STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

VILNIAUS TECHNOLOGIJŲ IR DIZAINO KOLEGIJOS

STUDIJŲ PROGRAMOS

AUTOMOBILIŲ ELEKTRONIKOS SISTEMOS

(valstybinis kodas –653H61003)

VERTINIMO IŠVADOS

EVALUATION REPORT

OF *CAR ELECTRONICS (state code –653H61003)*

STUDY PROGRAMME

at VILNIUS COLLEGE OF TECHNOLOGIES AND DESIGN

Experts' team:

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Išvados parengtos anglų kalba
Report language – English

Vilnius
2015

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	**Automobilių elektronikos sistemos**
Valstybinis kodas	653H61003
Studijų sritis	Technologijos mokslai
Studijų kryptis	Elektronikos ir elektros inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3 metai), ištęstinė (4 metai)
Studijų programos apimtis kreditais	180 ECTS kreditų
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Elektronikos inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	2012 - 05 - 09, SV6-19

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	**Car Electronics**
State code	653H61003
Study area	Technological Sciences
Study field	Electronic and Electrical Engineering
Type of the study programme	Higher Education College Type
Study cycle	First Cycle Studies
Study mode (length in years)	Full-Time (3 years), Part-Time (4 years)
Volume of the study programme in credits	180 ECTS credits
Degree and (or) professional qualifications awarded	Professional Bachelor in Electronics Engineering
Date of registration of the study programme	09-05-2012, Order. No. SV6-19

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I. INTRODUCTION

1.1. Background of the evaluation process

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

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

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

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

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

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

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

1.2. General

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

No.	Name of the document
1.	List of staff and students´ projects

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

Vilnius College of Technologies and Design (hereinafter - VCTD) was formed on September 1, 2008 by the Order No.785 by the Government of the Republic of Lithuania after merging the reorganized Vilnius Technical College with Vilnius College of Construction and Design. The title of Vilnius College of Construction and Design was changed into Vilnius College of Technologies and Design (hereinafter – College, VCTD). VCTD is the largest college of technological and artistic studies orientation in Lithuania. However, the origin of different faculties

dates back to as far as 1930s (Technical School). Petras Vileišis Railway Transport Faculty roots from 1947, the establishment of Vilnius Railway Transport Technical School. Civil Engineering Faculty evolved from Vilnius Technical School of Construction, established in 1954, and so did the Design Faculty. VCTD is a state higher education institution providing higher professional education in the study areas of technologies, arts and social sciences, having great experience in specialist training and long - living traditions. The founder of the College is the Government of the Republic of Lithuania. Studies at VCTD are oriented towards practical application of knowledge, focused on cooperation with industry and business structures.

Vilnius College of Technologies and Design consists of four faculties: Faculty of Design, Faculty of Construction, Petras Vileisis Faculty of Railway Transport, and Technical Faculty. In Vilnius College of Technologies and Design are implemented 19 study programs. Technical Faculty provides six study programs (Electric Power Engineering, Car Electronics, Electrical and Automation Engineering, Technical Maintenance of automobiles, Mechanical Technologies Engineering, Renewable Energy). Study programme *Car Electronics* has been taught at the Technical Faculty since 2012.

The study programme (hereafter – SP) *Car Electronics* has been implemented since 2012; the external evaluation of the study programme was conducted first time by the present evaluation panel in 2015.

1.4. The Review Team

The review team was completed according *Description of experts' recruitment*, approved by order No. 1-01-151 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on *13/11/2015.*

1. **Prof. dr. Edmund Handschin (team leader)** *Faculty of Electrical and Information Engineering, Technical University of Dortmund, Professor emeritus, Germany*
2. **Prof. dr. Tadeusz Skubis,** *Institute of Metrology, Electronic and Automatic Control. Faculty of Electrical engineering. Silesian University of Technology, Professor, Poland*
3. **Prof. dr. Toomas Rang,** *Thomas Johann Seebeck Department of Electronics, Faculty of Information Technology, Tallinn University of Technology, professor, Estonia*
4. **Doc. dr. Dainius Balbonas,** *Department of Electronics and Electrical Engineering, Faculty of Technology and Natural Science, Šiauliai University, Head of department, Lithuania.*
5. **Mr. Rytis Koncevičius,** *PhD student of Informatics study programme, Faculty of Informatics, Vytautas Magnus University, Lithuania.*

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

Study programme (hereinafter - SP) Car Electronics is designed to prepare highly skilled professional bachelors in electronics and electrical engineering who can work in the local and in foreign companies. Prepared professionals are able to work in the automotive industry and second market companies in different positions: diagnostics, repair, design, and management. Car electronics graduate programme has no specializations.

The name of SP is different in English and Lithuanian language. In English – Car Electronic, in Lithuanian – Car electronics systems (liet. Automobilių elektronikos sistemos). During the on-site visit the administration, the self-evaluation group and other members of staff were asked to explain the situation. Explanations from all these groups were the same i.e. the correct version is Lithuanian: Car electronics system; the English version (Car electronics) is a translation mistake. This situation caused reason why the SP name is a strong misalignment with the subjects in the SP. Furthermore it seems that the teaching staff does not understand the implication of "electronic systems".

The aim of the SP is quite clear and well defined. However, the learning aim is too wide because it also covers the design of car electronics systems. The design of car electronics systems is not the main learning aim for the college graduates. Also the design aim is very weekly covered by the intended learning outcomes and not at all covered by the subjects taught. The SP has only one learning outcome dealing with design: “Will be able to design automobile electric and electronic devices, industrial and technological processes and automobile diagnostics systems technological process”. The learning outcome is related with subjects such as Power Supply Systems, Analogous and Digital Devices, Fundamentals of Measurements, Data Transmission systems, Diagnostics Systems, Final Practice, Final Project; all these subjects cannot realize the learning outcome dealing with design of electronic systems.

In general it is noted that most learning outcomes are compliant with the requirements of legal and regulating documents establishing academic and professional qualification requirements for trained specialists and compatible to the cycle and the sixth qualification level of studies. The SP includes eleven study outcomes in five groups. The evaluation team emphasizes that the intended study outcomes are not conducted under all international standards. For example such standards as TUNING-AHELO provide the allocation of more than 20 outcomes to certain groups: *Basic and Engineering Sciences; Engineering Analysis; Engineering Design; Engineering Practice; Generic Skills).* Such a distribution of the outcomes cannot be observed in the SP. Also learning outcomes of course studies has little to no relation with

learning outcomes of SP according any international standard. Most of the subjects have relations with one or two study outcomes.

Access to the SP aims and key learning outcomes are available on the VCTD website and "AIKOS" Information system. The information is accessible to the public. It is notable that the SP aims submitted in the self-evaluation report (*hereafter* – SER) and the profile of the SP listed on the website are not entirely the same. The evaluation group would expect information in these resources to be in close agreement.

The evaluation team agrees that SP offers adequate study methods, which stimulate intellectual, communicational, learning to learn abilities but the study name, aim, and outcomes must be strongly upgraded and better aligned with course outcomes to ensure the achievement of the skills necessary for the labour market.

Also some technical inconsistencies are noted between (SER) 1.1 chapter and Annex 1 because of names of subjects. It is unclear what subjects realize outcomes, because of different subject names and lack of some subjects.

Inconsistencies with subjects' names

Table 1

Subject name in SER table 2, name of the table **Correlation of Aims, Outcomes and Subjects in the Study Programme**	Subject name in SER Annex 1 Name of the Annex 1 **Study Subjects Descriptions**
Structure of Cars	Automobile construction
Fundamentals of Electrical Engineering	Electrical Engineering
Fundamentals of Electronics and Automation	Electronic and automation basics
Data Transmission Systems	Data communications systems
Economics of Enterprises	Enterprise Economics
Fundamentals of Microprocessor control	Microprocessor basics
Electric and Electronic Devices and Control	Electrical and electronic devices and management
-	Engine management systems
Fundamentals of Measurements	Measurement Basics
Hybrids and Electric Transmission Cars	Hybrid and electric drive automobiles
Security and Comfort Systems -	Safety and Comfort Systems
Intellectual Traffic Control Systems	Intelligent Traffic Control Systems
Practice of Electronic Equipment Tune-Up	Electronical Equipment Tuning Practice
Industrial Practice	Production Practice
Electric market	Electricity Market
Power engineering history	History of Energetics
Document Management	Document Administration
Illumination Technics	Illumination Technology
Power Supply Systems	-
Welding technology	-

Despite the criticism, the evaluation panel still considers this area as satisfactory. Some of inconsistencies are more problems of management. Some problems concerning outcomes and the name of study program can be solved quickly.

2.2. Curriculum design

The curriculum design meets the legal requirements. The structure of the SP is based on the requirements for college studies. The scope of the SP, its subjects, contact and individual work hours fully correspond to the requirements of legal acts and other legislation documents of the Republic of Lithuania. The SP plan is presented in the SER (p. 37-38). The duration of the SP is established on 3 years (6 semesters), its length in credits is 180 credits (one semester – 30 credits) for full-time studies and 4 years (8 semesters) its length in credits is 180 credits (one semester – 22-23 credits) for part-time studies.

The study subjects are spread evenly, their themes are not repetitive. All study subjects in the SP are divided into general college study subjects (15 credits, 4 subjects), study field subjects (135 credits, 28 subjects) and specialized study subjects (30 credits, 6 subjects).

The evaluation team would like to outline a rather important critical remark: the name of the study programme does not match with the curriculum design. The presented study curriculum cannot fully implement the intended aims and learning outcomes of this SP. Also important topics are missing in the curriculum: Basics of programming, basics of microcontrollers, multimedia systems in cars, emission and pollution aspects, standards, EMC. Some of these subjects concern basic electronics, other subjects deal with car equipment and diagnostics. All the mentioned topics should have their own study module (course) and not included in other module (course) as small few hours topics. The study curriculum part named “specialized study subjects” consists of subjects dealing with applied research and three optional subjects. In SER chapter 1.2 is written that students can choose and study optional subjects of their liking in any faculty of the College. But on SER chapter 3 is written that students can select optional subject just from free variants. Most of the optional subjects are not useful for students, so it is better to change them to more useful subjects or to change optional subjects to free elective subjects. During the on-site visit it was explained that these optional subjects are free elective. But the question remains why they are in “specialized study subjects” group.

Almost the same remarks can be made for the part-time studies curriculum. Some extra remark for part-time studies can be made because many subjects are divided into two parts. Because of such breakdowns each semester of part-time studies have 6-7 subjects and it is not clear how it will help to better achieve the intended study outcomes.

In general there are logical links and sequence of study subjects in the SP. But the sequence of subjects requires some remarks. The subject “Physics” is spread into to two semesters with 3 ETC in the first semester and 6 ETC in the second semester; but the individual contact hours are divided in such a way that 8 hours are in the first semester and 90 hours in the second semester. During the on-site visit in HEI this inconsistency was explained that in the first semes-

ter students have theory and in the second semester they have laboratory works. The subject "Electronic and automation basics" and the subject "Analogue and digital devices" are both in the third semester. It is suggested to introduce the subject "Electronic and automation basics" earlier than "analogue and digital devices" because of their interdependency. The subject "measurement basic" can be introduced earlier than in the fifth semester because students do some measurement earlier.

The SP has five different practices (each practice is 6 credits), the sequence of practise is well organized. Also some reflection can be made here, that some practise especially final practise, are too short.

In SER chapter 1.2 the following inconsistencies appeared: in table 5 it was explained that full time studies have eight semesters, six subjects, and two exams in each semester; however according to SER chapter 3: full time studies have six semesters, seven subjects, and three exams in each semester. Also part-time studies have 6-7 subjects and 2-4 exams in almost all semesters. There is no explanation how such a small number of exams will help to better achieve the intended learning outcomes.

On the positive side, the courses are well covered with several textbooks, typically in Lithuanian language, what makes the studies easier for the students. However, almost all cited books are more than five years old. There is no English literature and hence the incoming Erasmus students do not have any possibility to study subjects in this SP. The lack of literature in English limits the possibilities to get the newest information in various fields of study. For example the modern subject "Intelligent Traffic Control Systems" is covered with four books. One of them is the road traffic regulations book for new drivers; the other three books are 8-11 years old and none of them is in the college library.

Some subject of SP as hybrid and electrical drive automobiles, robotics, intelligent traffic control systems or renewable energy technologies reflect the latest achievements of technologies. But these subjects need newer literature especially in English language.

In conclusion it could be said that although there are significant flaws in the curriculum and it's relation to the learning outcomes, the international panel still considers this area as satisfactory because the program is new and not all problems mentioned here are very critical.

2.3. Teaching staff

The teaching staff involved in teaching of the SP meets the legal requirements. At present, the number of the teaching staff is adequate to ensure the intended learning outcomes. On the basis of Republic of Lithuania Law on Higher Education and Research, certification of teachers is organized every five years to determine whether the performance of teachers for

teaching positions is in line with the qualification requirements set out in the description of the qualification requirements, followed by competition to fill in teaching positions.

The majority of the teachers have large practical and pedagogical experience. Some of the teachers are from industry and this is a positive point. The total number of teachers of the SP in the last year was 39; among them aged over 60 years 25,6%, in the range of 46-60 30,8%, in the range of 31-45 25,6% and up to 30 18% teachers. This is a positive parameter because teachers by age are distributed evenly and it ensures generational change. Among 39 teachers 8 have doctoral degree, and 3 are PhD students. Looking deeper into the qualification structure only one doctor teaches subjects which have close relation with the profession; other science doctors teach general subject such as "Law", "Applied mechanics", "Economics theory", "Physics". 20 % of the lecturers have an educational background in electrical and electronic engineering.

The teachers participate in various activities such as applied research projects, training projects (including technical training organized by automotive companies in Lithuania and abroad), and international calibration projects (Erasmus, *Grundtvig*). But on the other hand there is some negative tendency: in the academic year 2012/2013 26 teachers took part in 70 various activities; in the academic year 2013/2014 34 teachers took part in 48 various activities; in the academic year 2014/2015 39 teachers took part in 49 various activities. During the last three years 13 teachers have made outgoing visits and 12 incoming visits are from other countries. This parameter is good enough because 1/3 of stuff already have visits abroad during last 3 years.

The evaluation team wishes to emphasize that the number and level of applied projects are currently at a low level. During the on-site visit the evaluation team received an extra document "List of staff and students projects". In this list 18 projects are listed: five of them are just student projects (freedom of expression in HackLab – student work room), four of them are internal VCTD projects, other four projects have no relation with transport or car electronics, from the last five projects one was made with VGTU, one with JSC "TUVLITA", and three with the public company "Vilnius Public Transport". Also there is no information how much money or donations were collected while doing these different projects. Despite the fact that projects are not high-level college team deserves praise for its efforts to grow.

All teachers of the SP have equal conditions to improve their professional qualifications in a chosen form. Professional development of teachers in areas of pedagogical, scientific or practical areas of activity is regulated by the descriptions of qualification requirements. During refresher courses teachers receive their salaries, studying teachers are provided vacations for the purposes of their studies.

The SER chapter "Staff" covers short analysis of scientific papers and methodical books for students. According to the submitted teacher CVs during the last three year SP teachers write 49 conference proceedings including few papers in that number. 55% of them were published in the local VCTD conference proceeding journal "Technology and the Arts". In conclusion, the average result is 1,4 conference proceedings (half of them in local conference) for one teacher during the three years period. The number of conference proceedings and papers can be higher keeping in mind that there are eight doctors in this SP. Furthermore the evaluation team noted during the on-site visit that the level of English knowledge of the teaching staff is weak and must be increased. This can be a barrier for a more active participation in conferences. Otherwise college must more concentrate to applied research instead of high quality papers. But in both ways the knowledge of English is too low and still applied research is not also a very strong part of the stuff in SP.

Also in the SER it appears that there are some critical inconsistencies between appendix 2 and appendix 3: half of the teachers declare in their CV (appendix 3) different subjects than the SER reports in appendix 2. Two teachers do not declare in their CV that they work in VCTD. One gets the impression that the SER group has not prepared properly the lecturers' CV and it is not clear which personnel is working in the SP.

2.4. Facilities and learning resources

The premises for studies are adequate both in their size and quality. The VCTD facilities ensure 100% implementation of the SP by the rooms. Totally 22 rooms and 18 laboratories are in use. Auditoriums and laboratories used for study meet the requirements for work safety and hygiene normative HN 102:2001 (SER p. 19). College implemented a project subsidized by EU structural funds "*Vilnius College of Technologies and Design, Studies Infrastructure Modernization*", by means of which reconstruction of the building of the Technical Faculty and renovation of laboratory equipment in the building block have been performed.

From the SER (table 10) it is not clear what kind of subjects in the classrooms or laboratories are carried out. But it seems that rooms and laboratories for studies are adequate both in their size and quality. Laboratories are well equipped.

Students are working with specialized software: *BOSCH ESItronic, Autodata, Toyota techdoc, Solidworks, AutoCAD, Ni Multisim 11.0, and ElectronicWorkbench*. Also students are using modern diagnostic devices: automobiles diagnostic module *Bosch FSA-740*, diagnostic devices *Bosch KTS-570, VAG-COM*, gas analyzer. For analog, digital and power electronics the students use KL-200, KL-300 and KL-500 stands. Also VCTD has well equipped "Toyota" training class. Toyota training class equipment: simulators–automobiles *Lexus LS460* and Toyota

Yaris, automobile diagnostic devices *Intelligent Tester 2*, *Toyota Diagnosis Tester GTS TD3 LITE PANASONIC EU*, LCD monitor with a special trolley, running petrol engine stand *2NZ-FE*, manual gearbox C50 model, "Lexus GS450h" hybrid transmission, engine model with *Valvematic* system, Toyota *Multidrive SK111 Transaxle Cutaway* (gearbox with the variator model), exhaust extraction system and other equipment. It is only part of the equipment that students of college can use for their studies. College can boast about the good cooperation with Toyota Baltic. This company accommodates the college with equipment for more than 110.000 € during the last six years.

At present, students can use 95 personal computers in the auditoriums of information technologies and the library. For the aims of the SP *Car Electronics* VCTD library has 690 copies of 40 titles of specialized publications. The number of books is quite small in view of the fact that the SP in both study forms has more than 200 students. Furthermore some books can be used by other SP. In 2013 the library of VCTD subscribed for 90 science popularization, analytical and actualities publications, some of them are suitable for students form *Car Electronics* SP. Every year the library enriches its fund of books with new publications. The library of the college offers students and teachers four subscribed databases. Furthermore subscribed databases are not very useful for electronics students. Also the college library subscribes electronic books issued by the VGTU publishing house "*Technika*", which can be read on the internet.

The college has a good plan to update methodical means and materials, and prepare methodical provision to accommodate every study subject to Moodle environment.

The level of facilities can be described as very good, but there is some shading that suggested the evaluation group not to consider this area as an exceptional one for this specific study programme, the reasons behind this are: Rather narrow diagnostic equipment mostly based on Toyota equipment (unlisted simple diagnostic equipment which is mainly used by automotive services) and the needs to update laboratory equipment in near future after updating the topics in the curriculum. The specific laboratory equipment is more related to diagnostics than to electronics. It can be concluded that the majority of specific equipment is better suited for other study programme – Technical Maintenance of Automobiles.

2.5. Study process and students' performance assessment

Admission to the SP *Car Electronics* is conducted during the general admission following standard procedures in Lithuania. The only admission requirement is secondary education and the results of the maturity examinations. Students are admitted with a range of competition grades. In 2014 for full-time studies the range varied from 1,98 to 4,84 at state-funded studies and from 0,76 to 2,11for not state-funded studies (max. grade 10 points). For part-time studies

completion grades are similar. It seems that the motivation of not state-funded student is very low. During the last three years student admission to the SP in full-time decreased from 73 (61 state-funded) in 2012 to 52 (34 state-funded) in 2014; the student admission to SP in part-time studies was quite stable. However, the specific action plan for attracting students to full-time studies under this SP was not presented in the SER.

Student dropout rate is quite normal for full-time studies. Around 70% of enrolled full-time students successfully graduate from Car electronics SP. The dropout rate for part-time studies is relatively high and reaches 50%. Mostly students cancel their studies at their own request, other drop out reason non-attendance to lectures or exams.

The students of the SP are encouraged to participate in the applied research activities: in practical science conferences, contests, prepare and read reports in conferences. Every year students from this SP take part in the conference "Information systems in studies and creation"; moreover they participate in the activities of the innovation laboratory "VTDK hackLAB" and various projects, e.g. "*Sports car: Student formula"*.

The students have access to mobility through the Erasmus program. VCDT has 40 Erasmus contracts more than 10 are suitable for students from Car Electronics SP. Students are selected on a competitive basis. The mobility of students is very low: only 2,4% of all SP students took part in ERASMUS exchange programs (four in 2013/2014 and two in 2014/2015). It seems that there is a lack of motivation to go abroad amongst students. It is suggested that the advantages of mobility should be made clear to the students. During the on-site visit the college administration told that the problem is a lack of Erasmus places (financing), but the students told that the main barrier is the lack of suitable Erasmus places and the language barrier.

The assessment system of student performance is clear and adequate. The Colleges ensures an adequate level of academic and social support. The first year students have introductory lectures about the SP, choice of optional subjects' curricula, timetables, and procedures for financing, social support receipt, and mobility possibilities. During the first lessons subject teachers make the students familiar with the curricula of their subjects, aims and learning outcomes, assessment system and criteria, academic accounting form, availability of consultations and explain the meaning and influence of the taught subject in the further study process and impact on future professional activity. The students can get social and study grants and state supported loans. For not state-funded students the fee for studies is allowed to be paid in installments. Students are provided accommodation in renovated hostels. The organisation of the study process ensures an adequate provision of the programme. The students from SP Car Electronics achieved more than 30% of study grants in the technical faculty.

During the on-site visit the students expressed their satisfaction with the interaction between teachers and students. Also students express their satisfaction with this SP. Good feedback about learning outcomes is given from the teachers to the students.

In the SER it was not clearly expressed the ways and control mechanisms of the individual studies of students. During the on-site visit the evaluation team understood that it mainly depends on the teachers' attitude and skills and there is no systematic approach to this part of studies.

2.6. Programme management

The first and very important note of the evaluation team is that the quality of the SER is at a low level. There are inconsistencies and conflicts between the various annexes and the SER text; the number of such mistakes is quite big. Also the different names of SP in Lithuanian and English languages are also a question of management quality.

The SER describes the responsibilities of Dean, Committee of *Car Electronic* SP, and possibilities of student and industry to influence the SP. The Committee of *Car Electronics* SP is responsible for the initiation of updating the SP, supervision of the quality of the performance of the SP and its improvement. Also the Committee of the SP submits proposals to the Dean concerning the improvement of study subjects or development of the new ones and analyze issues regarding specialist training. The Dean of the Faculty assures the quality of studies organized in the Faculty, and initiates consideration of curriculum changes and their approval by the Faculty Council. Improved SP is submitted for approval to the Academic Council. Students express their opinion about the SP, its implementation and update through Students' Agency, its representatives in the Committee of the SP, the Faculty Council and the Academic Council. Students' opinion about individual subjects of the SP and the quality of teaching is judged through questionnaires at the end of each semester. Also information and data on the implementation of the programme are regularly collected and analysed.

According to staff surveys, the majority of staff is aware of programmer maintenance and renewal process and think that the system is operating correctly. During the on-site visit the students, the alumni and the industrial partners express their satisfaction with this SP.

During the visit evaluation team find out that majority of SP graduates already working in local automotive services or in other companies related to electronics.

Analysis of the structure of this Study Programme management showed that decision-making responsibilities between Dean and Program Committee are clearly allocated and presented. The evaluation team agrees that the programme management procedure is well defined on paper. But during the on-site visit it was observed that SP management procedures are not implemented in practice; it is not reflective to information coming from outside. It is not clear how

the students´opinion affects the SP curricula and subjects during the last three years. The main feedback from industry came only after industrial practices in enterprises. The feedback from industry is episodic and participation in SP implementation and quality assurance is week. The representatives of industry were not introduced to the results of SER and to the study curriculum at all. The teachers of SP are only interested in their own subjects and a little bit to topics related to their own subjects. The teaching staff does not know the future direction for the further development of this SP. There is no opinion among teachers what is most important in this SP (the center of gravity in this SP is not well defined): maintenance and diagnostics of electronics systems or design of electronic systems. During the on-site visit the evaluation team asked but did not receive a convincing explanation how this new SP on Car Electronics will strategically be supported by the college administration. Furthermore no strategic development plan for the technical faculty was presented. The support from social partners is episodic and narrow. In the SER it is mentioned that the SP received support from one social partner, totally more than 110 000 €, but 90% of this donation was received before this SP started and hence it possibly was devoted for other SP such as "Technical Maintenance of Automobiles". The difference between these two SP is about 48-60 credits (practice and the final works was not counted). Significant overlapping of these two SP exists. The merge of the two SP is one option to improve this situation. To have one strong SP with two strong specializations can be a solution to achieve better management of studies.

Generally, students have opportunities to participate in student mobility programmes, but the participation in Erasmus is low. According to students the problem is bad dissemination of information, lack of suitable Erasmus contracts, motivation and knowledge of English language. But according to the administration the main reason is the lack of ERASMUS financing.

Despite the criticism in terms of learning outcomes, curriculum design and programme management, the evaluation panel believes this programme should continue to run and make significant improvements to secure its future.

III. RECOMMENDATIONS

1. Harmonize the SP name, aim, learning outcomes and curriculum with each other and ensure that all SP outcomes are covered by adequate study subjects.
2. Introduce new topics into the curriculum such as: Basics of Programming, Basics of Microcontrollers, Multi-media Systems in Cars, Emission and Pollution aspects, EMC and EUR-ACE or TUNING-AHELO Standards.
3. Renew the study material for modern subjects like – intelligent traffic control systems (literature is 9 – 12 years old), renewable energy technologies (literature is 8 – 11 years

old and not related to, renewable energy in transport electronics), robotics (literature is 4-10 years old and related just to LEGO *MINDSTORMS),* hybrid and electrical drive automobiles (literature is 6 – 9 years old), etc.

4. Expand the number of the publications in international conferences and increase scientific activity.
5. Increase collaboration with companies and various institutions to get new and high level projects.
6. Increase the level of English language proficiency among the staff.
7. Develop a plan for attracting the more talented pupils from secondary schools. Increase students´ motivation.
8. Increase the mobility of students by adequate motivation. The advantages of mobility must be clear for student, some extra English language courses can be suggested, appropriate Erasmus places must be offered for students.
9. Implement the quality management system to real life; currently it only works in a formal documented level.
10. Improve the co-operation between teachers themselves, also between teachers and administration to find out future direction and further development of this SP.
11. Prepare a strategic development plan for the technical faculty.
12. Enhance the dissemination of information between the administration and students.

IV. SUMMARY

The aims and learning outcomes of the SP are publicly available. SP has adequate study methods, which stimulate intellectual, communicational, learning to learn abilities.

The different versions of SP name in English and Lithuanian language. The aim of this SP is too wide and covers difficult activities as designing. Part of the aim of the SP is weekly related with the intended learning outcomes and not at all with the offered subjects. There were mismatches between outcomes of the SP listed in the SER and the profile of the SP listed on the website. Study outcomes are not developed according any international standards. There are unclear what subjects realizes outcomes, because of different subject names in SER and Annex 1. A small number of study outcomes provides an incomplete overlap with the study aims.

Study subjects are spread evenly; their themes are not repetitive. In general there are logical links and sequences of study subjects in the SP.

The name of the SP is inconsistent with the curriculum. With the presented curriculum it is impossible to reach the intended aims and part of the presented learning outcomes. The curriculum does not have important topics such as Basics of Programming, Basics of Microcontrollers, Multi-media Systems in Cars, Emission and Pollution aspects, Standards, EMC. It is not clear what added value for students result from the optional subjects in the subject group "specialized study subjects". Lack of newer literature for modern subjects, especially in English language.

Good level of the SP teaching staff qualification. Good distribution of teachers by age. Teachers have the opportunity to improve their qualification and they make use of it. The teachers actively participate in various activities such as applied research projects, training projects (including technical training organized by automotive companies in Lithuania and abroad), and international calibration projects (Erasmus, *Grundtvig*).

SER chapter "Staff" cover short analysis of scientific papers and methodical books for students. The analysis of CVs shows week scientific activities for staff consisting of 39 teachers and 8 doctors among them. Small number of applied research projects outside the college. It is not clear what subject teaches half of the staff because different information is given in appendix 2 and appendix 3. Two teachers in their CV do not declare that they work in VCTD. Some CVs are missing in appendix 3.

The premises for studies are adequate both in their size and quality. Auditoriums and laboratories used for study meet the requirements for work safety and hygiene normative HN 102:2001. Libraries, computer labs and reading rooms at the University and Faculty are accessible for a reasonable period during daytime. Good cooperation with Toyota Baltic. There are high quality laboratories for diagnostics (Toyota and Bosch). It is worthwhile to update methodical

means and materials, and prepare methodical provision to accommodate every study subject to Moodle environment.

It could be useful to introduce simple diagnostic equipment which is mainly used by automotive services equipment in diagnostics laboratory (unlisted simple diagnostic equipment which is mainly used by automotive services, equipment is mostly based on Toyota). The library of the college offers students and teachers four subscribed databases. Furthermore subscribed databases are not very useful for electronics students.

Admission requirements are well-founded; the higher education institution ensures an adequate level of academic and social support. The students receive clear information regarding the assessment criteria. The students of the SP are encouraged to participate in the applied research activities, innovation laboratory VTDK.hackLAB, and various projects, e.g. "*Sports car: Student formula".* Students express their satisfaction with this SP. Good feedback about learning outcomes is given from the teachers to the students.

Grades of the admitted students to study program is low especially in not state-funded studies. Student admission to SP into full-time, state-funded places considerably decreased from 61 in 2012 (first course in Car Electronics SP) to 34 in 2014. The mobility of students is very low, only 2.4% of all SP students took part in ERASMUS exchange program. It is necessary to develop systematic approach how to control the individual studies of students

Decision-making responsibilities between Dean and Program Committee are clearly allocated and presented. During the on-site visit students, alumni and industrial partners express their satisfaction with this SP.

The different versions of this SP name in Lithuanian and English languages should be clarified. The quality level of SER is not adequate, because of inconsistencies and mistakes. More attention must be taken in writing the next SER. The programme management procedure is well defined but not implemented in practice; it is not sensitive to information coming from outside. The feedback from industry is episodic and participation in SP implementation and quality assurance is week. The teachers of SP are not involved into preparation plans for future of the SP and it seems that such planning is not being carried out at all. The college administration did not present a strategic development plan for the technical faculty. Low financial support from the industrial social partners. The faculty runs two similar SP "Car Electronics" and "Technical Maintenance of Automobiles". It is more difficult to achieve good management results in two SP than in one SP with specializations. There are different opinions from administration and from students about low participation in ERASMUS program.

V. GENERAL ASSESSMENT

The study programme Car Electronics (state code – 653H61003) at Vilnius College of Technologies and Design is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	2
2.	Curriculum design	2
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	2
	Total:	**15**

*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;
2 (satisfactory) - meets the established minimum requirements, needs improvement;
3 (good) - the field develops systematically, has distinctive features;
4 (very good) - the field is exceptionally good.

Grupės vadovas: Team leader:	Prof. dr. Edmund Handschin
Grupės nariai: Team members:	Prof. dr. Tadeusz Skubis
	Prof. dr. Toomas Rang
	Doc. Dr. Dainius Balbonas
	Mr. Rytis Koncevičius

VILNIAUS TECHNOLOGIJŲ IR DIZAINO KOLEGIJOS PIRMOSIOS PAKOPOS STUDIJŲ PROGRAMOS *AUTOMOBILIŲ ELEKTRONIKOS SISTEMOS* (VALSTYBINIS KODAS – 653H61003) 2016-01-08 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-20 IŠRAŠAS

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus technologijų ir dizaino kolegijos studijų programa *Automobilių elektronikos sistemos* (valstybinis kodas – 653H61003) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	2
2.	Programos sandara	2
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	2
	Iš viso:	**15**

* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)
2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)
3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)
4 - Labai gerai (sritis yra išskirtinė)

<...>

IV. SANTRAUKA

SP tikslai ir studijų rezultatai skelbiami viešai. SP taikomi atitinkami studijų metodai, skatinantys intelektinius, komunikacinius ir mokymosi mokytis gebėjimus.

Skiriasi SP pavadinimas anglų ir lietuvių kalbomis. Šios SP tikslas yra per platus ir apima tokią sudėtingą veiklą, kaip projektavimas. Dalis SP tikslo beveik nėra susijusi su numatomais studijų rezultatais ir visiškai nesusijusi su dėstomais dalykais. Skiriasi SS nurodyti SP studijų rezultatai ir SP aprašyme, kuris pateikiamas kolegijos svetainėje, pateikiami studijų rezultatai. Studijų rezultatai nebuvo kuriami pagal jokius tarptautinius standartus. Neaišku, kokie dalykai įgyvendina studijų rezultatus, nes SS ir 1 priede pateikiami skirtingi studijų dalykų pavadinimai. Nedidelė studijų rezultatų dalis iš dalies sutampa su studijų tikslais.

Studijų dalykai paskirstyti tolygiai, jų temos nesikartoja. Apskritai, SP studijų dalykai yra susiję loginiais ryšiais ir išdėstyti iš eilės.

SP pavadinimas neatitinka studijų turinio. Esant pateiktam turiniui, neįmanoma pasiekti numatytų tikslų ir dalies pristatytų studijų rezultatų. Studijų turinyje trūksta svarbių temų, tokių kaip programavimo pagrindai, mikrovaldiklių pagrindai, automobilinės multimedijos sistemos, emisijos ir taršos aspektai, standartai, EMC. Neaišku, kokią pridėtinę vertę studentai gauna iš pasirenkamųjų dalykų, kurie priskirti grupei „specializuotieji studijų dalykai“. Moderniems dalykams trūksta naujesnės literatūros, ypač anglų kalba.

SP dėstančiojo personalo kvalifikacija yra aukšto lygio. Geras dėstytojų pasiskirstymas pagal amžių. Dėstytojai turi galimybę kelti savo kvalifikaciją ir tuo pasinaudoja. Dėstytojai aktyviai dalyvauja įvairioje veikloje, kaip, pavyzdžiui, taikomieji tiriamieji projektai, mokymo projektai (įskaitant techninio mokymo kursus, kuriuos organizuoja Lietuvos ir užsienio automobilių bendrovės) ir tarptautiniai judumo projektai („Erasmus“, „Grundtvig“).

SS skyriuje „Personalas“ pateikiama trumpa studentams skirtų mokslinių darbų ir metodinių knygų analizė. CV analizė rodo, kad personalas (t. y. 39 dėstytojai ir 8 daktarai) vangiai vykdo mokslinę veiklą. Vykdoma mažai taikomųjų tyrimų projektų ne kolegijoje. Neaišku, kokius dalykus dėsto pusė dėstytojų, nes 2 ir 3 prieduose pateikiama skirtinga informacija. Du dėstytojai savo CV nėra įrašę, kad dirba VTDK. 3 priede trūksta kai kurių CV.

Patalpų dydis ir kokybė yra tinkama studijoms. Studijoms naudojamos auditorijos ir laboratorijos atitinka darbo saugos reikalavimus ir higienos normatyvą HN 102:2001. Universiteto ir fakulteto bibliotekos, kompiuterinės laboratorijos ir skaityklos dienos metu dirba pakankamą laiką. Vykdomas palankus bendradarbiavimas su „Toyota Baltic“. Naudojamasi geros kokybės diagnostinėmis laboratorijomis („Toyota“ ir „Bosch“). Vertėtų atnaujinti metodines priemones bei medžiagą ir parengti metodines nuostatas, kaip kiekvieną studijų dalyką pritaikyti „Moodle“ aplinkai.

Diagnostinėje laboratorijoje būtų naudinga įdiegti nesudėtingą diagnostinę įrangą, kuria dažniausiai naudojasi automobilių servisai (neįvardyta paprasta diagnostinė įranga, kuria daugiausiai naudojasi automobilių servisai, įranga daugiausiai paremta „Toyota“). Kolegijos bibliotekoje studentai ir dėstytojai turi prieigą prie keturių prenumeruojamų duomenų bazių. Bet prenumeruojamos duomenų bazės nėra labai naudingos elektronikos studentams.

Priėmimo reikalavimai pagrįsti, aukštojo mokslo įstaiga užtikrina tinkamą akademinės ir socialinės paramos lygį. Studentai gauna aiškią informaciją apie vertinimo kriterijus. SP studentai skatinami dalyvauti taikomųjų tyrimų veikloje, VTDK.hackLAB inovacijų laboratorijoje ir įvairiuose projektuose, pvz., „Sportiniai automobiliai: studentų formulė“. Studentai išreiškė savo pasitenkinimą šia studijų programa. Dėstytojai gerai atsiliepia apie studentų studijų rezultatus.

Į studijų programą priimtų studentų balai yra žemi, ypač ne valstybės finansuojamose studijose. Studentų priėmimas į nuolatines SP valstybės finansuojamas vietas labai sumažėjo nuo 61 studento 2012 m. (pirmas Automobilių elektronikos sistemų SP kursas) iki 34 studentų 2014 m. Studentų judumas labai mažas, tik 2,4 % visų SP studentų dalyvavo „Erasmus“ mainų programoje. Svarbu sukurti sisteminį požiūrį į tai, kaip kontroliuoti individualias studentų studijas.

Sprendimų priėmimo pareigos aiškiai paskirstytos tarp dekano ir programos komiteto, jos aiškiai išdėstytos. Per apsilankymą kolegijoje dalyvavę studentai, buvę studentai ir pramonės partneriai išreiškė savo pasitenkinimą šia studijų programa.

Reikia patikslinti skirtingus šios SP pavadinimus lietuvių ir anglų kalba. SS kokybės lygis nėra tinkamas, nes jame yra nesutapimų ir klaidų. Rašant kitą SS reikia tam skirti daugiau dėmesio. Programos vadybos tvarka aiškiai aprašyta, tačiau nėra įgyvendinama praktiškai, joje neįtraukiama informacija iš išorės. Atsiliepimai iš šios ūkio šakos partnerių yra epizodiniai ir sektoriaus atstovai retai dalyvauja įgyvendinant SP ir užtikrinant jos kokybę. SP dėstytojai nerengia SP ateities planų ir panašu, kad toks planavimas iš viso nevykdomas. Kolegijos administracija nepateikė strateginio Technikos fakulteto plėtros plano. Gaunama mažai finansinės paramos iš sektoriaus socialinių partnerių. Fakultete dėstomos dvi panašios studijų programos: Automobilių elektronikos sistemos ir Automobilių techninis eksploatavimas. Sunkiau pasiekti dviejų studijų programų gerų vadybos rezultatų nei vienos studijų programos su specializacijomis. Administracijos ir studentų nuomonės dėl pasyvaus dalyvavimo „Erasmus“ programoje skiriasi.

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III. REKOMENDACIJOS

1. Tarpusavyje suderinti SP pavadinimą, tikslą, studijų rezultatus bei studijų turinį ir užtikrinti, kad visi SP rezultatai būtų nurodomi atitinkamuose studijų dalykuose.
2. Į studijų turinį įtraukti naujas temas, tokias kaip: programavimo pagrindai, mikrovaldiklių pagrindai, automobilinės multimedijos sistemos, emisijos ir taršos aspektai, EMC ir EUR-ACE ar TUNING-AHELO standartai.
3. Atnaujinti studijų medžiagą tokiems moderniems dalykams kaip: intelektualios eismo valdymo sistemos (turima 9–12 metų senumo literatūra), atsinaujinančios energijos technologijos (turima 8–11 menų senumo literatūra, kuri nėra susijusi su atsinaujinančia energija ir transporto elektronika), robotika (turima 4–10 metų senumo literatūra, kuri susijusi tik su LEGO *MINDSTORMS),* hibridinės ir elektros pavaros automobiliai (turima 6–9 metų senumo literatūra) ir kt.
4. Skelbti daugiau publikacijų tarptautinėse konferencijose ir skatinti mokslinę veiklą.
5. Daugiau bendradarbiauti su bendrovėmis ir įvairiomis institucijomis, iš kurių būtų gaunami nauji aukšto lygio projektai.
6. Kelti personalo anglų kalbos lygį.
7. Sukurti planą, kaip pritraukti talentingesnius mokinius iš vidurinių mokyklų. Didinti studentų motyvaciją.

8. Atitinkama motyvacija didinti studentų judumą. Studentams turi būti aiškūs judumo privalumai, galima pasiūlyti papildomai dėstyti anglų kalbą, studentams reikia siūlyti atitinkamas „Erasmus“ vietas.
9. Realiai įgyvendinti kokybės valdymo sistemą, nes šiuo metu ji veikia tik formaliai dokumentuose.
10. Gerinti bendradarbiavimą tarp pačių mokytojų, taip pat tarp mokytojų ir administracijos, siekiant nustatyti šios SP kryptį ir vystymąsi ateityje.
11. Parengti Technikos fakulteto strateginį plėtros planą.
12. Gerinti informacijos platinimą tarp administracijos ir studentų.

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

Vertėjos rekvizitai (vardas, pavardė, parašas)