8 study programmes in the field of Electronics Engineering at Kaunas University of Technology. Faculty of Electrical and Electronics Engineering organises I-cycle programmes: Automation and Control, Electronics Engineering, Electronics and Electrical Engineering, Intelligent Robotics Systems (double degree), Transport Electronics and two II-cycle programmes: Electronics Engineering and Control Technologies. Panevėžys Faculty of Technologies and Business implements the I-cycle programme Programmable Automation Systems (admission to this study programme is stopped from 2024-2025) and II-cycle programme Control Technologies.

KTU has no plans to establish new study programmes in the field of Electronics Engineering in a short time perspective. It is expected that the continuous development of study programmes will ensure their greater competitiveness and an even better matching of the competencies of the graduates of these programmes to the needs of the labour market. In the near future main priorities for the development of Electronics Engineering field remain: strengthening of innovativeness – new study methods are applied, study infrastructure is developed, while monitoring trends in the field's development and based on the latest researches in the field; entrepreneurship development – the aim is to develop graduates' competencies by including industry representatives into the study process, those competences are needed not only to meet the industry needs of today's but also tomorrow's; development of internationality in order to involve as many teachers and students as possible into international cooperation activities (internships, practice, scientific work and studies).

Learning outcomes are reflected by specific related modules and subjects each semester. The program meets the requirements of the EE market in Lithuania and abroad. Most courses are in English.

1.1.2. Programme aims and learning outcomes are aligned with the HEI's mission, goals, and strategy

The aims of the study programmes of the field and learning outcomes are in line with the mission, goals and strategic objectives of HEI as they are aimed at developing engineering competencies and training electronic engineering specialists for the global market. KTU FEEE mission – to develop competences of one's own field and transform them into added value for students, society and business. KTU FEEE aims to develop talents and personalities that are capable of solving present and future problems in the field of electronics engineering. For this reason, a very important component of KTU FEEE studies and research is cooperation with high-level scientific and academic institutions, industry, business and public sector. Hereby, the main focus is for the impact to industry and society through quality studies and research. The ongoing study programmes are based on a solid scientific basis, ensuring constant cooperation with the research groups of FEEE and PFTB. The last review of the portfolio and aims of the study programmes in the field of EE, in order to achieve harmony with the mission and strategic aims of the faculty was carried out in 2020, during the preparation of the report of Study Programmes Optimization Project. At this stage, the strategic priorities of KTU FEEE and KTU PFTB were specified and agreed upon, as well as how the ongoing programmes will contribute to them. In 2022, the results and content of study programmes were reviewed and adjusted to achieve harmony with the mission of the university and faculties.

If we look at KTU PFTB mission – to carry out high-quality university studies and to create scientific knowledge based on the cohesion of technologies and business, promoting the harmonious development of business and industry in the region of North-Eastern Lithuania we could say that KTU PFTB's attention is more focused on business than KTU FEEE, which develops research more. It is the reason why social partners point out that I-cycle graduates of KTU FEEE have no knowledge in planning and managing projects.

ANALYSIS AND CONCLUSION (regarding 1.1.)

Factual situation is fully met. Programme aims are definitely aligned with the needs of the labour market and society as the programme prepares analytically minded specialists who are able to install and operate electronic devices, telecommunications networks. The specialists who finish this programme are able to build automation systems, automated production and robotic systems. At the moment, there is a lack of these specialists in the market. Graduates of Electronics are able to work as specialists, engineers and managers in various types of business, industrial or public sector organizations.

1.2.	Programmes comply with legal requirements, while curriculum design, curriculum, teaching/learning and assessment methods enable students to achieve study aims and learning outcomes

FACTUAL SITUATION

1.2.1. Programmes comply with legal requirements

The scope of study programmes and individual subjects, and the forms of assessment fully comply with the requirements of the legal acts of the Republic of Lithuania and other legal documents regulating studies. All study programmes in the field of EE comply with the Descriptor of the study fields of Engineering, approved by the order of September 10, 2015, of the Minister of Education, Science and Sport of the Republic of Lithuania No. V-964, requirements for coverage, general and special study outcomes, teaching, studying, evaluation, and implementation of study programmes. The updated Descriptor of the Study Fields of Engineering will be applied for programmes of EE from 2024-2025 study year. The study programmes of the I and II cycles in the field of EE have been prepared and updated in accordance with the Description of the Lithuanian

Qualifications Framework, the Descriptor of Study Cycles, the General Requirements for the Provision of Studies, and the Descriptor of the Study Fields of Engineering on the basis of which the number of study credits for each target part of the study programmes has been selected so that students can successfully achieve the expected study outcomes.

The I-cycle study programme Automation and Control is conducted in the form of full-time studies, the duration of which is 4 years, and the volume is 240 ECTS credits of student contact and independent work hours. The volume of a student's individual study plan per semester is 30 ECTS credits.

The I-cycle study programme Electronics Engineering is conducted in the forms of full-time and part-time studies, the duration of which is 4 and 6 years, and the volume is 240 ECTS credits of student contact and independent work hours. The volume of a student's individual study plan per semester is 30 ECTS credits.

The I-cycle study programme Electronics and Electrical Engineering is conducted in the form of full-time studies, the duration of which is 3 years, and the volume is 180 ECTS credits of student contact and independent work hours. The volume of a student's individual study plan per semester is 30 ECTS credits.

The I-cycle study programme Intelligent Robotics Systems is conducted in the form of full-time studies, the duration of which is 4 years, and the volume is 240 ECTS credits of student contact and independent work hours. The volume of a student's individual study plan per semester is 30 ECTS credits.

The I-cycle study programme Transport Electronics is conducted in the forms of full-time and part-time studies, the duration of which is 4 and 6 years, and the volume is 240 ECTS credits of student contact and independent work hours. The volume of a student's individual study plan per semester is 30 ECTS credits.

The II-cycle study programme Electronics Engineering is conducted in the form of full-time studies, the duration of which is 2 years, and the volume is 120 ECTS credits of student contact and independent work hours. The volume of a student's individual study plan per semester is 30 ECTS credits.

1.2.2. Programme aims, learning outcomes, teaching/learning and assessment methods are aligned

The aims and learning outcomes of the programmes are aligned with the learning outcomes of the subjects as well as teaching and assessment methods in accordance with the principles of constructive alignment. In the introductory lecture, students are introduced to the outcomes they are expected to achieve, the teaching and assessment methods that will be used and the assessment criteria. The aims of the study programmes in the field of EE are linked to the learning outcomes, on the basis of which the objectives of the subjects (modules) of the I and II cycle study programmes are formed. Taking into account the assessment methods of the study modules, the evaluation criteria of the study modules are selected, the level of which must be compatible with the ten-point evaluation system. Each subject (module) of the programme is described according to the Methodological Instructions for Preparation of Study Module Programme (SMP) approved by KTU. The module description indicates the volume of the module in the number of credits, contact hours, and individual work hours, detailing the number of hours depending on the form of study; the assessment schedule and volume in academic hours of individual work; basic and additional study literature; relationships between learning outcomes, teaching/learning methods and assessment methods; evaluation criteria for each assessment form; the coordinating teacher of the module. All KTU modules are systematically reviewed and improved in accordance with KTU Study Module Certification Regulations. Study programmes are structured in such a way as to encourage each student to study and to demonstrate the level of achievement of learning outcomes.

Various assessment forms are used to assess the achievement of module learning outcomes, among which the most common forms are: exam, mid-term exam, report/project report, oral illustrated report, solution of problematic tasks, portfolio of work or competence, individual work. Other assessment methods used are performance reflection, peer evaluation. Methods such as essays, idea (thought) mapping, scientific article analysis, etc., are also used to achieve the specific objectives of the modules and to evaluate progress.

Various assessment methods are used to evaluate the study achievements. Taking into account the assessment methods of the study modules, the evaluation criteria of the study modules are

selected, the level of which must be compatible with the ten-point evaluation system. Having a set of linked study and assessment methods makes it easier for teachers to decide: a) which methods are the most appropriate for the taught subject; b) whether the tasks of several subjects can be integrated into a common work and how they should be assessed. Does this ensure that the assessment is reasonable, and reliable and allows for proper measurement of the achieved study results the teaching/learning method used to achieve the learning outcomes? In this situation, a lot depends on teachers.

1.2.3. Curriculum ensures consistent development of student competences

Study subjects are arranged in such a way that their content fulfills the learning outcomes and subsequent study subjects are based on the learning outcomes achieved in previously taught subjects. Study subjects are grouped into four sections: general subjects of higher education college studies, study field subjects, subjects intended for deeper specialisation in the field, and optional subjects.

The structure and content of the study programmes in the field of EE are designed taking into account the aims and desired learning outcomes of the programmes and the Requirements of the Structure of KTU Study Programmes. In the programmes, the modules are selected in such a way that their content and topics do not overlap, except when the general topics of a particular module are later deepened in specialized modules, supplementing the general understanding with deeper specialized knowledge and skills.

The general university study subjects in the I-cycle programmes in the field of Electronics Engineering include 12 ECTS credits. The subjects of fundamentals of engineering in the field study programme Electronics Engineering include 18 ECTS credits. The subjects of fundamentals of engineering in the field study programme Intelligent Robotics Systems include 36 ECTS credits. The subjects of mathematics and physical science in study programmes of the field include 30 credits. The subjects of study in study programme Electronics Engineering include 144 ECTS credits. The subjects of study in the study programme Intelligent Robotics Systems include 99 ECTS credits. In the I-cycle study programme students learn subjects of social sciences that include 9 credits.The deepening (specialization) subjects in the study programme Electronics Engineering include 24 ECTS credits.The deepening (specialization) subjects in the study programme Intelligent Robotics Systems include 36 ECTS credits. The subjects of the alternative group in study programme Electronics Engineering include 12 ECTS credits. The subjects of alternative group in study programme Intelligent Robotics Systems include 12 ECTS credits. In all I-cycle study programmes, the possibility to take optional subjects (6 ECTS) is ensured. Internship includes 15 ECTS credits in study programmes and is intended for the acquisition and strengthening of students' practical skills. Students consolidate the knowledge and abilities acquired during their studies by preparing a Bachelor's degree final project (15 ECTS credits).The structure of the double degree bachelor's study programme is coordinated by a separate agreement.

Structure of the I-cycle study programme Automation and Control in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 40(240) and per semester are: 1- 6(30); 2 - 6(30); 3 - 5(30); 4 - 5(30); 5- 5(30); 6 - 5(30); 7 - 6(30); 8 - 2(30).

Structure of the I-cycle study programme Electronics Engineering in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 37(240) and per semester are: 1- 5(30); 2 - 5(30); 3 - 5(30); 4 - 5(30); 5- 5(30); 6 - 5(30); 7 - 7(30); 8 - 2(30).

With the expansion and establishment of electronic equipment manufacturing companies of foreign capital in Lithuania, where the need for qualified workers is very high, it was decided to establish an interdisciplinary study programme Electronics and Electrical Engineering in the field of Electronics Engineering taught in English only. The programme was created according to University's model 3+2, when the volume of the I-cycle programme is 180 ECTS credits, duration – 3 years. Graduates of this programme can study in II-cycle studies. Structure of the I-cycle study programme Electronics and Electrical Engineering in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 28(180) and per semester are: 1- 5(30); 2 - 5(30); 3 - 5(30); 4 - 5(30); 5- 5(30)/2(30); 6 - 28(180)/5(30).

Structure of the I-cycle study programme Intelligent Robotics Systems in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 40(240) and per semester are: 1- 6(30); 2 - 6(30); 3 - 5(30); 4 - 5(30); 5- 5(30); 6 - 5(30); 7 - 6(30); 8 - 2(30).

Structure of the I-cycle study programme Transport Electronics in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 37(240) and per semester are: 1- 5(30); 2 - 5(30); 3 - 5(30); 4 - 5(30); 5- 5(30); 6 - 5(30); 7 - 7(30); 8 - 2(30).

The study field in the II-cycle programmes include no less than 60 ECTS credits. Deep knowledge of electronics engineering and skills are developed through 15 or 13 study field modules respectively. University-defined or student-elective modules (Competence Alternatives). In the study programmes in the field of Electronics Engineering students can choose 18 ECTS credits of field's competence alternatives and have the opportunity to choose one of two paths: 1) Competence of Expert – in this case, the student chooses deepening study modules, developing knowledge and abilities in the field of study; or 2) Competence of MA+, which allows developing interdisciplinary competences by studying modules of other study fields. Any path (competence) covers 3 modules. The Master's Degree Final Project in all II-cycle study programmes consists of 30 ECTS credits.

Structure of the II-cycle study programme Electronics Engineering in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 16(120) and per semester are: 1- 5(30); 2 - 5(30); 3 - 5(30); 4 - 1(30).

Structure of the II-cycle study programme Control Technologies in terms of subjects and ECTS credits looks as follows: Total number of subjects and credits in the programme 17(120) and per semester are: 1- 5(30); 2 - 5(30); 3 - 6(30); 4 - 1(30).

1.2.4. Opportunities for students to personalise curriculum according to their personal learning goals and intended learning outcomes are ensured

Studies can be personalised by choosing a full-time or part-time studies, choosing elective and selective subjects and the desired specialisation. Students who have passed all previously taught subjects can choose to study according to a personalised schedule.

The students of KTU bachelor's studies can personalise their studies by choosing the following: Bridging courses; General university study modules; Alternatives of the study programme; Topics of the semester's works and projects and the final degree project; Additional study module in the volume of up to 6 credits; Additional internship during the time off or in summer.

The students of II-cycle study programme EE can personalise their studies by choosing the following: Alternatives of study programme (MA+ competencies); Alternatives of the field's study modules; Topics of the semester's works and projects and the final degree project; Internship during the time off or in summer.

University students are invited to actively participate in the ECIU University activities by additionally selecting modules offered by thirteen European universities and addressing challenges submitted by enterprises and organisations (on the topic of Sustainable Development Goals) with an international and interdisciplinary team of students and mentor teachers.

1.2.5. Final theses (applied projects) comply with the requirements for the field and cycle

The preparation and defence of final degree projects are regulated by KTU Guidelines for the Preparation and Defence of Final Degree Projects and the Methodological Requirements for the preparation and Defence of Final Degree Project of the FEEE.

The topics of bachelor's final projects are offered by companies where students do their internship; those topics are related to the tasks of an internship. In bachelor's final degree projects problems relevant to the industry are solved: creation of innovative industrial systems, tasks of updating and optimizing existing technological lines, tasks of using intelligent systems in industry, integration of image processing systems into industry, etc.

It is very pleasing that the University's social partners provide students with access to the infrastructure created in factories or offices, so that students can carry out their research work as accurately as possible. The social partners also pay particular attention to the themes of the final

theses and assign responsible tutors from their companies to help students with the integration of practical and theoretical information into the whole process.

The topics of master's degree projects are related to the works of experimental development and research carried out by FEEE and PFTB scientific groups: application of advanced modelling, optimisation and control methods and computational intelligence algorithms in biotechnological processes; solved problems related to the monitoring and control of parameters of the industrial environment using electronic systems, automated energy-efficient data transmission, both in the field of the smart city as well as in industry or medicine; embedded systems research is implemented; research is dedicated to creating a human-assisted robotic system capable of autonomously sensing 3D space and recognizing human gestures (commands) using stereovision and digital intelligence algorithms; digital control and robotization of production processes etc.

All master's degree students are working. From this perspective Social partners are so active in offering topics for master final projects. The topics of bachelor's and master's final projects are related to the tasks of the fourth industrial revolution and digital transformation.Businesses are well aware that if they engage and involve students in active learning activities, they will be able to reap significant innovation benefits for their companies from these future professionals. As a result, the social partners try to provide as many challenges and opportunities as possible for students with themes for their final theses.

ANALYSIS AND CONCLUSION (regarding 1.2.)

The factual situation is fully met. All study programmes in the field of Electronics Engineering comply with the Descriptor of the study fields of Engineering, approved by the order of September 10, 2015, of the Minister of Education, Science and Sport of the Republic of Lithuania No. V-964, requirements for coverage, general and special study outcomes, teaching, studying, evaluation, and implementation of study programmes. The study programs realistically reflect the requirements and recommendations as well as the expectations of the industrial environment. KTU ensures constructive harmony between the objectives, outcomes, and study modules and the methods (innovative and interactive) used in them are based on the training and didactic workshops organised by KTU EDU_Lab. KTU continuously monitors the compliance of study programs with the changing requirements and needs of the labour market.

However, the methods for assessing the achievement of outcomes are not uniform and do not allow for a qualitative and reliable assessment. Having a set of linked study and different assessment methods allows for teachers to decide: a) which methods are the most appropriate for the taught subject; b) whether the tasks of several subjects can be integrated into a common work and how they should be assessed. The assessment should be rational and reliable and allow for the correct measurement of the achieved test results, the teaching method used to achieve the learning outcomes. In this situation, a lot depends on teachers. Moreover, social partners point out that I-cycle graduates of KTU FEEE have no sufficient knowledge in planning and managing projects and low social skills in teamwork in I-cycle studies.

AREA 1: CONCLUSIONS

AREA 1	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Continuous monitoring the compliance of study programs with the changing requirements and needs of the labour market;
2. The study programs realistically reflect the requirements and recommendations as well as the expectations of the industrial environment;
3. Ensuring constructive harmony between the objectives, outcomes, and study modules and the methods (innovative and interactive) used in them are based on the training and didactic workshops organised by KTU EDU_Lab.

RECOMMENDATIONS

For further improvement

1. Consideration of standardization of methods for evaluating results;
2. Considering the introduction of the topic of project management in I-cycle studies;
3. Considering the introduction of the topic of social skills in teamwork in I-cycle studies.

AREA 2: LINKS BETWEEN SCIENTIFIC (OR ARTISTIC) RESEARCH AND
HIGHER EDUCATION

2.1.	Higher education integrates the latest developments in scientific (or artistic) research and technology and enables students to develop skills for scientific (or artistic) research

FACTUAL SITUATION

2.1.1. Research within the field of study is at a sufficient level

The research development strategy of the Electrical and Electronics Engineering studies field is reflected in the updated and approved R&D&I strategies of FEEE and PFTB (FEEE 06/12/2022 Council meeting protocol No. V10 TF-03-05; PFTB 25/02/2021 Council meeting protocol No. V10-TF-13-1), as well as in the joint evaluation unit (VU) Electrical and Electronics Engineering strategic activity plan, which combines the R&D&I strategies of all KTU departments participating in the VU and specifies the concrete science and innovation indicators expected to be achieved for the years 2023-2025. Following the description approved by the Minister of Education, Science and Sports of the Republic of Lithuania, the conclusions of the comparative expert evaluation of research and experimental development (R&D) organized by the Research Council by Lithuanian, state that KTU researches implemented in the field of Electrical and Electronics Engineering in 2018–2022 are high level and recognized internationally (weighted estimate of the quality of R&D activities – 4, in a scale from 1 (unsatisfactory) to 5 (excellent)).

KTU FEEE and PFTB research activity plans in the science field of Electrical and Electronics Engineering is the result of an annual planning process involving the KTU Science Department, deans of faculties, vice-deans for science, leaders of research groups and all researchers. To achieve planned indicators, the internal sources of funds (funds of the Scientific Funds of Research Groups), allocated for the implementation of research activities of FEEE and PFTB, are used. This is also associated with institutional financing opportunities provided by: KTU Fund for International Scientific Events, focusing to the dissemination of research results of doctoral students (in exceptional cases, master's students) abroad and joining the international scientific community; ECIU Researchers Mobility Fund, aiming to bring together researchers from ECIU universities, raising the competence of international researches; KTU Doctoral Fund, that sponsors the studies of the University's doctoral students, preparation of scientific articles and dissertations, creative research activities.

External financing of research activities mostly includes measures of the Research Council of Lithuania (LMT). These sources of funding are particularly related to the strengthening of the competence of researchers and the dissemination of scientific results, as they provide opportunities for active researchers to improve their competence in scientific events and scientific internships abroad. On average, during the year, each active partner of the University got involved in 3 activities or initiatives, such as participation in the events, giving lectures, allocation of internship places to students, participation in the mentorship programme, etc. The support collected for the scholarships from the sponsors of the University reached 141 936 euros in 2023 and 75 000 euros were raised for infrastructure improvements.

The University has a very active partnership with the social partners in the Region, who invest heavily in the University's laboratories and students. During the meeting with the Social Partners, the opinion was expressed that the competence of the University's lecturers is very important to them and that they could also contribute financially to encourage the University's lecturers' research work, the writing of articles on certain topics, and the participation in scientific conferences.

The university community must continue to be open and inclusive with the region's social partners. There are many multinational companies in the region that are very supportive of the University, and the University community should increase internationalisation and encourage as many students as possible to go on Erasmus or other programmes to study, research, and undertake internships in foreign countries, thus promoting greater international inclusion.

2.1.2. Curriculum is linked to the latest developments in science, art, and technology

The integration of the latest scientific knowledge and technological innovations into the ongoing study programmes is enabled by the high scientific and didactic competence of the teachers, which is constantly strengthened by participating in international scientific events (e.g. 2020 IEEE International Conference on Multisensor Fusion and Integration, 17th IEEE International Conference on the European Energy Market, 11th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications, 2021 IEEE PES/IAS PowerAfrica Conference, 14th International Joint Conference on Biomedical Engineering Systems and Technologies, 29th Mediterranean Conference on Control and Automation, International Conference on Electrical, Computer and Energy Technologies, 2021, Computing Conference 2021, 2022 IEEE International Ultrasonics Symposium etc.) and internships (e.g. programme for students NASA, TGW Logistics Group (Great Britain), Fermette Food Group NV (Belgium), INGENIARIUS Lda (Portugal), Impex Innovation General Trading LLC (United Arab Emirates) that gather professionals in the area. However, In 2023, only 16 students participated in scientific conferences.

The level of the latest scientific knowledge and research results is determined by the cycle of study, therefore their integration is primarily reflected in the content of the II-cycle study programs EE. The research results into the content of the ongoing study programs is reflected in the topics submitted to the final project topic competition, which are implemented during the study modules Research Project and Master's Degree Final Project. One of the proofs of the continuous strengthening of the scientific competence of teachers is the high activity in result publishing of research at conferences. Often participation in internationally recognized conferences is sponsored from the funds of ongoing external projects. It should be noted that the teachers of the programs are regular participants of international conferences. It is worth mentioning that the teachers of the programme are members of the editorial boards or chief editors of international scientific journals.

The programme has the ability to monitor and analyse the latest academic publications. There is direct access to EBSCO and EMERALD databases, and other electronic resources from big universities such as Vilnius University of Technology. Students have the opportunity to practice with the latest technologies in electronics.

2.1.3. Opportunities for students to engage in research are consistent with the cycle

Students have an opportunity to present their practically realized results of scientific activities to the public, potential partners and investors at the annual international exhibition of student's scientific works organized by KTU and to present the results of their research at the annual student scientific conference *Technology and Business Current Affairs* organized by PFTB. In 2020, 19 students were involved into research projects implemented by the teachers of the study programme, 5 students participated in R&D orders. In 2021 accordingly – 16 and 7, in 2022 – 19 and 5. By participating in the implementation of the project, students have the opportunity to prepare a final degree project of a high scientific level, which motivates them to continue their research activities and increases the competitive conditions for admission to doctoral studies.

Acquaintance of the students of the I-cycle study programmes with the scientific achievements of Electrical and Electronics Engineering is ensured in the first semester by studying the modules, for example Introduction to Speciality, which devotes to presenting the latest scientific research in the field of electronics.

The level of the latest scientific knowledge and research results is determined by the cycle of study, therefore their integration is primarily reflected in the content of the II-cycle study programs Electronics Engineering and Control Technologies. One of the most significant ways to link study

content with the latest scientific and technological achievements is the use of data collected on the basis of project activities for the preparation of master's degree final projects.

The involvement of students in writing scientific articles and participation in scientific conferences provides the prerequisites for connecting the content of studies with the latest scientific and technological achievements. In the study field of Electronics Engineering, students are systematically encouraged to present their research and contribute to the writing of scientific articles. Preparation of articles requires knowledge of the Knowledge Frontier and modern scientific methods. Participation in conferences not only develops presentation skills, but also allows one to get acquainted with other relevant research. In 2020–2022 students of the field of Electronics Engineering have prepared more than 25 articles in indexed publications Web of Science database with a citation index, more than 51 in material of conference presentation and presented 51 research in conferences

By participating in the implementation of the project, students have the opportunity to prepare a final degree project of a high scientific level, which motivates them to continue their research activities and increases the competitive conditions for admission to doctoral studies. Doctoral students of Electrical and Electronics science field, as well as students of the EE study program, have the opportunity to actively contribute to the fundamental and applied scientific research implemented at the faculty, and also participate in R&D works with national and international companies, national and international projects. KTU FEEE and PFTB researchers have implemented 14 national level science-business projects in both fields of sciences Electrical and Electronics Engineering as well as Informatics Engineering in 2020–2022 in collaboration with companies such as: MB Dok Inovacija, UAB GRUPPO FOS LITHUANIA, UAB INVESTIGO, UAB LAVANGO GROUP, UAB Būsto automatika, MB Cumulati, UAB „Altas IT, UAB VEKOMPANI, MB INOAVIA, AB Lietuvos energijos gamyba, UAB FABRICAIR, UAB SIGNEDA, UAB Celltechna, UAB Industrial robotics company etc. Commissioned projects were implemented actively. Orders were received from national companies (UAB Nanoenergija, UAB Light Conversion, UAB Printera, UAB Nivela, UAB Bagfactory, UAB Daleksvita, UAB Inlusion Netforms, UAB Baltic Orthoservice, UAB Biotechpharma, UAB Teltonika Telemedic, UAB Richelie, UAB DTS Solutions, MB Ulsontech, AB Achema, AB Litgrid, UAB Ortho Baltic, UAB Litesko, UAB ORLEN Lietuva, UAB Šviesos gamyba, UAB Donlora, UAB Unidrive.Pro, UAB Axioma Metering, UAB Lokmita, MB Bito nuoma, UAB Civecosas etc.), as well as from international/foreign companies (Azeriri Private Limited (India), Neumann & CO Wasserzahler Glaubitz GMBH (Germany), MATRIX U/E TECHNOLOGIES LTD (China), X-Ray Imaging Solutions XRIS (France), SzeleSTIM Gmbh (Austria) etc.), which shows that the competencies of KTU FEEE and PFTB researchers are internationally recognized.The unique infrastructure, acquired by the line of investment projects, creates very favourable conditions for doctoral students to conduct high-level, including interdisciplinary research, prototype proposed solutions and implement them in companies mentioned above. Results of the scientific activities of research groups of FEEE can be summarized as follows: the increase in income of R&D&I works & services in 5 years by 69 %; the increase in income of research projects in 5 years by 20 %; the increase in number of scientific publications indexed in the Web of Science with Impact Factor Q1–Q2 in 5 years by 17 %.

ANALYSIS AND CONCLUSION (regarding 2.1.)

Factual situation is fully met. The vision of the KTU is to be a technological university competitive in the international arena, interdisciplinary, involved in the development and transfer of new knowledge and innovation. Increasing the internationalization of studies in the field of Electronics Engineering is noticeable. Analysing the number of foreign students of study programmes in the field of Electronics Engineering it can be said that the internationality of the

programmes is quite high, since the ratio of foreign students grew every year and in 2022 exceeded the 10 percent limit. This shows that the programs are visible outside the borders of the Republic of Lithuania, and the wide geography confirms its good evaluation among foreign students. 2020–2022 the number of foreign students was lower due to the pandemic situation.

During 2022-2025 dynamics of the publication of scientific articles shows that attention is gradually shifting to the publication of articles in Q1 quartile journals. In addition, the number of patent applications is increasing. Preliminary results of scientific activities for 2023 shows that the number of scientific publications compared to 2022 Q1 and Q2 quartiles in scientific journals increased by 37 percent (from 37 to 51).   33% of FTE is allocated to scientific and expert activities. According to the Statute, heads of academic departments are responsible for scientific activities in departments. At the beginning of the year, each employee submits workload plans, which include pedagogical, scientific and expert activities to the head of department for approval.

There are opportunities for students to engage in research, but the motivation is poor. In 2023, only 16 students participated in scientific conferences. This represents only 6% of the total student number. On average 10 papers per year are published.The main problem seems to be the fact that most students work outside KTU and cannot be engaged in scientific projects besides the research related to the preparation of Bachelor's and Master's theses. In 2020, 19 students were involved into research projects, 5 students participated in R&D orders. In 2021 accordingly – 16 and 7, in 2022 – 19 and 5. However, students are aware that they can be employed in high-quality positions after graduation because they have excellent opportunities to work in research laboratories, where they gain additional engineering qualifications and knowledge. Moreover, employers do not require potential graduates to confirm their skills through publications and to be present at conferences. In most cases, students who are involved in research have plans related to PhD studies.

AREA 2: CONCLUSIONS

AREA 2	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Students are aware that they can be employed in high-quality positions after graduation because they have excellent opportunities to work in research laboratories, where they gain additional engineering qualifications and knowledge;
2. The potential of EE studies, based on the latest scientific knowledge and research results, is based on the assessment of the quality and profitability of scientific activities carried out by KTU, FEEE and PTFB, which confirm the high level of competences of scientists in the field of Electrical and Electronics Engineering;
3. Increasing the internationalization of studies in the field of Electronics Engineering is based on a long-term international academic partnership, cooperation with companies and associations.

RECOMMENDATIONS

For further improvement

1. Consider increasing the competitiveness of wages for second-cycle students in relation to wages in the labor market by engaging them in research projects, including international ones;
2. Promoting a more active initiative in engaging students in research, especially second-cycle students.

AREA 3: STUDENT ADMISSION AND SUPPORT

3.1.	Student selection and admission is in line with the learning outcomes

FACTUAL SITUATION

3.1.1. Student selection and admission criteria and procedures are adequate and transparent

The admission to I-cycle study programmes of the field of EE is conducted by Kaunas University of Technology yearly, according to the Regulations for the Student Admission to Kaunas University of Technology approved by KTU Senate until 1 December published on the University's website. The centralised admission is conducted following the description of procedure for the formation of the competition queues of the applicants to the state-funded positions of the first cycle and integrated studies and applying for the scholarships for studies in the current academic year approved by the order of the Minister of Education, Science and Sport of the Republic of Lithuania. The centralised admission to the first cycle and integrated studies is organised and conducted, the competition queue of the graduates of secondary education is formed by the Lithuanian Association of Higher Education Schools Conducting Centralised Admission (hereinafter – LAMA BPO), following the authorisation granted by the Minister of Education, Science and Sport of the Republic of Lithuania in the current year. The competition score consists of the sum of the examination evaluations or annual grades of the subjects of the maturity certificate (supplement) converted into a ten-point evaluation scale under the procedure set out by the Minister of Education, Science and Sport of the Republic of Lithuania and/or the evaluations of the entrance examinations multiplied by their weighting coefficients. To the I-cycle study programmes are accepted students satisfying minimum requirements: Three state maturity exams must be passed; the arithmetic mean of the best annual marks for the five subjects in the maturity certificate supplement must be at least 7; the competitive score must be at least the score set for the current year by the Minister of Education, Science, and Sports of the Republic of Lithuania, i.e., 5.4 points.

The structure of the score upon admission to the I-cycle study programmes is defined in the Admission Rules and in the Conditions of Admission section of the study programme. Information for the competitive score is taken from the relevant educational documents (e.g. Regulations for the Student Admission to Kaunas University of Technology, Association of Lithuanian Higher Education Institutions for Centralised Admissions LAMA BPO. Access online: https://lamabpo.lt/en/study-in-lithuania/LAMA BPO and on the KTU website section Admissions and in KTU information publications of bachelor studies) and other documents or components. The competitive score is calculated according to the procedure approved by the Minister of Education, Science, and Sports of the Republic of Lithuania, using a ten-point scale.

According to the order of the Minister of Education, Science, and Sports of the Republic of Lithuania for the current year, additional points may be added to the competitive score for other achievements of the applicant: for the achievements in international and national Olympiads, competitions, and etc.; for a diploma of completion of the vocational training programme in the same field of education with honours; for completion of basic military training or permanent compulsory military service; for the obtained assessment ≥ 9 of the final maturity work of the first or second subject.

Admission to the II-cycle studies in the field of EE is carried out by the University in accordance with the rules for the admission of students to the Kaunas University of Technology, which are approved by the KTU Senate every year by December 1 and are published on the

University's website. KTU is conducting admission for the following II-cycle study programs in the field of Electronics Engineering:

- Electronics Engineering (LT/EN). Studies are conducted 2 years full-time, evening-time, blended learning, on campus. There is a possibility to choose MA+ competence;
- Control Technologies (LT/EN). Studies are conducted 2 years full-time/weekend, evening-time, blended learning, on-campus. (Studies at PFTB are implemented on weekends and evenings in Lithuanian language, studies at FEEE – in the evenings, in both Lithuanian and English languages). There is a possibility to choose MA+ competence.

The graduates of the first cycle and integrated studies who comply with the requirements specified in the description of the study fields (groups of study fields) and the descriptions of the study programmes of the second cycle studies are admitted to the second cycle studies.

3.1.2. Recognition of foreign qualifications, periods of study, and prior learning (established provisions and procedures)

Admission of foreign citizens applying for state non-funded study positions is carried out in the Dream Apply information system. The evaluation and academic recognition of foreign education are carried out by the University's International Relations Department. Kaunas University of Technology is entitled to conduct the academic recognition of the education and qualifications of the applicants to studies related to higher education and acquired under the educational programmes of foreign countries and international organisations by Order No. V-610 of the Minister of Education, Science and Sport of the Republic of Lithuania of 28 July 2017.

Admission of persons who have acquired secondary or equivalent education (qualification) in foreign institutions or under the education programmes of international organisations and who apply for state-funded study positions is centralised, conducted under the procedure set out in the Description of the Procedure for Competition for Admission to State-Funded Study Positions in Higher Education Institutions, approved by the Order of the Minister of Education, Science and Sport of the Republic of Lithuania.

The education documents issued at foreign institutions have to be acknowledged in the Republic of Lithuania under the relevant procedure. The evaluation and academic recognition of education acquired abroad is conducted by the International Relations Department of the University. Analysing the number of foreign students of study programmes in the field of Electronics Engineering it can be said that the internationality of the programmes is quite high, since the ratio of foreign students grew every year and in 2022 exceeded the 10 percent limit. In 2022–2023 study year 67 qualification recognition were made of those who applied for studies to programmes of Electronics Engineering study field, 37 were enrolled (54 percent). This shows that the programs are visible outside the borders of the Republic of Lithuania. Learning outcomes obtained in other Lithuanian or foreign higher education institutions may be credited following KTU Guidelines for the Recognition of Learning Outcomes. KTU FEEE and PFTB tend to recognise the learning outcomes of the course in two cases: 1) when a student has taken the course in a foreign higher education institution during their partial studies, and 2) when a student has taken the course in another higher education institution in Lithuania (the results of previous studies are taken into account after being admitted to a higher course, or which have been studied without prior coordination). The number of recognized modules from previously acquired learning outcomes in the I cycle is significantly higher than in the II cycle. In all cases, this is the recognition of repeated modules that students enrolled in the programme or in its higher course have taken during their previous studies. The increasing number of recognized modules of the I cycle shows that students increasingly use the opportunity to continue their studies in related fields and use the opportunity to recognize the already acquired competence. The assessment of the learning outcomes obtained via non-formal and informal learning and recognition of competencies is carried out following KTU Guidelines for the Evaluation of Academic

Achievements and Recognition of Competencies Acquired via Non-Formal and Informal Learning. Competencies acquired through non-formal and informal learning may be assessed and recognised as learning outcomes. During the analysed period, in 2020-2021 there was one case of non-formal recognition of learning outcomes in the I-cycle Electronics Engineering study programme of the Electronics Engineering field. The student took the English language C1 module exam test. The student was on Erasmus in the Vienna University of Technology in that semester in which his study plan at KTU includes the English language C1 module. His Erasmus semester was accepted for semester assignments and when returned, the student only took the exam.

ANALYSIS AND CONCLUSION (regarding 3.1.)

It can be seen (from SER and site visit) that the number of students admitted to study programme EE is basically determined by the choice of this study programme as the first priority.

In I-cycle studies, the average competitive score was similar in all programs. The competitive scores of the Electronics and Electrical Engineering study programme that is conducted only in English language are somewhat higher than in the rest study programmes.

The number of people admitted to state-funded places in II-cycle study programmes depends on their allocation policy at the University and faculty – the minimum number is limited by the requirement of profitability, the maximum number is limited by the number of places allocated according to the amount of funding. Study programmes of the field of EE are popular among applicants of the study programmes offered in FEEE. The number of those who want to study is stable every year, but not enough to meet the needs of the industry.

The number of foreign students of study programmes in the field of EE it can be said that the internationality of the programmes is quite high, since the ratio of foreign students grew every year and in 2022 exceeded 10 percent limit, and in 2023 more than 12%.

3.2.	There is an effective student support system enabling students to maximise their learning progress

FACTUAL SITUATION

3.2.1. Opportunities for student academic mobility are ensured

The students are provided with the opportunities to complete an international internship or partial studies abroad. Academic mobility can be: physical - students physically go abroad to study at a foreign higher education institution; mixed - combining physical mobility with virtual activities carried out remotely without leaving the host country and can be before, during or after physical mobility; and virtual mobility - using information and communication technologies without leaving the country of the host institution. The new "Erasmus+" programme that has begun in 2021 is supplemented by new forms of mobility, such as short-term mobility of doctoral students and blended intensive programmes.

The number of incoming students of EE field's for part-time studies and international internship programs conducted by KTU was significantly more than outgoing. During the site visit, it was noticed that despite the wide choice and opportunities, the main reason why students do not tend to choose part-time studies or internships abroad is employment in Lithuanian companies and the risk of losing their job. I-cycle students usually start working in the III-IV year, while II-cycle students are almost 100 percent working. Such a tendency is characteristic not only among students of the EE study field. In 2022-2023 s. y. 1 II-cycle and 16 I-cycle students of the field of Electronics Engineering went to blended intensive courses (intensive module) to Maia Institute of Higher Education (Portugal), IMC Krems University of Applied Sciences (Austria), Polytechnic Institute of Braganca (Portugal), Lodz University of Technology (Poland). The total number of incoming students

for part-time studies and internships in the field of electronic engineering from 2020 to 2023 is 83. The total number of outgoing students for part-time studies and internships in the field of electronic engineering from 2020 to 2023 is 25 in case of I-cycle studies and 5 for II-cycle.

The University has the brand "KTU DISCOVERed International Student Exchange" used for the publicity of various mobility opportunities for KTU students. Information about the mobility opportunities is also available on the website ktu.edu and in the newsletters of the University. KTU pays a lot of attention to informing and encouraging students to go on part-time studies abroad or to do an internship in a foreign company, both due to global challenges and other reasons, students' activity in this area is relatively low. It is stated in SER that the events as "Go Abroad Fair", "Discovered Info Point" and "Café Erasmus" are used for the presentation of the opportunities of studies and internships.

3.2.2. Academic, financial, social, psychological, and personal support provided to students is relevant, adequate, and effective

The KTU provides comprehensive academic, financial, social, personal, psychological support to the students. It provides complex academic support to students, for example: GUIDed Mentorship Programme, Talent Academy, GIFTed, GIFTed Masters, SKILLed FinTech and SKILLed AI programmes, including the bridging courses of general study modules, individual consultations by teachers, etc.

The KTU offers (from SER) the following opportunities of financial support: a) the University's talent scholarships are awarded; b) the nominal Patron's (Sponsor's) scholarships and the scholarships by enterprises are awarded; c) the one-off incentive scholarships can be awarded; d) one-off social scholarships may be awarded to students in a difficult financial situation (illness, illness or death of family members, etc.) and in the case of a bilateral exchange, mobility scholarships may be awarded. The students with disabilities can be granted the targeted payments for special needs, partial compensation of the costs of studies if they are admitted to the state non-funded studies, a social scholarship, and a reduced fee for accommodation in the dormitory.

The KTU encourages the social life of students and offers them to get involved in the activities of non-formal education programmes. Beside the above mentioned programme KTU provides additional one: WANTed, UNITed, INSPIRed and ACTIVATed. The KTU aims to provide comprehensive academic, emotional and psychological support to its students by appointing a peer mentor, the students are invited to choose an academic and career mentor, if needed – they can get consultations by tutors. The students can also apply to the University psychologists or a chaplain and his coordinated group of pastoral care.

3.2.3. Higher education information and student counselling are sufficient

The education information is provided to the students admitted to the study programme and the communication is conducted via email (according to SER). All requirements for students are available in the programme of the study module in the Academic Information System and "Moodle".

The Study Centres of FEEE and PFTB, the Department of Student Affairs and the Department of Academic Affairs provide consultations on the issues of the organisation of studies, tuition fees and support. The students' interests are represented by KTU Students' Association and the Students' Association of FEEE FSA ESA and PFTB Students Association.

ANALYSIS AND CONCLUSION (regarding 3.2.)

Factual situation is fully met. Information relevant to admission and studies is concentrated and available in publicly available digital sources, which allows communication of relevant information clearer and more appropriate for interested parties. Programmes of academic assistance, financial

and social support, psychological and personal assistance developed at the KTU provide opportunities for members of the academic community to actually receive comprehensive assistance. Students of the programs have the opportunity to fully use joint university resources and thus satisfy their study, financial, and partly – social needs. This allows them to adapt more quickly in the academic community, to overcome academic, financial and psychological difficulties more easily, and to motivate themselves to achieve better results in their studies and social activities

AREA 3: CONCLUSIONS

AREA 3	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Students have the opportunity to make full use of the university's common resources and thus enjoy learning, financial, and partly – social needs;
2. Programs of academic aid, financial and social support, psychological and personal assistance developed at the KTU creates an opportunity for members of the academic community to receive comprehensive assistance;
3. Information relevant to admission and studies is concentrated and available in publicly available digital sources, which allows the communication of relevant information clearer and more appropriate for interested parties.

RECOMMENDATIONS

For further improvement

1. Emphasising the advantages and benefits of partial experience more often study abroad for both study and work;
2. Increased attention to cooperation with international social partners, which can help enhance student mobility.

AREA 4: TEACHING AND LEARNING, STUDENT ASSESSMENT, AND GRADUATE EMPLOYMENT

4.1.	Students are prepared for independent professional activity

FACTUAL SITUATION

4.1.1. Teaching and learning address the needs of students and enable them to achieve intended learning outcomes

The content and structure of the field's study programmes allow students to consistently deepen their knowledge and strengthen the aimed competences. The studies include classroom work (lectures, practice works, laboratory works, consultation seminars, visits to companies, etc.) and other individual work. In addition to traditional assessment methods, such as laboratory work defence, problem solving, report of laboratory work or project, in order to promote student activity and creativity, active learning study methods are used, such as, project activities (projects design and visualization), problem solving-based learning, workshops, group work, experiential learning, discussions, interviews, problem-solving sessions, activity reflection, idea maps, etc. (according to SER).

Student's individual work covers an average of 50-60 % of study module hours in the full-time, and an average of about 80 % hours – in part-time study forms. During individual work, students perform the tasks of individual work provided in the programme of the study module and prepare for the planned assessments. Assessments are evaluated in accordance with the Regulations on the Assessment of Study Modules. It regulates the system and principles of the evaluation of the learning outcomes of the students of the KTU, the procedure of the assessments of study modules, the accounting of the learning outcomes and the requirements for the student's attendance in the classes of study modules. The individual work of a student is also related to preparation of bachelor's or master's degree final projects.

Different methods are used for the assessment of student achievements, which allow students to demonstrate the acquired theoretical knowledge and developed abilities, which are reflected in the outcomings of the module.

4.1.2. Access to higher education for socially vulnerable groups and students with individual needs is ensured.

KTU organises its activities by implementing the Equal Opportunities and Diversity and Violence Prevention Policy. KTU aims to provide equal opportunities for studies and work to all the community members, including the disadvantaged groups of students and the students with special needs – any direct or indirect forms of discrimination are not tolerated at the University. KTU emotional and social well-being policy aims at community members by creating such a study, research and work environment that does not tolerate hostile, unethical, humiliating or insulting actions that attack a person's well-being or dignity, physical or psychological untouchability. It is possible to adapt studies for students with disabilities or individual educational needs (physical, sensory disorders, autism spectrum, dyslexia, dysgraphia, mental health problems, other learning difficulties). The KTU follows the Religious Diversity Guidelines, which briefly introduce the main religions of the world. There is a constantly active survey for the students with disabilities and/or learning difficulties in the section "Emotional and Physical Health" of KTU website (according to SER).

ANALYSIS AND CONCLUSION (regarding 4.1.)

Factual situation is fully met. Learning methods help students to assimilate the learning content through activities, to develop skills of communication, cooperation, critical thinking, problem solving and independent learning. Clearly defined and regulated study-related procedures, processes and results ensure the smooth organization of the study process and monitoring of student progress. In the study modules of both the I-cycle and II-cycle programmes of the Electronics Engineering study field, different study and assessment methods are applied, selected according to the module's desired outcomes, which contribute to a high degree of student involvement in the study process and their active participation. Different methods are used for monitoring student progress to ensure timely identification of student learning gaps and timely decisions regarding learning progress. Students are provided with continuous feedback based on pre-defined criteria, which allows them to achieve the intended outcomes.

4.2.	There is an effective and transparent system for student assessment, progress monitoring, and assuring academic integrity

FACTUAL SITUATION

4.2.1. Monitoring of learning progress and feedback to students to promote self-assessment and learning progress planning is systematic

The report of the monitoring of the students' learning outcomes of FEEE and PFTB is used for the analysis of student learning outcomes. The Fields' Study Programme Committee of the FEEE and PFTB is constantly monitoring the students' achievements in the Academic Information System: the overall grade point average, data of the intermediate and final assessments of the current semester, the records of the attendance in classes. The Guidelines for the Identification of the Students' Learning Achievements, the Making of Comparative Queues and the Redistribution of the State-Funded Places of Studies regulate the annual identification of the levels of the student's studies. The students' achievements are also evaluated after each semester applying the Regulations on the Assessment of Study Modules. This information is automatically forwarded to the Early Warning System administered by the Study Centre of the faculty. The system monitors the indicators of the students' assessments of the modules and their attendance in classes, analyses the individual situation of students, carries out communication with students who fail to submit the documents justifying their absence to the Study Centre.

4.2.2. Graduate employability and career are monitored

The University monitors the indicators of the graduate employability according to the Education Management Information system. Formal and informal meetings are held regularly, during which the Heads of the study programmes listen to the opinion of entrepreneurs or graduates about the acquired competencies, and the applicability of those competencies in the workplace. The graduate survey is emailed to the graduate of the current and previous year. The graduate survey aims to learn about the career path of the graduates: assess the current career of the graduates and the contribution of studies to their integration in the labour market. Since 2004, the KTU organises the Career Days aiming to provide assistance to the graduates in their successful integration into the labour market. During the KTU career days, the University community actively participates in conversations with social partners in order to understand labour market trends and market changes. In addition they analyze the study programme with companies and whether it is necessary to make any changes to the modules or simply the possibilities of expanding the module's topics. KTU shows that the acquired professional preparation and competences of graduates are sufficient to pursue a career or get a job in the electronics sector (according to SER).

4.2.3. Policies to ensure academic integrity, tolerance, and non-discrimination are implemented

The University's administration assures compliance with the Statute of the University and KTU Academic Regulations. The Board of Academic Ethics ensures compliance with the Code of Academic Ethics. The University applies the Policy on the Ethical Use of Generative Artificial Intelligence in the Study Process at KTU. The University has prepared the Guidelines for the Plagiarism Prevention in the Written Works of the Students of KTU regulating the procedures for the similarity check and plagiarism detection, the types of plagiarism, the settlement of academic violations and the implementation of academic penalties. The KTU assures tolerance and non-discrimination by implementing the Equality and Diversity and Violence Prevention Policy. Its objective is to ensure equal opportunities of all the University's employees, students and the persons applying to the University, regardless of their gender, sexual orientation, disability, race, age, ethnic origin, nationality, religion, faith, language, origin, social status, convictions or views, citizenship, family status, intentions to have children.

In order to fully implement the principles of the European Charter for Scientists and the Magna Carta of European Universities, Kaunas University of Technology has to create an open environment where the individual differences, qualities, potentials and contributions of all of its employees and students are recognised and valued. Every employee and student must have the right to work and study in an environment that promotes respect for the dignity of each individual. The University shall strive for, uphold and ensure the realisation of the fundamental human rights enshrined in the Constitution of the Republic of Lithuania and the Charter of Fundamental Rights of the European Union, and shall have adopted an Equal Opportunities and Diversity Policy and established a University Equal Opportunities and Violence Prevention Commission.

The tasks of the University Equal Opportunities and Violence Prevention Commission:

- to examine reports (complaints) from members of the University community regarding violations of equal opportunities or violence;
- to provide consultations to community members on issues of equal opportunities and violence prevention;
- in cooperation with the Human Resources Management Department and the Student Affairs Department, to implement the policy of ensuring equal opportunities and preventing violence at the University and to carry out the prevention of equal opportunities violations and violence.

The Commission acts as an independent, objective and impartial body, without any prejudices regarding cases of discrimination, harassment, sexual harassment, violations of equal opportunities and violence, and persons who have committed potential violations.

4.2.4. Procedures for submitting and processing appeals and complaints are effective

The KTU applies the Guidelines for the Submission and Processing of the Students' Appeals and Complaints (according to SER). A lot of attention is paid to appeals and complaints in KTU FEEE and PFTB. Efforts are made to clarify student expectations and identify problem areas. An appeal or a complaint is transferred to the head responsible for the area of activities who sets up an interim board of appeal or a complaint settlement commission (consisting of at least 3 members including one representative of students). The student, who disagrees with the commission's decision, has a right to apply to the University's Dispute Settlement Commission.

ANALYSIS AND CONCLUSION (regarding 4.2.)

Factual situation is fully met. Academic progress indicators are recorded in two stages in full-time studies: in a signal interim assessment report during the 8th to 9th week of each semester and at the end of the session; in part-time studies after each session. During the semester, the student completes the assignments according to the timetable specified in the subject/module descriptions, and his/her progress is assessed by monitoring the evolution of the cumulative score.

The Guidelines for the Identification of the Students' Learning Achievements, the Making of Comparative Queues and the Redistribution of the State-Funded Places of Studies166 regulate the annual identification of the levels of the student's studies. The students' achievements are also evaluated after each semester applying the Regulations on the Assessment of Study Modules.

Students are provided with continuous feedback based on pre-defined criteria, e.g. feedback in all methodological sources such as EDU-Lab events. It is provided to students orally or in writing according to the assessment criteria or assessment rubrics based on them, students are able to contact teachers directly by email or through Moodle and initiate the appointment of additional consultation time if there is uncertainty about the assessment and feedback provided. The assessment criteria are given in the study module description and, in most cases, in Moodle, with the individual work assignments, which allows them to achieve the intended outcomes.

The progress of the I-cycle students preparing for the Bachelor's degree final project is constantly monitored by the supervisor according to the calendar plan and tasks, drawn up at the beginning of the final semester, which provides the stages and tasks of the student's final project preparation and their terms of assessment. In addition, during the 12th week of the semester, midterm defences of the Bachelor's degree final project are organized, during which students present the progress of the project preparation and receive feedback from the members of the departmental commission. The assessment of the midterm defence is recorded in the AIS, where it is recorded whether the midterm defence is completed.

The progress of II-cycle students who assess the study module Research Project and prepare the Master's degree final project during the last semester (in all II-cycle study programmes) is constantly monitored by the supervisor. In order to assess the research project, a seminar is organized, during which the submitted report is reviewed and students present the results of the work. In this way, the student's progress and work is assessed before the preparation of the Master's degree final project.

KTU monitors graduate employment and careers to ensure the quality of studies and to provide career planning services that meet the needs of students. KTU collects primary data on graduate employability by means of a questionnaire survey, and secondary data by means of telephone interviews and written surveys (enquiries sent to companies). According to the annual activity reports of KTU, the employment rate of graduates in the Electronics field 12 months after graduation was 54% in 2021, 81% in 2022 and 80% in 2023.

The principles and measures to ensure academic integrity, tolerance and non-discrimination are described in the Code of Academic Ethics of KTU. It sets out the values that guide the members of the academic community and outlines the ethical norms governing the relationships between members and the performance of their duties, as well as the duty of the academic community to observe standards of academic integrity, to be impartial and to be free from any personal prejudice in their decision making. KTU does not tolerate any form of academic dishonesty, the principle of academic freedom is recognised, the relations between the members of the community are based on the principles of collegiality, academic solidarity, respect for the dignity and autonomy of the individual; the students are guided by the principles of academic honesty and fair competition in the process of study.

Student appeals and complaints regarding violations of assessment or assessment procedures are examined in accordance with the "Description of the Student Appeals Procedure of KTU". This Description applies to students, unclassified students and persons seeking recognition of competencies acquired through non-formal and informal learning in all modes of study.

AREA 4: CONCLUSIONS

AREA 4	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Efficient organization of the study and monitoring of learner progress is ensured by clearly defined and regulated procedures and processes;
2. Students are provided with continuous feedback based on pre-defined criteria, which allows them to achieve the intended outcomes;
3. Employers and representatives of associations positively evaluate graduates of Electronics Engineering programmes and their preparation for the labour market. Almost 90 % of graduates get a job within 12 months after graduation.

AREA 5: TEACHING STAFF

5.1.	Teaching staff is adequate to achieve learning outcomes

FACTUAL SITUATION

5.1.1. The number, qualification, and competence (scientific, didactic, professional) of teaching staff is sufficient to achieve learning outcomes

The competence of teachers of the study field is assessed and approved in accordance with the qualification requirements set by the Republic of Lithuania and the KTU. The study process and the work of teachers are organized according to the provisions of the Labour Code of the Republic of Lithuania, the KTU Collective Agreement, the Academic Regulations of the KTU, the Regulations on the Workload Accounting of Academic Employees of KTU. The modules of the EE field's study programmes are coordinated and taught by 117 teachers, including 24 professors, 54 associate professors, and 39 lecturers (according to SER). The structure of the academic staff that implements the field study programmes meets the General requirements for the implementation of studies according to SER.

ANALYSIS AND CONCLUSION (regarding 5.1.)

The teachers of study programmes in the field of EE have many years of experience in academic work. Almost 75% of teachers in the field have been doing their academic work for more than 10 years, 23% – more than 20 years. The average age of the teachers implementing the programmes in the field of EE is 46 years. There are not many teachers who are 60 years old or older – only 10% (9% of all teachers), so there are no threats to the continuity of the study process (according to SER).

The teacher-to-student ratio is 235/29 or 8. In accordance with the Resolution of the Minister of Education and Science of the Republic of Lithuania (Government Resolution of the Republic of Lithuania No. 149 of 1 March 2017), the maximum threshold for the technological sciences field is set at 20 students per member of teaching staff. This ratio has been maintained. Of the total number of teachers of study field subjects, the percentage of teachers who work at least half time and have at least three years of experience is 79% (23 out of 29). 37% of teachers have PhD.

KTU provides opportunities for the development of teacher qualifications by organizing professional development courses, training, conferences, seminars, practical training in companies and trade shows both inside and outside KTU. The priority areas of teacher professional development identified by KTU are English language learning, development of digital competencies, and pedagogical studies to obtain the qualification of a teacher. All these activities are funded by KTU.

5.2.	Teaching staff is ensured opportunities to develop competences, and they are periodically evaluated

FACTUAL SITUATION

5.2.1. Opportunities for academic mobility of teaching staff are ensured

KTU employees are encouraged to use the "Erasmus+" mobility programme for teaching and training. "Erasmus+" staff mobility for teaching provides KTU teachers with the opportunity to go to the partner institutions of higher education for teaching or the foreign teachers to arrive to teach at KTU. The visits to the countries outside this programme are only available to the research and academic institutions that have cooperation agreements signed with the KTU.

The mobility of teachers and staff is mainly organised through the Erasmus+ programme. It offers the opportunity to teach in a HEI abroad, to take part in a traineeship, to work in a research institution awarded an Erasmus Higher Education Charter, or to work for another company/organisation. The most intensive cooperation takes place with HEIs in Portugal, Latvia, Germany and Turkey. The network of foreign partner companies is also being expanded in order to provide professional

development and internship opportunities for students. KTU encourages teachers to attend international conferences by covering travel and publication expenses.

5.2.2. Opportunities for the development of the teaching staff are ensured

The improvement of the competencies of the teachers of the KTU is conducted following the Guidelines for Improvement of Competencies of the Teachers of Higher Education Institutions approved by the Minister of Education, Science and Sport of the Republic of Lithuania which encourage the improvement of teaching/learning, research and general subject competencies of teachers. The KTU applies its approved Guidelines for the Development of Didactic Competencies of the Teachers defining the conditions and methods for the development of didactic competencies. The development of the didactic competencies of KTU teachers is ensured by the EDU_Lab Centre for Excellence in Learning and Teaching operating for the last five years. The teachers are constantly developing their scientific competence by participating in national and international scientific and scientific-practical conferences, research traineeships, long-term training, seminars in Lithuania and abroad. The teachers participate in international research, research (Horizon 2020, COST, Interreg, MITA, LVPA and LMT) and academic projects (Erasmus+, Marie Skłodowska-Curie, LMT tool, students' summer scientific internship and other) and improve their qualification in the fields of their research activities (according to SER).

ANALYSIS AND CONCLUSION (regarding 5.2.)

Factual situation is fully met. The qualification structure of the academic staff of the field of Electronics Engineering study programmes is properly balanced and meets the requirements described in the legal acts. High scientific competence and potential are confirmed by the active involvement of teachers in scientific research, participation in international scientific conferences, and scientific publications, the results of which are successfully integrated into the content of taught modules (according to SER and side visit). However, these conferences should be regularly attended (annually or biannually), which is important for continuous feedback from international peers, and also to follow the permanent development of the scientific area. The teachers of the field actively participate in didactic training; therefore, innovative, student-oriented study and assessment methods are used for the study process. Teachers have good conditions for improving their competencies, using both Erasmus+ mobility opportunities and other internal and external sources.

Foreign university professors and social partners – managers and experts of advanced business companies and other organizations participate in the implementation and development of study programmes of the field, who teach lectures or individual modules as invited guests, teachers-practitioners or visiting teachers, and also participate in the final project defence commissions. However, due to the low flexibility of the motivation system and complex recruitment rules, it is rather difficult to attract highly competent expert practitioners to the study process for a longer period of time (under an employment contract) at KTU. In order to attract young, promising researchers to academic activities, it is particularly important to find ways to enable them to receive higher remuneration for their work at the university, since the remuneration received by management specialists in the market is significantly higher.

AREA 5: CONCLUSIONS

AREA 5	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	

Second cycle				X	

COMMENDATIONS

1. High scientific competence and potential are confirmed by the active involvement of teachers in scientific research, participation in international scientific conferences, and scientific publications, the results of which are successfully integrated into the content of taught modules;
2. Foreign university professors and social partners – managers and experts of advanced business and other companies and organizations actively participate in the implementation and development of study programs.

RECOMMENDATIONS

For further improvement

1. Finding ways to achieve higher pay for university work in order to attract and employ highly qualified experts in the research process;
2. To involve Social Partners in active research activities to contribute to the research activities of the University community.
3. Attend more regularly (annually or biannually) some of the important international conferences

AREA 6: LEARNING FACILITIES AND RESOURCES

6.1.	Facilities, informational and financial resources are sufficient and enable achieving learning outcomes

FACTUAL SITUATION

6.1.1. Facilities, informational and financial resources are adequate and sufficient for an effective learning process

Information about the resources is available in the Library of KTU. Students and teachers can use the Library catalogue, KTU Virtual Library, more than 55 licensed databases, the resources of the Lithuanian Academic Library eLABa which provide access to teachers' research, teaching, research promotion and other publications, as well as doctoral dissertations and students' final degree projects. The KTU dispose of 445 rooms (16 amphitheatre classrooms, up to 225 workplaces for students, 149 classrooms, 54 computer classrooms, 220 laboratories, 6 meetings rooms, other premises – 6 teamwork rooms, 6 students individual work spaces, 13 multifunctional working spaces, 13 seminar rooms, 1 "Startup Space" meeting room). All premises for studies are equipped with the required hardware and laboratory equipment, computers and internet access and other software required for studies, projectors, the required audio and video equipment. There are 55 computer classrooms which size varies up to 36 workplaces (one computer classroom in PFTB has 60 workplaces). The KTU implements the project of the interdisciplinary prototyping laboratory centre "KTU M-Lab", on the basis of which an R&D-adapted infrastructure will be created – a unique interdisciplinary prototyping laboratory, where would be possible not only to carry out scientific research, but also to develop, manufacture and demonstrate prototypes.

The first engineering workshop "Fab Lab Kaunas" (Fabrication Laboratory) in Lithuania has been set up and opened at the KTU - it is a mini modern electronics factory which gives students the opportunity to get acquainted with all the processes of electronics manufacturing technologies, realise their ideas and projects by creating a real, factory prototype (according to SER).

The Department of Electronics Engineering is equipped with 12 modern laboratories of various profiles with specialized equipment. Fab Lab Kaunas, Fab Lab Kaunas Junior, Automotive Electronics Diagnostics laboratories were equipped with the help of sponsors. The equipment of Fab Lab laboratories was funded by UAB Kitron, UAB Wurth Elektronik Lietuva, UAB LTLAB, UAB Esemda and companies: Rohde&Schwarz and Ersa. The equipment for the Automotive Electronics Diagnostics laboratory was funded by UAB Baltic Diagnostic Service. According to SER and Site visit three computer classrooms with 12 workplaces each, are equipped with Windows 10, MS Office, MathCAD, MatLAB, MatLAB Simulink, Autodesk Master Suite, C++ and other software to ensure students' individual learning process. The KTU has purchased licenses for all the mentioned software and is constantly updating them. The available resources of the computer classes completely satisfy the students' need for individual work, since almost all students have their own computers at home or in the dormitory. An optical cable is laid to the student dormitory and all students living there have safe and fast internet access for individual work. All of this shows that equipment used for the field studies, including the software, is adequate for the current number of students and suitable to achieve the learning outcomes.

6.1.2. There is continuous planning for and upgrading of resources.

According to SER and confirmed during site visit KTU constantly invests in infrastructure renewal and is currently carrying out several large infrastructure modernization projects, for example the project for the creation of an interdisciplinary prototyping laboratory centre KTU "M-Lab". In the Department of Electronics the laboratories are renovated every year with their own funds. In 2021,

Fab LAB Kaunas was renewed by UAB Kitron. With the help of their own funds, the technical base of laboratories and multimedia and computer equipment for studies are being updated.

ANALYSIS AND CONCLUSION (regarding 6.1.)

Factual situation is fully met. Classes are organised in the main building of KTU and teaching block, and in the premises of the KTU Bosch Training Center, in 44 classrooms and laboratories equipped with a total of 1497 student workstations, 206 of which are computerised and 174 specialised. For existing software, technical support contracts are concluded (updated, extended) annually; therefore, KTU has the opportunity to constantly update software versions as needed. The software manufacturer provides an opportunity for students to download Autodesk Autocad, Dassault Systèmes SolidWorks student software licenses (Student version, Academic edition) following registration for work on their own devices. The license is valid for the period of study with an annual extension.

According to SER the improvement of the infrastructure and the renewal of the equipment needed for studies is also planned to be carried out in continuous cooperation with social partners, analysing the development of competencies needed by the specialists according to the market demand. Currently, facilities are insufficient to conduct applied research and experimental development. Therefore, a plan has been drawn up to allocate 651518,00 euro to purchase the equipment.

During the site visit, attention was drawn to the fact that it is necessary to be able to conduct practical laboratory work remotely, especially in master's studies and partially in bachelor's studies. Using real-time monitoring systems in specialized laboratories, it would be possible to form practical tasks for distance learning. Periodically update the existing methodological material, use all the possibilities provided by the virtual learning environment "Moodle", certify the created modules as e-methodical material.

AREA 6: CONCLUSIONS

AREA 6	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. A strong relationship with external partners allows to include the most famous global manufacturers in the process of laboratory modernization and to train students to work with the most modern and promising equipment used in modern industry;
2. A number of modern laboratories are equipped, where students get to know practically with the hardware and technologies that they study in the modules provided for in the programme;
3. Students have the opportunity to use the research equipment located in university institutes and laboratories and research centres.

RECOMMENDATIONS

For further improvement

1. It would be necessary to periodically update and certify the created modules as e-methodological materials.
2. Improve the effectiveness of using virtual laboratories and modules as e-methodological materials.

AREA 7: QUALITY ASSURANCE AND PUBLIC INFORMATION

7.1.	The development of the field of study is based on an internal quality assurance system involving all stakeholders and continuous monitoring, transparency and public information

FACTUAL SITUATION

7.1.1. Internal quality assurance system for the programmes is effective

The KTU implements its quality policy aiming to make the University a centre of attraction for students, teachers and administration, and make the University's study programme portfolio internationally competitive and compliant with market expectations, national priorities and trends. Assurance of the internal quality of studies at the KTU is based on a holistic approach to the processes taking place at the University, assuming responsibility for the quality of studies, including all social partners (students, teachers, administrative staff, graduates, employers) in the processes of improving the quality of studies, promoting a culture of continuous improvement and dialogue, which is nurtured by the values established in the University's mission, the provisions of quality assurance of studies of the European Higher Education Area, the principles of social dialogue and responsibility (according to SER).

Internal quality assurance is an integral part of the KTU's quality assurance system and is described in the Description of the Internal Study Quality Assurance System and on the KTU's website. The internal study quality assurance system is based on the European Union's key standards and guidelines for quality assurance in higher education (ESG), the European Union's key higher education policy documents (the Bologna and Copenhagen Declarations, the Berlin and Bergen Communiqués, the London, Leuven and New Leuven Communiqués, the Lisbon Recognition Convention, the Paris and Rome Communiqués), the European Qualifications Framework (EQF), the European standards and guidelines, and the main laws and regulations of the Republic of Lithuania regulating higher education.

7.1.2. Involvement of stakeholders (students and others) in internal quality assurance is effective

One of the foundations for ensuring and implementing changes that are important for the KTU community is feedback from stakeholders as one of the key elements of the University's efforts to improve the quality of studies. Feedback and evaluations from students, teachers, employees, alumni, and employers is based on round table discussions, evaluation of the quality of study modules and teaching, midterm evaluation of the quality of study modules, evaluation of the quality of the study programme, evaluation of the mandatory internship, evaluation of the quality of the competence, evaluation of the quality of preparation and defence of the final degree project, the student survey "Student Voice", the teacher survey on studies, the graduate career pathway survey, the employee satisfaction survey "Openly" and the employer survey (according to SER). The results of the surveys are used to improve study programmes and monitor student success, student-centred studies, improve the competencies of academic employees, mobilise the community, and set and implement long term goals related to responding to the needs of the study programmes, both for the University community and for the wider society.

7.1.3. Information on the programmes, their external evaluation, improvement processes, and outcomes is collected, used and made publicly available

University study activities are focused on creating value for society, contributing to the improvement and development of society. Accountability and creating an impact on society are provided in the Statute of KTU, the Academic Regulations of KTU, and the Strategy of KTU. All

documents related to the regulation of studies are available on the University's website and in the University's Document and Process Management System. The results of the external evaluation of the study fields are published on the University's website, as well as the results of the evaluation of study surveys. The results of the study surveys are also discussed at meetings with the University community and in the Faculty Study Committees and the Field's Study Programme Committees. The KTU, together with other Lithuanian HEI, is connected to the joint subsystem of the Government's strategic analysis centre (STRATA), which allows it to monitor the alumni careers after graduation. This subsystem monitors objective indicators (of state information systems and registers) that determine employment of graduates. Alumni career monitoring activities are coordinated at the University level by the Career and Service Centre of the Department of Student Affairs. Data on study programmes of the field are made public in the open information, counselling, and guidance system (AIKOS), the Study Quality Assessment Centre, on the website of the Association of Lithuanian HEI for Centralised Admissions (LAMA BPO).

7.1.4. Student feedback is collected and analysed

According to SER The students have the opportunity to anonymously express their opinion about the quality of individual modules of their study programme in the "Survey on Study Modules and Teaching" at the end of the autumn and spring semesters. The purpose of this survey is for each study module to be evaluated by all students who have chosen it, and thus contribute to its improvement. The results of all feedback surveys carried out at the University and the faculty are systematically analysed by the Faculty's Study Quality Committee, and the Field's Study Programme Committee, presented and discussed at faculty meetings, and measures to improve quality are provided.

ANALYSIS AND CONCLUSION (regarding 7.1.)

Factual situation is fully met. From gathered information from SER we can assume that the internal quality assurance system of the programmes is effective at the KTU Study programmes are developed, implemented and updated in accordance with the Bologna Process in the field of quality assurance: clear quality policy and continuous quality improvement , approval, monitoring and periodic evaluation of study programmes and qualifications, evaluation of students' achievements, quality assurance of teachers' performance, provision of study resources and support to students, maintenance of the information system, mobility of students and lecturers, and provision of information to the public. KTU implements the following study quality assurance processes – monitoring of study programmes, quality management of academic performance assessment, assurance of pedagogical competence of teachers, assurance of learning resources and student support.

According to SER the involvement of stakeholders (students, etc.) in internal quality assurance is not fully effective, as information on graduates' and employers' attitudes towards graduates' professional training and competences is not collected, but only analysed through data from the analytical journals Education and Higher Education Rankings.

AREA 7: CONCLUSIONS

AREA 7	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings

First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Students participate in the feedback system at various levels and forms.
2. Surveys, discussions, etc. are carried out systematically, provide the necessary feedback and provide the necessary which allows for continuous and periodic monitoring of the quality of study programs in the field of study and changes in satisfaction of students and teachers.
3. Continuously integrate the principles of sustainable development into all activities of the University: Studies, science and administration, raising awareness and involvement of the KTU community and improving infrastructure.

RECOMMENDATIONS

For further improvement

1. Creation of a uniform information system because Academic information system is collected in different subsystems.

V. SUMMARY

The panel would like to thank the KTU community for the excellent work done in preparing the self-evaluation report. The information necessary for the assessment process is presented in a very detailed and clear manner.

During the meeting with the senior administration, self-evaluation report group, teaching staff, students, social partners and employers, graduates (alumni), there was a sense of peace and relaxation, everyone communicated freely in English, freely knew how to express their thoughts and express their position on a particular issue. The assessment, which lasted a whole day, shows that the University community is very closely connected at all stages and that everyone cares about each other and tries to help, understand, grow together, learn together and achieve new goals by cooperating together. University lecturers are very focused on teaching and preparing students for work, so sometimes they forget about writing and publishing their research papers.

The panel would like to recommend that lecturers also discuss their research topics with business representatives so that they can contribute their support to their research topics. It is very positive that the University is able to attract a lot of support from business representatives in the region.

KTU installed a few new laboratories, provided additional scholarships for students for certain achievements. This shows how important engineering science is in society and that a well-educated person is important for business and society.

Students are provided with the latest theoretical knowledge, international scientific opportunities to go abroad for a semester or two, international practices and skills in the latest laboratories that meet today's trends. Attention is paid to the integration of science and business and the preparation of students for future work.

These studies educate specialists who are able to create advanced and innovative electronic systems, applying the latest design methods and practical knowledge. During studies of electronic engineering students will deepen the theoretical knowledge, practical skills necessary to design hardware and software, analyze production processes and models, evaluate complex systems and integrate them. Great attention is paid to research based solutions, focused on implementing innovations and creating technological solutions that meet the needs of industry and contribute to technological progress in various fields.