



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO KOLEGIJOS
AUTOMATINIO VALDYMO PROGRAMOS (653H62007)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF AUTOMATIC CONTROL (653H62007)
STUDY PROGRAMME
At KAUNAS COLLEGE

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Išvados parengtos anglų kalba
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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Automatinis valdymas</i>
Valstybinis kodas	653H62007
Studijų sritis	Technologijos mokslai
Studijų kryptis	Elektronikos ir elektros inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3), iššęstinė (4)
Studijų programos apimtis kreditais	180 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Elektronikos ir elektros inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	2009-08-31 Nr. 1-73

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Automatic control</i>
State code	653H62007
Study area	Technology science
Study field	Electronics and electrical engineering
Kind of the study programme	College studies
Cycle of studies	First
Study mode (length in years)	Full-time (3), part-time (4)
Scope of the study programme in credits	180 ECTS
Degree and (or) professional qualifications awarded	Professional Bachelor of Electronics and Electrical engineering
Date of registration of the study programme	2009-08-31 Nr. 1-73

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I. INTRODUCTION

Kaunas College (KK) conducts the Automatic Control Study Programme (AESP). This programme awards Professional Bachelor degree through full time and part time studies. The programme is conducted at the Department of Computer Technologies (DCT). The field of studies is Electronics and Electrical Engineering in the area of Technical Science. The programme aims at training people mostly able to design, install, and operate automatic control and automatic monitoring systems. The Institute of Labour and Social Research studied the needs in the field of automatic control engineering until year 2013, through an inquiry in 20 companies: there is a clear lack of professionals at least at the professional bachelor level. The graduates are also concerned by mechatronics and services: the curriculum was revised in consequence. The programme registered in year 2000, has been renewed and restructured in 2011 with a new study credit system based on ECTS and the two former specializations were merged into one deeper specialization. The social partners took their place in the process of renewal of the learning outcomes and of the programmes. The DCT continuously takes in account the labour market demand.

KK has two faculties and two divisions; in 2005 KK was accredited as a higher education institution. In 2007 KK was authorized to award professional bachelor degree. The programme AESP was fully accredited in December 2003. The Faculty of Technology (1600 students) is concerned with this programme; it implements nine study programmes, AESP is one of them. At KK there is a strategic plan for the future activities of KK and activity plans for faculties department and teachers.

This study programme has been previously externally evaluated in 2003. In 2003 the experts identified main benefits of the AESP and the aspects that should be improved:

- Insufficient number of teachers with the necessary skills of practical works
- Insufficient consciousness of the entrants regarding the future profession
- Necessity to improve the knowledge assessment system and self study control
- Students are insufficiently trained for teamwork

An activity plan for AESP improvement based on these recommendations has been realised for 2004-2007.

The self evaluation report (SER) has been elaborated from October 2011 to June 2012 by a workgroup conducted by D. Luksaite. The remote distance study of SER has been conducted in September 2012. The SER is well written, strengths and weaknesses are described at the end of each section, but part time education only began in 2011, and hence few indications

are given in the report on part time study programme organisation which concerns few people because of the possibility of individualisation of full time studies.

The visit on-site took place on October 4th 2012 according to the following schedule:

- | | |
|----------------|--|
| 9h-9h 45 | Meeting with Administrative staff |
| 9h 45-10h 30 | Meeting with staff responsible for preparation of SER |
| 10h 45 -11h 30 | Meeting with teaching staff |
| 11h 30 -12h 15 | Observation of various support services |
| 14h-14h 45 | Familiarization with students final works, examination material. |
| 14h 45-15h 30 | Meeting with graduates and social partners, employers |
| 16h-16h15 | Introduction of general remarks of the visit |

The following evaluation report represents the unanimous opinion of the entire team.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The programme aims and learning outcomes are well defined, clearly described and publicly accessible. They are based on the academic and/or professional requirements, public needs and the needs of the labour market: the Institute of Labour and Social Research carried out a study that showed that nearly half the companies pointed out that there is a lack of qualified professionals in these fields. They are actual and appropriate because the region of Kaunas needs graduates in the field of automatic control engineering. Considerable improvements have been realized concerning robotics. The programme aims and learning outcomes are consistent with the type and level of studies and the level of qualifications offered especially in automatic control where the students will have to operate different kind of devices. But as all professional bachelors' programmes of the country the life of the programme is very dependant of the level and motivation of secondary school students in scientific fields

The experts found that the name of the programme, its learning outcomes, content and the qualifications offered are compatible with each other; it was confirmed during the discussions with employers.

2. Curriculum design

AESP meets the legal requirements and concerning the time devoted for graduation paper is over the minimum requirements. The detailed description of the study programme is very well presented and attractive; the options (specializations) are convenient. Practices represent 16.8% of the subject group of the study field, practical and laboratory work – 26%. In total, the study programme allocates 42.8% of the whole duration for the practical training. Study subjects and/or modules are spread evenly in a logic sequence. Their themes are not repetitive thanks to a continuous dialogue between teachers to avoid redundancies: the teachers in the college have many occasions and meetings to discuss about students and studies. The content of the subjects and/or modules is consistent with the type and level of the studies, however the first year topics should be more related to engineering problems and to future professional activities because this could reduce drop out by reducing demotivation. The general subjects in the first year are taught by other departments so it is difficult to have them specific, but an effort should be made in this sense. In mathematics, for example, some discussion took place with the electronic teachers to evolve in this direction. A similar activity should evolve also in the field of physics to make those teachings more in link with electrical engineering. The study programme

also urgently needs new modules concerning renewable energy systems in particular wind and solar energy conversion systems together with the corresponding control aspects

The content and methods of the subjects/modules are appropriate for the achievement of the intended learning outcomes; in numeric technologies, the study programme is particularly up to date, when necessary the college use the fitted devices through partnerships with other institutions for example Kaunas Technical University. The scope of the programme is sufficient to ensure learning outcomes: the content of the programme reflects the latest achievements in science and technologies. Aspects of sustainability are covered in different lectures e.g. energy, building, philosophy. The teachers want to emphasize the link between science and society. However intellectual property should be introduced in the lecture on applied research. The repartition of the different kinds of works is carefully studied. However, graduates and employers note a lack of practical training and experience in this professional bachelor study programme. Apart from this point, students, graduates, and employers are satisfied with this study programme. The interest of some companies concerning specific practical skills quoted by employers met during the on-site visit are related to:

More important programming abilities

Electrical part of the control system

Mechatronics.

The improvement of graduation paper assessment criteria is done each year and communicated to students. However, the text quality of several final thesis studied during the on-site visit is sometimes rather low. The final works, even if they are realized inside the college have a close link with enterprises preoccupation which is good for students of professional bachelor.

3. Teaching staff

Academic staff working within AESP meets the requirements laid down by the legislation. 16.3 % of the study field subject volume is taught by the teachers who hold a doctoral degree (requirement at 10%) which is a good thing in a field of permanent evolution of subjects. All the teachers possess practical work experience in the area of the subject taught, and an experience of pedagogic activity. Staff is well motivated for education and adequately qualified for specialized courses. KK has a strong partnership with Kaunas University of Technology; hence the teachers are not isolated from the scientific point of view. The teachers use active learning and e-learning methods to solve the difficulties encountered by the students especially for basic subjects (mathematics, physics). Moreover there is a good relation between students and teachers: individual teaching and tuition is offered for the students that don't have

sufficient knowledge. There is a culture of staff development that can be implemented around projects in the faculty. The teachers try to increase their qualifications through seminars or exchanges of good practice they are very much concerned with research on pedagogic methods: these seminars concern not only the teachers of the program but the teachers of the faculty and teachers of basic subjects and specific one are concerned. The teaching methods are oriented to teamwork, and small projects are sometimes given in mechatronics and robotics to increase the study success of students. Concerning applied research of teachers, 13 of the publications of the 47 realized are in the journals cited in databases, they concern mainly energy. The staff indicated that the college itself organizes its own conference on energy. However the teaching staff has only limited contact to industry as far as consulting activities are concerned. 21.7% of the teachers have participated in international projects; two teachers have experience of international cooperation in the field of scientific research, five in the study field. AESP has nine cooperation agreements with foreign education institutions (Austria, Belgium, Turkey, Estonia, Portugal, Latvia, Bulgaria, Germany Poland) a part of the programme “Control engineering” of 90 credits, intended to welcome students in mobility, is taught in English. Nine teachers teach in English. There are only 10% of out coming teachers. The exchange programme possibilities should be more used. Three European projects about engineering education have been granted and four teachers participated to expert activities in education. When looking at the CV of teachers, it is noted that they all come from Kaunas University of Technology; more diversity in the origins of teachers should be good for the College.

4. Facilities and learning resources

The program has many software and hardware facilities dedicated to automation that are changed every four years as précised in the SER, because it is a field where obsolescence is great. In the case where equipment does not exist in the college students can discover it in companies (especially during internships) or in Kaunas University of Technology which is a good thing. Laboratories are constantly under improvement except the actual physics laboratory which is not adequate at all because the physic demonstrated there is very basic and not linked with engineering. The transfer in the new building is supposed to improve the physics laboratory as was explained to us during the visit, when we made remarks on the bad level of physics laboratory.

Computer classroom is used even out of the working week thanks to flexible opening time, for example on evening for those who have a job while studying. 80% of AESP study subjects are adapted for e-learning. E-Learning is a real strength of AESP. The groups for lecture and seminars are small (16-27 students) that make them more interesting for students. There is a

very good equipment for Centre of distance studies (EU project), students use Moodle. Students and teachers can use six subscribed databases: Ebsco publishing, Oxford Reference on line, Taylor and Francis, Grove Music Online, Taylor&Francis, and Emerald Management.

5. Study process and students' performance assessment

The selectivity, that is the number of competition points for incoming students, increased from 2007 to 2011, but not for part time studies. Attractivity depends on the number of funded places to study although this programme is popular amongst students. Mathematics and physics are the difficult subjects of this study programme for students because of the low level of knowledge gained in the secondary schools in this field. A test on the level in English language is realized at the arrival of new students and specific consulting given in case of low level.

In the college, 301 scholarships were awarded during the years 2007-2011, 43 had scholarship for achievements in social activities. Mobility grants are awarded, however, very few students on the observed period of 5 years were studying abroad. According SER for 2007-2008 six students went abroad and since 2009 to 2012 only two students). This is mainly because they feel well at home or because they are not enough confident in their own level of English language. A student scientific-practical conference is organized each year to present the students work. Students also participate in robotic challenges in the frame of Baltic countries; a day of computer games and robot competition is organized by the college. Students of this program have the possibility to participate to the activities of KK students, which is a good thing for the intercultural mix because there are very different programs in the college. Each academic group of the first year has his own teacher tutor who follows groups progresses and difficulties. Open lectures are organized where lecturers from abroad and employers give conferences. Each year, students evaluate the organization of practices and practice supervisors evaluate theoretical and practical training of the student. Most of the students (81%) find a practice place individually, this practice is a good opportunity to find a job in the enterprise. As discussed with alumni and staff, some of the graduates undertake master's studies after 2 or 3 years of job in enterprises.

Student association has organized special events devoted to elimination of academic dishonesty. 32% of the students continue their study in the electrical engineering field in Master degree or other diploma. Starting in 2012 each student signs a contract concerning plagiarism. The students are encouraged and helped to participate to students competitions. It is easy to find a job but some people prefer to work abroad to earn more money, because in Lithuania in these fields job begin at a low level worker with small salary.

Remarks of our expert student

International mobility of the students and teachers should be improved in the future. Students mentioned that they do not feel strong with their knowledge of English language, but administrative staff claimed that the number of English language credits was increased and hence the situation should change. Those students who participated in the Erasmus programme should come and tell their experience to perspective student members of this international mobility programme. Knowledge of newly admitted students is very different according to competitive points but teachers are giving them additional lectures and putting in a lot of effort to fill these knowledge gaps of weak students. It was said that students mainly drop out during or after the first year of studies because of mathematics, physics and other general subjects, so they should be more electrical and automation oriented that students could feel a correlation between their studying study programme and these general subjects and that should increase their motivation to study. Moreover, sustainable development topic is also involved in subjects materials which is really important for automation specialists. Students are satisfied with administrative staff and teachers, that they can get help when their need it and their requests are not rejected. Also, students are happy about the activity of students union and they can apply to it when needed. Assessment systems seem to be well organized, because students did not have any complains about it either.

6. Programme management

The study quality monitoring programme is rather informally defined that is to say that from an administrative point of view there are not many instances and meetings, which should be taken into account and changed. However, it has good results. It is a pity that there is no global enquiry to know the situation of the employment of graduates, that should be done in the future. However employers have many discussions with teachers about subjects and practices. During on-site visit we saw that there are many informal contacts between the staff and enterprises. Each semester after assessments have been given back, the students make an evaluation of teaching quality on paper; they are free to do so. This evaluation is followed by meetings with teachers to define which improvements must be implemented to remedy the problems pinpointed in the evaluation. The evaluation system "Evaluation of graduation papers" is open to members of companies and very well structured in terms of quality management. Each year teachers make an individual activity report concerning all their activities: teaching, research, link with enterprise, projects. Recommendations of the previous evaluation were taken into account through evolution of programmes, increase of e-learning and improvement of the qualifications of the teachers.

III. RECOMMENDATIONS

1. Improve formalism of quality assurance system
2. Make stronger efforts for mobility of student
3. Buy more devices for practical working places in physics laboratory
4. Try to recruit teachers of more different origins
5. Encourage teachers to work with industry
6. Try to specialize first year's general subjects towards engineering matters
7. Increase the level of redaction of final thesis
8. Increase practical works in this professional bachelor programme
9. Realize periodic enquiries to know where the alumni work, what is their job and how much they are paid

IV. SUMMARY

The study program in automation engineering is a significant contribution to the growing need for practical engineers in the domains of industry and services. We observed that learning outcomes were actual and appropriate, and that in numeric technologies the study programme was particularly up-to-date. Aspects of sustainability, which are very important in this field of study, are covered in different lectures

Discussing with staff and students we understood that teachers were well motivated for education and adequately qualified for specialized courses. They offer individual teaching and tuition to weak students, we also noticed that there exist good relation between students and teachers. The strong partnership with Kaunas University of Technology, brings opportunities to use modern devices to students, and for teachers to have common work or discussions with their colleagues of university. The laboratories are constantly under improvement (the actual physics laboratory is not adequate at all, but hopefully improvement will be realized in the new building).

The study quality monitoring programme is rather informally defined but has good results and students, graduates and employers are satisfied with this study programme. First year topics are not sufficiently related to engineering problems and to future professional activities, improvement in this direction should go on. There is still also a lack of practical training and practical experience in this study programme, and this was pointed out by graduates and employers.

The teaching staff has only limited contact to industry as far as consulting activities are concerned, the contacts concern much more organization of practices. There is a great lack of internationalization of students and partially for teaching staff because the exchange programmes are not adequately used, the desire of all of them to go abroad should be developed. Also, the text quality of some final thesis is too low, it should be increased because engineers need to have good communication skills.

V. GENERAL ASSESSMENT

The study programme *Automatic control* (state code – 653H62007) of Kaunas College is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	4
2.	Curriculum design	3
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	3
	Total:	19

*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:

Edmund Handschin

Grupės nariai:

Team members:

Anne Marie Jolly Desodt

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V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno kolegijos studijų programa *Automatinis valdymas*. (valstybinis kodas – 653H62007) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	4
2.	Programos sandara	3
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	19

* 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

Automatinės inžinerijos studijų programa labai atsižvelgiama į didėjantį inžinierių praktikų poreikį pramonės ir paslaugų srityje. Matyti, kad studijų rezultatai aktualūs ir tinkami, taip pat, kad programa labai aktuali skaitmeninių technologijų atžvilgiu. Šiai studijų kryptčiai labai svarbūs tvarios plėtros aspektai aptariami per įvairias paskaitas.

Kalbėdamiesi su darbuotojais ir studentais sužinojome, kad dėstytojai gerai motyvuoti dėstyti ir turi specializuotiems kursams tinkamą kvalifikaciją. Jie siūlo individualų mokymą silpniems studentams, taip pat pastebėjome gerus studentų ir dėstytojų santykius. Glaudžiai bendradarbiaujant su Kauno technologijos universitetu studentams suteikiama galimybė naudotis

šiuolaikiškais prietaisais, o dėstytojams – bendradarbiauti ir diskutuoti su šiame universitete dirbančiais kolegomis. Laboratorijos nuolat gerinamos (dabartinė fizikos laboratorija visiškai netinkama, bet tikimasi, kad naujajame pastate ji bus geresnė).

Studijų kokybės stebėsenos programa apibrėžta palyginti neformaliai, bet jos rezultatai geri; studentai, absolventai ir darbuotojai šia studijų programa patenkinti. Pirmųjų metų temos nepakankamai susijusios su inžinerijos problemomis ir būsima profesine veikla – šią sąsają reikėtų gerinti. Kaip nurodė absolventai ir darbdaviai, šiai studijų programai taip pat vis dar trūksta praktinio mokymo ir praktinės patirties.

Dėstytojų ir pramonės atstovų bendravimas konsultacinės veiklos klausimais tik labai ribotas; daug daugiau bendraujama studentų praktikos rengimo klausimais. Labai nedaug studentų ir palyginti nedaug dėstytojų išvyksta studijuoti arba dėstyti į kitas šalis, nes nepakankamai naudojamasi mainų programomis, todėl studentus ir dėstytojus reikėtų skatinti kuriam laikui išvykti į užsienį. Be to, nepakankamai gera kai kurių baigiamųjų darbų teksto kokybė; ją reikėtų gerinti, nes inžinieriams svarbu turėti gerus komunikacijos gebėjimus.

III. REKOMENDACIJOS

1. Didinti kokybės užtikrinimo sistemos formalumą
2. Stengtis užtikrinti didesnę studentų judumą
3. Nupirkti daugiau prietaisų fizikos laboratorijos praktinėms darbo vietoms.
4. Stengtis įdarbinti dėstytojus, baigusius įvairesnes aukštojo mokslo įstaigas.
5. Skatinti dėstytojus bendradarbiauti su pramonės atstovais.
6. Stengtis dėstant pirmųjų metų bendruosius dalykus juos pritaikyti prie inžinerijos dalykų.
7. Gerinti redakcinę baigiamųjų darbų kokybę.
8. Į šią profesinio bakalauro programą įtraukti daugiau praktinių darbų.
9. Reguliariai vykdyti apklausas siekiant sužinoti absolventų darbo vietą, pobūdį ir užmokestį

<...>