



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO TECHNOLOGIJOS UNIVERSITETO
ELEKTROS ENERGETIKOS TECHNOLOGIJOS PRO-
GRAMOS (61201T103 (612H63001))

VERTINIMO IŠVADOS

EVALUATION REPORT
OF ELECTRIC POWER ENGINEERING TECHNOLOGIES
(61201T103 (612H63001)) STUDY PROGRAMME
AT KAUNAS UNIVERSITY OF TECHNOLOGY

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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Elektros energetikos technologijos</i>
Valstybinis kodas	61201T103 (612H63001)
Studijų sritis	technologiniai mokslai
Studijų kryptis	elektros inžinerija
Studijų programos rūšis	universitetinės studijos
Studijų pakopa	pirmoji
Studijų forma (trukmė metais)	nuolatinė (4), iššęstinė (6)
Studijų programos apimtis kreditais ¹	160
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	elektros inžinerijos bakalauras
Studijų programos įregistravimo data	1997 m. gegužės 19 d.

¹ – vienas kreditas laikomas lygiu 40 studento darbo valandų

INFORMATION ON EVALUATED STUDY PROGRAMME

Name of the study programme	<i>Electric power engineering technologies</i>
State code	61201T103 (612H63001)
Study area	technological science
Study field	electrical 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 ¹	160
Degree and (or) professional qualifications awarded	Bachelor of Electrical Engineering
Date of registration of the study programme	19 May 1997

¹ – one credit is equal to 40 hours of student work

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Centre for Quality Assessment in Higher Education

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I. INTRODUCTION

This evaluation report is based on the material on self-assessing 2010 provided by the Kaunas University of Technology (KUT) for the bachelor study programme “Electric Power Engineering Technologies” and the onsite visit. The responsibility of the study programme is with the Department of Electrical Power Systems within the Faculty of Electrical and Control Engineering. This department is dominant in the faculty when considering contract incomes. The bachelor programme in electric power engineering technologies was accredited in 2001 without conditions. The same faculty also offers the bachelor programmes “Electrical Engineering” and “Automation and Control”. There are about 17.000 students and 3.000 employees at KUT but only some 100 researchers. Typically the share of researchers is much higher in science universities. A huge amount of rules are referred in the self-evaluation report. Individual courses are described in a very detailed way as it is the rule in Lithuanian evaluations. The remote study of the self-assessment documents was carried out in advance. The on-site evaluation was performed by the entire evaluation team on November 10, 2010 on the premises of KUT.

Wednesday, 10 November

9.00 – 10.30 Meeting with staff responsible for preparation of SAR

10.30 – 10.45 *Break*

10.45 – 12.00 Meeting with teaching staff

12.00 – 13.00 Meeting with students

13.00 – 14.00 *Lunch*

14.00 – 15.15 Visiting auditoriums, libraries, other facilities (studios, teaching spaces, computer services, etc.)

15.15 – 16.00 Familiarizing with students’ course papers, examination material (no final thesis)

16.00 – 16.45 Meeting with employers and alumni

16.45 – 17.00 Experts private discussion and finalisation of the visit

17.00 – 17.15 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:

SER - Self-evaluation report

MA - Master

BA - Bachelor

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

1.1. Programme demand, purpose and aims

The graduates of this programme are needed mainly in power generation, transmission and distribution organisations. Manufacturing electric industry and organisations with high electricity consumption might employ these BA graduates as well. The main tendencies for the development of the Baltic power systems are: enhancement of infrastructure and diversification of power supply, power efficiency and the best use of local resources. These tendencies lie at the basis of the strategic plan for ensuring energy security and power supply reliability for the Baltic countries. The support plan for the Baltic countries developed by the European Commission (Baltic Energy Market Interconnection Plan) provides for significant investments in the construction of new generating sources and development of interconnections of the Baltic region with Nordic countries and continental Europe. Consistent investments in the cross-border power infrastructures will lead to accelerating coordination of legislative acts of the power market participants. The support of national regulators and operators of the transmission and distribution systems will be needed when proceeding towards a higher power security level.

This is a four years programme of 160 credits and thus larger than a typical European BA programme for science universities. The purpose of the Electric Power Engineering technologies programme is to provide first level university education as well as knowledge in special subjects of study field. The programme is fully compliant with the University mission and development strategy of KUT. The composition of the programme meets EU directives, the state law and KUT documents. Also a part time study programme in this field has been arranged but stopped recently. More or less parallel BA programmes exist also in Vilnius and Siauliai. KUT offers here deeper specializations and includes important topics such as high voltage engineering and power electronics. Its profile is nation wide.

The aims of the programme correspond general requirements of engineering studies: to provide theoretical fundamentals of business, management, humanitarian, social sciences, electrical engineering, power and control systems and to develop practical skills in these fields. The programme aims are relevant to the purpose of the programme: to prepare engineers suitable for application in different fields of industry and to aspire the second cycle studies in university.

1.2. Learning outcomes 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 in principal

correspond to the programme aims. The complexity level of the learning outcomes corresponds to the qualification requirements described in national and EU documents. The outcomes are challenging but might be achievable during the four years study period.

The learning outcomes were updated in 2005. Learning outcomes at the programme level correspond to the programme requirements. Learning outcomes of the programme are in good correlation with those of the subject level. It is usual that students continue to MA studies because MA graduates are more appreciated in the power industry.

A faculty level Study programme committee makes an assessment of learning outcomes typically every third year. Courses in modern topics supporting e.g. SmartGrids have been added recently.

2. Curriculum design

2.1. Programme structure

A very special Lithuanian four years BA programme is also evaluated here. The programme volume is 160 national credits which correspond to the 240 ECTS credits. The volume of studies well fulfils the requirements to the volume of BA studies according to the Lithuanian legal requirements of the higher education and average BA study volume in EU. The volume is sufficient and much larger than the required minimum according to European standards.

The study subjects are consistent and the courses organised in a reasonable sequence starting from physics and maths and proceeding to electric power applications. The content is conventional, but also local and modern influence is found, e.g. courses in electric power systems for enterprises and Electric power markets.

2.2. Programme content

The programme content complies well with the legal acts and learning outcomes. The relatively large number of courses in electrical engineering helps the graduate to enter the industries.

There are two specialisation alternatives:

- Electric power system technologies, operation and control
- Energy management

These are relevant but perhaps the title of the first one is too long. The programme content is rational and the courses are comprehensive. In the Appendix (200 pages) of the SER each course

is described in a versatile and very detailed way. Teaching slides are shown and made available for the students. Lectures are supported sufficiently with laboratory exercises.

3. Staff

3.1. Staff composition and turnover

This study programme organised by the described way needs a large amount of manpower and would be extremely expensive if the salary level were higher. At KUT there is a relatively large number of teachers of core courses in the retirement age. There is no doubt that these professors have lots of experience and pedagogical skill. On the other hand it would be important to have a clear strategy for the renewal of the academic staff. Neither in the SER nor in the discussions during the onsite visit a clear and rational renewal strategy of the teaching staff was presented. In Lithuania there is a heavy teaching load allocated for nearly every teacher which cuts resources for research. It is good that doctoral students also participate in teaching and thus inject fresh ideas and cut the teaching load of the permanent staff. The number of doctoral students is low, however.

Some replacements due to retirements have occurred recently. Also the practice of five year terms with public competition should contribute up keeping the competence and give chances to newcomers. In some cases this “auditing” frequency is 10 years and does not seem so efficient.

3.2. Staff competence

Teachers’ research activities, assessed on the base of the publication list included in CV’s, are in correlation with the study programme. Typically publications of the staff are very local, however. Some of the professors have international experience e.g. in European research projects or working at universities in USA. Details are listed in the SER.

There is a large number of teachers, all with a very heavy teaching load in hours, is in their vacancies. Such a volume is relevant if so many separate and often small courses are maintained. Typically the staff experience is mainly from KUT, more circulation is recommended.

4. Facilities and learning resources

4.1. Facilities

Currently there is no shortage of classrooms; a reasonable number of big and small lecture halls are listed. These facilities are considered as granted; no fees are calculated for the department based on the utilisation of rooms which may decrease the rationality in their utilisation. (That seems to be the situation also elsewhere in Lithuania). The library is well equipped and appreciated by the students.

The teaching laboratories are well equipped and relatively modern. A new building is under construction in the campus and will further improve the conditions.

There are no big problems with practical training. Students find training positions without bigger difficulties by themselves or by appointment through the university. 8 – 10 week training in industry is scheduled in spring.

4.2. Learning resources

Power engineering books, journals and data bases are available for students. The most important publications for the BA programme are relatively new and nearly all in Lithuanian. Thus typically the required material is available without extra costs for the students.

Methodological guides for professional training organisation and report preparation are available. Slides and tasks for home work are available by internet; group e-mail addresses of students are used.

5. Study process and student assessment

5.1. Student admission

It has been mentioned during the onsite visit that this programme is one of the most popular one among the 27 BA programmes at KUT. Admission of the candidates is organised in two stages: the main admission to the study programmes or programme groups of all institutions of higher education according single common application and the second (additional) admission to the left free after the first stage state financed places and self financed places. Quite a large range of the applicants' competition grades show that this programme is chosen by students with different basic level of competence.

Based on the statistics presented in the SER the dropout rate of students is big in the very beginning of studies, later much less. This problem has been recognised by the university, and

student services have been improved and supplementary courses in mathematics has been arranged. The situation has improved recently after introducing a student-basket. Most probably an essential reason for drop-outs is typically a low motivation or low qualifications to enter university level studies. More efforts for improving the attraction of these studies should be needed from the faculty members.

5.2. Study process

The schedule of the study classes is well explained and consistent with the objectives of the programme. The schedule of examinations sessions is arranged in a relevant way and well communicated to the students in advance.

The monitoring is based on exams. Regulations how to repeat a failed exam are strict. The drop-out during the whole study period is 50 % which is high. Arrangements for recognising the problems in time and for rearranging the study schedules have been done and the dropout rate has recently decreased.

The mobility among both teachers and students is on a low level. Referring to the interview of students they seem to have interest but the topic is new and there are fears that the credits earned abroad might not always be valid at KUT. Concerning teachers the situation seems to be parallel, and not so much benefit for career development can be expected there. More information and motivation by the teaching staff and management respectively is required to change this situation.

5.3. Student support

The information provided by KUT for interested students is good. At the beginning of each semester the students are provided with the programme of a study subject assessment methodology, specific features of the subject are introduced, time and place for consultations is arranged and other information actual for studies is provided. KUT pays much attention to familiarise the students with career possibilities e.g. by arranging excursions to companies already during the first study year.

Scholarships and support is available but the level is typically low. University dormitories are available in a flexible way and they are cheap. Two students typically share a room. Healthcare or cultural support was not discussed and it is a political question how such topics are shared between the government, student union and university.

5.4. Student achievement assessment

The results of self education and exams are combined. The criteria are published in web and thus public. In this way a relevant correlation with the intended learning outcomes can be obtained.

The evaluations of the exams of individual student works are given to the students and often discussed individually as well. This is an efficient way.

BA theses are defended at the meeting of the Electric Power Technologies study field qualification committee. The thesis is presented to the head of department who appoints the reviewer, and the other members of the committee. The whole procedure is quite a complicated practice requiring lots of (administrative) work. This kind of sessions is arranged typically only once a year which saves costs but may be inconvenient for some students and delays their degree. This is an efficient way but has drawbacks mentioned above.

5.5. Graduates placement

The majority of BA graduates continue their studies in the MA programme. That seems strange because also the BA degree includes so many courses that it should qualify for engineer jobs. Perhaps the thinking skills do not develop satisfactorily in such strictly structured studies. Based on the interviews many employers prefer an MA degree.

6. Programme management

6.1. Programme administration

The study programme is revised at the Study Programme Committee of the Faculty of Electrical and Control Engineering. The Committee selects and assesses subjects of the study field for one year (when a subject for assessment is presented the first time) or for three years (when a subject for assessment is presented repeatedly). When certain doubts concerning content of a subject arise the subject is revised, improvements are made and it is reassessed before regular term. For coordination of a study programme this seems an efficient way. For the contents of a single course its teacher must have a leading impact.

6.2. Internal quality assurance

The internal quality assurance of studies is based on internal regulations at University level. Feedback from students is collected after each course. Confidentiality is maintained and only summaries published. The participation of the students to this procedure is not on a satisfactory level and – based on an interview - they do not see that it would have a real impact. There is obviously something wrong in the procedure practised at KUT and therefore it should be reviewed. In general, students are satisfied with the education they receive, however.

Typically many issues seem to be regulated above the teaching staff which may delay realisations of reforms (see 6.1.).

In relation to the whole budget very much funds are received from the power industry. This must also have a positive impact on the curriculum development. The feedback from students or individual teachers does not seem to have so much impact. Employers are happy with the present number of students but afraid that the number might decrease in the future. There is a representative from industries in the First level studies qualification commission. Furthermore, related to training and BA theses feedback from industries is obtained.

III. RECOMMENDATIONS

3.1. It might be useful to concentrate to one single BA programme in electric power engineering. If two specialisations are needed perhaps the second one might be a part time study programme.

3.2. The teaching load of professors and other researchers should be reduced to allow better conditions for research.

3.3. The evaluation of the theses should be simplified. In addition to the supervisor only one independent reviewer would be enough.

3.4. Coordination with similar programmes in other Lithuanian universities should be improved primarily on departmental level.

3.5. A continuous support from power industry is important; the utilisation of these funds should be rethought carefully.

IV. GENERAL ASSESSMENT

The study programme *Electric power engineering technologies* (state code – 61201T103 (612H63001)) is given **positive** evaluation.

Table. *Study programme assessment in points by evaluation areas.*

No.	Evaluation area	Assessment in points*
1	Programme aims and learning outcomes	3
2	Curriculum design	3
3	Staff	3
4	Facilities and learning resources	3
5	Study process and student assessment (student admission, student support, student achievement assessment)	3
6	Programme management (programme administration, internal quality assurance)	3
	Total:	18

*1 (unsatisfactory) - there are essential shortcomings that must be eliminated

2 (poor) - meets the established minimum requirements, needs improvement

3 (good) - the area develops systematically, has distinctive features

4 (very good) - the area is exceptionally good

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