STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO TECHNOLOGIJOS UNIVERSITETAS
STUDIJŲ PROGRAMOS
INTELEKTUALIOS ELEKTRONINĖS SISTEMOS
(VALSTYBINIS KODAS – 612H61005, 61201T204)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *INTELLECTUAL ELECTRONIC SYSTEMS*
(STATE CODE – 612H61005, 61201T204)
STUDY PROGRAMME
AT KAUNAS UNIVERSITY OF TECHNOLOGY

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Išvados parengtos anglų kalba
Report language - English

Vilnius
2011

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	Intelektualios elektroninės sistemos
Valstybinis kodas	612H61005, 61201T204
Studijų sritis	technologijos mokslai
Studijų kryptis	elektronikos ir elektros inžinerija
Studijų programos rūšis	universitetinės studijos
Studijų pakopa	pirmoji
Studijų forma (trukmė metais)	nuolatinės (4), ištęstinės (6)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	elektronikos inžinerijos bakalauras
Studijų programos įregistravimo data	1997 m. gegužės 19 d.

INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	Intellectual electronic systems
State code	612H61005, 61201T204
Study area	Technological Sciences
Study field	Electronic and Electric Engineering
Kind of the study programme	university studies
Level of studies	first
Study mode (length in years)	full-time (4), part-time (6)
Scope of the study programme in national credits	240
Degree and (or) professional qualifications awarded	Bachelor of Electronics Engineering
Date of registration of the study programme	19 May, 1997

CONTENTS

I. INTRODUCTION

This assessment report is based on the on Self-Assessment Report 2011 and other self assessment materials provided by the Kaunas University of Technology (KUT) for the Bachelor Study (BA) programme „***Intellectual Electronic Systems***“ and evidence material collected during the on-site visit by experts of the international evaluation team. The responsibility of this study programme is with the Faculty of Telecommunication and Electronics. The remote study of the self-assessment documents was carried out in September/October 2011. The on-site evaluation was performed by the entire evaluation team on November 8, 2011 on the premises of KUT.

Tuesday, 8 November	
Visit at Kaunas University of Technology ***Electronics Engineering (BA programme)*** ***Electronics Engineering (MA programme)***	
09.00 – 09.45	Meeting with faculty administration staff
09.45 – 11.00	Meeting with staff responsible for preparation of SAR
11.00 – 11.15	*Break*
11.15 – 12.45	Meeting with teaching staff
12.45 – 13.45	Meeting with BA students
	Meeting with MA students
13.45 – 14.45	*Lunch*
14.45 – 16.00	Visiting auditoriums, libraries, other facilities (studios, teaching spaces, computer services, etc.)
16.00 – 16.30	Familiarizing with students' course and final papers (thesis), examination material
16.30 – 17.00	Meeting with alumni
17.00 – 17.30	Meeting with employers
17.30 – 17.45	Experts private discussion and finalisation of the visit
Wednesday, 9 November	
Visit at Kaunas University of Technology ***Intellectual electronic systems (BA programme)***	
09.00 – 10.00	Meeting with staff responsible for preparation of SAR
10.00 – 10.15	*Break*
10.15 – 11.15	Meeting with students
11.15 – 11.45	Familiarizing with students' course and final papers (thesis), examination material
11.45 – 12.45	*Lunch*
12.45 – 13.15	Meeting with alumni
13.15 – 13.45	Meeting with employers
13.45 – 14.00	Experts private discussion and finalisation of the visit
14.00 – 14.30	Introduction of general remarks of the visit to the university

All decisions concerning the final evaluation report have been taken unanimously by the entire team.

The following abbreviations are used in this report:

SAR - Self-assessment report

MA - Master

BA - Bachelor

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The *Intellectual Electronic Systems* programme at KUT is composed to prepare first cycle specialists in the field of electronics. The terminology "Intellectual Electronic Systems" is unusual in the international higher education scenario, thus simply Electronics or even "Intelligent Electronic Systems" would cover the topic better. However, this programme partly contains also management related knowledge, which fact could appear in the name of the programme. The graduates should be able to continue studies in the second cycle as well as to work as qualified professionals in the industry. Because of the fast development of Lithuanian industry there is a high demand of specialists in the field of electronics. The employers are mostly satisfied with the BA and MA programmes in the field of electronics, but they prefer a solid knowledge in core subject areas, whereas a too large number of specializations is not of much interest for them. The content is closest to the two similar programmes of Vilnius Gediminas Technical University (electronics engineering) and Avionics.

The programme *Intellectual Electronic Systems* is relatively popular among student applicants. The purpose of the *Intellectual Electronic System* programme is to provide fundamental university level engineering education. The programme is fully compliant with the University mission and development strategy of KUT. The composition of the programme is based on EU directives, the state law and KUT leading documents. The programme coincides with the requirements of Lisbon strategy and Bologna declaration.

The aims of the programme correspond to general requirements of engineering studies: to provide theoretical fundamentals of business, management, humanitarian, social sciences, electronics, information technology, telecommunication systems and equipment along with the necessary subject on electrical engineering, measurement, micro- and nanotechnologies, signals and systems and other more general engineering subjects and to develop practical skills in these fields. The programme aims are relevant to the purpose of the programme: to prepare engineers

to be employed in different fields of the industry and to prepare for university second cycle studies. The aims of the programme are also compliant with the requirements to the BA cycle of the engineering studies. The on-site visit gave the evidence that students are satisfied with the study aims of the programme.

The study outcomes are clearly formulated in four groups: knowledge, intellectual abilities, practical skills and general transferable abilities and skills. The programme outcomes are comparable with similar European programmes and in principle correspond to the programme aims. Complexity level of the learning outcomes corresponds to qualification requirements described in national and EU documents. The outcomes are achievable during the study period (8 semesters).

Learning outcomes of the programme level correspond to the programme requirements. Learning outcomes of the programme are in good correlation with those of the subject level. The links between programme learning outcomes and study subjects are clearly defined by the summary matrix presented in the SAR and are evaluated as consistent in principal. Some general transferable abilities like skills to communicate effectively (D1) or to use legal and standard documents (D2) are present in more subjects, not only in the language study, fundamentals of law or fundamentals of management.

The learning outcomes and programme aims were last updated in 2010, while at this time the number of credits did not change. One year before, in 2009 a restructuring of the programme took place and the number of total credits was reduced from 180 to 160 while the name of the programme was also changed. (The former name was electronic engineering and management, a name easier understandable in an international context.) The name of the programme is misleading or at least not easily understandable. It is not clear for the committee why the name was changed this way, the new name is quite questionable. (Even though the Dean explained on site that this name would attract more students – it does not correspond to the contents of the course.)

From the SAR the programme aims and learning outcomes are clearly understandable and accessible. They are based on reasonable academic requirements and the labour market. They are consistent with the type and level of studies and qualification offer.

Main strengths and weaknesses

Strengths: This is a good and consistent programme which reflects well the present state of the art. This study programme is attractive for the students and secondary school pupils. There is satisfactory interest from the student and the need from the industry. There is a high percentage of students who are interested to continue with a MA program.

Weakness: The actual name of this BA programme should be changed to reflect the content of the study programme. The difference to the present BA programme in electronics engineering is rather small because of this the actual study programme is not yet sufficiently attractive with respect to the module contents. The transition of this study programme creates confusion with respect to its learning outcome.

2. Curriculum design

The study volume of the programme is 4 years for full-time studies and 6 years for part-time studies. The programme volume, 160 national credits, corresponds to 240 ECTS credits. The volume of studies fulfils the minimum requirements to the volume of BA studies according to the Lithuanian law of higher education and average bachelor study volume in EU. The legal requirements for University first level study programmes have changed in June 2010. It has been stated during the onsite visit that the required changes in the programme have been implemented and a new version of programme was elaborated.

The Faculty budget is too small for effective university activities in the wide area of specializations.

Study subjects are in acceptable relation and sequence. The ratio of obligatory, alternative and elective subjects meets the Lithuanian state requirements and allows achievement of learning outcomes. The volume of general university studies is 12 credits that correspond to the minimum requirements 10-12 credits. The core modules of engineering consist of 18 credits while mathematics and physics take another 28 credits. This is all in accordance with regulations. The core modules of the specific study field cover 60 credits, more than one third, while electives (in the last two semesters) cover together 8 credits. This is quite few. The volume of study field subjects and their consistency with the programme's aims are adequate.

The sequence of subjects and internal links between different subjects sufficiently clearly formulated and corresponds to the programme needs. Themes delivered in the subjects satisfy the needs of the BA programme. Modern teaching methods like software based simulators as well as virtual process control environment and learning by doing are used in classes. However some up-to-date topics are completely missing (e.g. computational intelligence).

The study subjects are spread more or less evenly and there is no redundancy. The content of the subjects is consistent with the type and level of the studies and appropriate for the achievement of the intended learning outcomes. The scope of the programme is sufficient to

ensure learning outcomes. One critical remark might be the "missing link" to the related Automation and Control programme of the sister faculty.

There are several courses that do not properly correlate with the main goals of this course. Such are some of the very basic courses (mathematics, Computer Aided Design) that are not specially adapted for the needs of electronic engineers, and also the programming education needs updating and the students should get more opportunity for practical programming.

The present modules do not create the necessary knowledge to follow some of the existing electives e.g. smart distribution grids. Further a lack of connection to the related control engineering programme and a lack of deeper study of the Computational Intelligence field (no core subjects such as fuzzy systems, artificial neural networks, evolutionary computation, etc.). Efforts should be undertaken to change the situation where the programme is not essentially different from the Electronics Engineering sister programme.

Main strengths and weaknesses

Strengths: This is a more or less good and consistent curriculum. The study programme is based on a clear modular description of the learning contents. The programme structure is well designed and consistent with an even spread of subjects. This way the programme design provides a good level of state of the art knowledge.

Weaknesses: The current position regarding the imminent merger of faculties makes it difficult to see the long term policy with respect to future program design. There is little space for electives (both in terms of the number of subjects and available hours). Some of the lectures (such as Mathematics or Computer Aided Design) in the first year are not consistent with an electronics program. The teaching of programming should be reviewed in order to achieve continuity in the study program.

3. Staff

In the *Intellectual Electronic System* programme 47 teachers are involved; all of them are full-time lecturers. Qualification of the teachers (14 full professors, 28 associate professors, 3 lecturers with PhD and 2 other lecturers) corresponds to the needs of the programme. Nevertheless in the study programme structure the list of coordinating lecturers makes the impression as if the percentage of full professors would be less. This might be the result of the age structure (7 over 65 years and another 13 over 51 years out of 47). Specialists of practical

engineering are occasionally invited as lecturers. Specialists of computer engineers and technicians complete the staff.

There has been reasonable turnover of the staff in the past 5 years, mainly because of retirement and new members joining, further by promotion based on obtaining higher degrees and public competition. Lecturers and researchers are appointed to their positions at the University according the procedure defined in the Description of procedure for lecturers and researchers' certification and competition for their position organization. Teachers' research activities, assessed on the basis of the publication list included in CVs, are in correlation with the study programme. In the past years the teachers have published 25 papers annually in the average of which the majority (19) is in the ISI Web of Science. Lecturers and doctoral students of Electronics Engineering research field annually make a number of presentations at international conferences in Lithuania and foreign countries.

However, when surveying the number of publications written by each individual staff member, it was observed that only a subset of the staff is continuously involved in research while others do not have high level (refereed) publications in any acceptable number.

The teaching staff is working in close contact with the industry. Their expertise and organizational activities have a positive impact on the study quality, because many industrial companies have supported university laboratories with industrial equipment and software.

Professional development of the lecturers in teaching, research and practical activities is regulated by the Rules of qualification development approved in KUT (January 2005). The professional development of teachers at different international firms and companies has positive influence on the study quality and cooperation between university and industry. The study process is supported by real industrial experience, equipment and software.
Members of the staff have attended conferences in Sweden, Finland, Czech, Belgium, Iceland, Bulgaria, Germany, Estonia, Greece, Latvia, Spain, Portugal, Slovakia and Denmark.

The main problem is that the available budget covers only minimum salary requirements for teaching staff but it is insufficient for adequate mobility and research activities. Urgent need for research funding exists and more activities for research project applications are needed.

Main strengths and weaknesses

Strengths: The staff is highly qualified with relatively intensive publication activities and good international mobility, further it is focused on the students. The teaching staff is sent to foreign training centres; however these activities started rather late. There is a clear policy for appointing new members of staff and the retiring procedure is clear.

Weaknesses: The staff has an inconvenient age structure. There are very few foreign visitors coming to this faculty. Research activities are very unequally distributed amoung the teaching staff. The staff training activities are not sufficient.

4. Facilities and learning resources

KUT has sufficient number of premises: classrooms in compliance with hygiene and work safety norms and equipped with modern audio and video appliances and laboratories. The study process is organized according to the classroom occupancy norms, lectures – 100, practical training lessons – 25, laboratory works – 12 students. Good conditions for individual studies of the students are created at the University Central and Faculty libraries that have sufficient working places. The literature in the libraries is sufficient for first cycle studies in the field of Intellectual Electronic Systems.

The laboratory equipment is suitable and sufficient for studies at a basic level. Laboratories are equipped with reasonably modern technological devices and software from well known industrial companies. Programmes of Texas Instruments Inc. (2004, renewed in 2010) are used. The current technical state of computer classrooms the sufficiency of computer hardware and software ensures the necessary effectiveness information technologies studies. The hardware and software used for the programme conducting is up to date and legal. With the purpose of administration convenience all computers are connected to internal network, which has connection to high speed LITNET network and internet. In general it should be remarked that the laboratory equipment is sufficient but very minimal and clearly underfunded. It is a positive element that motivated students may have access to hobby laboratories where they complete interesting „mini-research“ projects under guidance of the staff.

The practical training resources are suitable and accessible for students and are in compliance with the aims of the studies. The places of practice proposed by the departments are announced for students together with the recommendations to take individual initiative to search for the place of practice. For the formal start of practice, individual trilateral contracts are always signed between the University, the enterprise and the student.

The funds (resources) of the university library are accumulated according to the study programmes, branches and research fields. The most important methodical materials and books for the study programme have been written by faculty lecturers and are available in the Lithuanian language. All the printed matters are accumulated in open funds. Most of the periodical publications are available in electronic form. According to the SAR the major part of

the fund consists of literature in the field of engineering and technology - 69 %, mathematics and physical sciences 15 %, social sciences - 9 %. The number of publications corresponds to the study programme aims and learning outcomes (textbooks, books, scientific journal, etc.). The number of provided books and periodic publications is sufficient to conduct successfully this BA programme.

Learning materials, incl. methodological publications, are suitable and accessible for students. Students can use the methodological material: slides, lecture notes, methodological guides etc. The access to methodological materials is ensured by providing printed publications, via e-mail or Internet. Students and teachers are using the common e-mail address to which the lecturer of a study module places the necessary information for students, individual tasks, and other methodological information. This enables the student to get individual consultations via e-mail. Some methodological means (special mathematical modelling software) is worked out by faculty lecturers.

The premises for studies are adequate, the laboratory and computer equipment are sufficient, proper arrangements for students' practice are available and the text books, periodicals and databases are proper and accessible. Despite this statement in general the available equipment is meagre and basic.

Main strengths and weaknesses

Strength: Relatively good facilities equipment and teaching materials support the study procedure. The access to development and hobby laboratories is to be applauded. The use of project work through most of the programme engages the students with the subject and creates creativity.

Weakness: Despite the relatively high level of laboratory equipment (compared to some other Lithuanian Universities, this equipment could be further improved in quality by achieving more up-to-date instruments and devices, e.g. by obtaining EU and industrial grants. The laboratory facilities are at present underfunded.

5. Study process and student assessment

Admission to the first cycle of the study programme conducted at the Faculty of *Telecommunication and Electronics* is realized according to general statements of the Rules of admission to the first cycle studies at Lithuanian Higher Education Institutions. The quite wide

range of the applicants' competition grades shows that this program is chosen by students with different basic levels of competence. Therefore, a high amount of students do not complete the studies and the dropout rate is high. There are no special requirements for the basic students' knowledge level of the applicants that could be rational in the case of relatively low competition rate for the admission of first cycle students. In the case of higher competition rate the special requirements could be rational.

The coordinator of the programme – the Department of Electronics Engineering takes part in the activities as the coordinator of admission process – the Admission Office of Academic Department of the University is providing the prepared advance promotion (advertisement) materials (leaflets, videos and other) for presentation of the programme at the annually organized LAMA BPO fair of higher schools "where to study" at Kaunas and one of the biggest exhibitions in the Baltic States „Learning, studies, career" at Vilnius. In 2010 at the Faculty of Telecommunications and Electronics a group of representative teachers was formed (including teachers form the Department of Electronics Engineering), which present academic and scientific activities of the faculty to secondary school students, show them the equipment at the laboratories and allow them to conduct their "first laboratory experiments". Lecturers of the department who participate in open days motivate the future students, introduce facilities of studies and research, provide information, advice, and consult what knowledge and abilities are necessary to study in this programme.

The programme schedule is organized in a rational way. The studies are organized in the autumn and spring semesters of 16 week duration according to the academic calendar placed in the university web site and printed publication of study programmes and in agreement with individual study plans and schedules. The morning hours are reserved for the theoretical lectures. The lectures are organized in such away that after two hours of theoretical lectures there is the workshop (practice, seminars or other) or break (lunch time). The schedule of the new semester is prepared in the middle of the current semester. First of all the theoretical lectures are planned and then the workshops. The semester schedule, which is approved by the dean and lecturers, is published on the information board and at the Internet site at the Faculty no later than one week before the beginning of the semester. The schedule can be corrected in accordance with the students' needs during a week until the beginning of the semester. The exam schedule is approved by the dean and it is published two weeks before the exam session. The exam schedule is prepared 1.5 months before the end of the semester.

Two stages of student turnover can be distinguished in the period of assessment: 2006-2008 and 2009-2010. In the recent period a downward trend of accepted student numbers is noticed. After analysis of the students accepted in 2006-2008 and choosing a study programme

after two years, a dropout rate of respectively 40 %, 30 % and 12 % was noticed, which happens in the first year of studies, especially in the first semester. Seeking to reduce the dropout the KUT Academic Advancement Centre was established by the resolution of the Senate where students can reduce their lack of knowledge in mathematics, physics, and chemistry, which appears due to constant education reforms. The faculty of Telecommunications and Electronics was the only one where the so called System of "0, 1, 2" (where 0 – bad, 1 – satisfactory, 2 – good) for advancement evaluation was conducted. This system together with the feedback and administrative measures (reduction of scholarship, warnings and etc.) motivated students to study constantly in the semester period and reduced the dropout. From 2010/2011 sheets of semester evaluations are introduced at KUT, which allow controlling and ensuring on time fulfilment of semester tasks. In comparison, the dropout rate of the students in 3-5 semesters, when the study programme analysed is already chosen is up to 5%. They have a higher motivation and are more interested in the final results of the study programme.

The increase of the number of student publications in research periodicals shows a similar tendency of increase of the number of students taking part in research activities during the period under assessment – the fact can be considered as an indicator of the student's growing interrest to implement the acquired knowledge in practical activities and motivation to seek for deepening knowledge at the 2nd cycle studies. The number of student publications presented in the period 2008-2011 was 21, 26, 24 and 26 per year.

The Faculty of Telecommunications and Electronics has bilateral agreements with a several foreign universities. According to these agreements each semester 1-2 students can be sent for 5-6 months. In the period of assessment 12 students left to Bulgaria, Denmark, Great Britain, Spain and Iceland. For partial studies to the core division of the programme only 3 foreign students arrived (from Spain and Korea).

Academic and other support for first cycle studies students is continuously delivered. Regular spread of updated actual information about study modes, branches, financing, programme aims and learning outcomes, evaluation of achievements, elective modules, schedules, and possibilities in mobility is ensured by regular updating of the university website, faculty website and websites of the departments.

The possibilities for students to repeat study modules and to retake exams are defined in the Rules of study module results evaluation. For the first time and up to the beginning of a new semester the students do not have to pay for a repeated exam, for the second attempt to retake an exam a determined fee should be paid. If the number of failed subjects equalized to credits after the end of repeating and prolonged terms remains less than half of the total credits included into the semester programme, the student can be registered for the higher semester with additional

inclusion of the repeated study modules into his/her individual study plan of the new semester. The repeated study modules are included into the plan of the nearest semester at which these modules are conducted if it is possible from the point of view of prerequisites.

KUT has sports, health and cultural support facilities. From the University scholarship fund appointed to the Faculty by the Dean's order and with agreement of the Student Union, state-financed students and those who have no academic failures, motivating scholarships for perfect results in studies and research are granted. Besides motivating scholarships, social and sponsors scholarships are also offered. The students who are granted social scholarships have the possibility to be granted regular or one time motivating scholarship and sponsor scholarship as well. The need of dormitories for students of the programme is satisfied.

For students' achievement assessment a ten grade criterion scale and cumulative motivating scheme through the whole semester is applied. The learning outcomes of each study subject in the study programme have been relevantly assessed. The assessment grade is the composition of homework, laboratory works, tests and exam grades. The assessment criteria are public.

Students are provided with the feedback on their achievements by familiarizing them within the assessment results of self-education tasks, written exams together with oral comments by the lecturers. The feedback on student achievements is effective, because it helps students to understand better how they learn the subject and how they can gain their experience and competence. The feedback from students to programme managers is confidential via an Internet web site. However, students will not see the result of their own assessments.

Final theses are defended at the meeting of the electronic engineering study field qualification committee. The qualification committee for awarding bachelor qualification degree in Electronic Engineering consists of 7 members, researchers with competence in the study field or professionals of practical activities and employers' representatives. Before public defence the thesis is presented to the head of Department of Electronic Engineering. The supervisor and reviewer of the thesis write their review letters with the assessment grade proposals. A seminar for preliminary assessment of the presented thesis is organised. Members of the qualification committee make assessment of the theme of final degree project and the applied methods, of the reliability of obtained results, actuality and originality, meeting of the requirements formulated in the task, material presentation quality (clearness) and consistency, relation to the known works, evidence and clearness of conclusions, oral presentation quality, skills to justify the drawn conclusions and to answer the presented questions in a proper manner.

According to the SAR the students´ motivation and their interests in the study field are the main factors that stimulate them to think beyond the study programme and autonomously gain knowledge and practical skills. There is no formal self-education assessment system.

According to the results of assessment period graduate survey 91% of programme graduates were employed according to their specific degree and the major part (68%) is working at companies in the electronics field. The number of state financed Master study programme vacancies is sufficient to continue studying in second cycle studies. In 2006–2008 178 graduates graduated from bachelor studies, 46% of them chose Master studies in Electronics Engineering, and further 6% of them chose Master studies in other fields.

Main strengths and weaknesses

Strengths: Students have a good and close contact to the teaching staff so this specialization uses a good system of supporting students with study problems. Especially here are good mechanisms in place to assist students experiencing difficulties in the first year The alumni and employers appreciate the combination of engineering and management that is contained in the program very much, thus graduates have a good job and further study opportunities. The students receive clear information regarding the assessment criteria and clear feedback of that assessment. Finally, the teaching staffs are supportive in assisting in seeking appropriate employment

Weakness: The decreasing number of applying students is a great problem. The internationalisation strategy with respect to teaching is not clear e.g. there is little motivation amongst the students to participate in Erasmus programme. Thus the exposure to external lectures and mobility is little.

6. Programme management

The programme management is carried out by a *Study Programme Committee* in accordance with the Statute of KUT. The study programme management and the quality assurance are supervised by the vice-rector for studies with the help of Studies Office and Studies Quality and Monitoring Office of the Academic Department. The *Study Programme Committee* cooperates with the departments and their coordinators of the programme. When the rational proposals on the study programme or the study subject contest are received from the students, lecturers or employers, these proposals are assessed in a department session and if necessary, changes are made by the programme committee. The established programme management activities at KUT can be considered to be consistent and effective. Nevertheless, it

is remarked that the committee has not found any sign of coordination in the curriculum development with related programmes of the same university (e.g. at other faculties) or at other institutions (where similar programmes exist).

According to the SAR, regular quality assessment of the programme is carried out in compliance with the system of internal quality assurance of studies approved by the decision of the senate. Activities of the quality evaluation system are carried out in compliance with the approved normative documents. Periodicity of the internal quality assurance of studies is based on the problematic results in quality assurance. According to the information about the study programme assessment, the coordinators of the programme are taking measures for the elimination of identified shortcomings. Evaluation parameters, methods and aids are prepared by different groups of university members. The evaluation process is public. Participants are the administration, staff members, students, employers and other stakeholders. Students, teachers and stakeholders are involved in the study programme quality evaluation and improvement. At the end of each semester the Study Programme Committee, the Faculty Council and students are seeking for feedback and evaluating the programme study subjects and their teaching quality. For this purpose an electronic questionnaire is used in the university web site. Results of the questionnaires are discussed at the meetings of the dean's office and departments. Summarized statistics of the questionnaires are made public. The department lecturers of the study programme are participating in the programme assessment and quality enhancement activities at the department meetings.

Continuous quality assessment of the programme is carried out in compliance with the System of internal quality assurance of studies approved by the senate. The structure of the programme is annually revised and renewed marginally in the frame of the university preparation for the next academic year schedule worked out by academic department in supervision of vice-rector. Study modules are renewed by the lecturers and divisions on compulsory basis every three years. At the end of each semester The Study Programme Committee, the Faculty Council and the students in the senate acting according the determined in the University order and seeking for feedback have the possibility to asses study modules' programmes and their teaching quality. For the purpose an electronic questionnaire is placed in the academic information system of the university web site.

Students give their opinions based on a questionnaire system and the teachers may access of these results. Several industrial partners also contribute to the quality assurance of the programme. However the university does not make the students aware of the results of the questionnaire. The industrial knowledge and experience for improving the study programmes is not fully used.

Main strengths and weaknesses

Strengths: This study programme is under continuous review and updating, thus it is well-adapted to the needs of industrial research. Well structured assessment and quality assurance system, student feedback, industrial input.

Weakness: There is a lack of coordination with other programmes with similar contents or even identical degree qualification. The students do not get any feedback of their own teacher assessment.

III. RECOMMENDATIONS

3.1. Change the name of the programme so that it reflects the real contents.
3.2. Either merge the programme with its closest neighbour or make it sufficiently different.
3.3. After the imminent merger of faculties it would be reasonable to re-design the curriculum.
3.4. Include more electives, more modern core subjects.
3.5. Apply for more grants (EU, industrial), obtain much more funds for renewing equipment.
3.6. Consider other related programmes with similar contents in the curriculum design.

IV. GENERAL ASSESSMENT

The study programme *Intellectual electronic systems* (state code – 612H61005, 61201T204) is given **positive** evaluation.

Study programme assessment in points by fields of assessment.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	2
3.	Staff	3
4.	Material resources	2
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	3
	Total:	**16**

*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.

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