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Programme accreditation

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Final Study Programme Evaluation Elektros ir automatikos inžinerija (professional bachelor)

at

Vilniaus technologijų ir dizaino kolegija (Vilnius College of Technologies & Design)

Assessment report

4 May 2012

Assessement report of the professional bachelor study programme Electrical and Automation Engineering. The final evaluation was carried out by **evalag** as part of the Engineering field of study programs Electrical and Automation Engineering and Railway Transport Engineering and the social science study program Transport Logistics renewal project No. VP1-2.2-ŠMM-07-K-01-049.

MOKSLAS · EKONOMIKA · SANGLAUDA
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Preamble

The "Vilniaus technologijų ir dizaino kolegija" " is – due to the Lithuanian education system – a „kolegija". The education at a "kolegija" is practice-oriented and the qualification of graduates meets the expectations of the regional industry.

The English name "Vilnius University of Applied Engineering Sciences" which is mentioned in the self-evaluation report is not coherent with the internationally accepted terminology ("Vilnius College of Technologies & Design). Therefore, only the Lithuanian name of the institution will be used in this report.

The English name of the study programme "Electrical and Automation Engineering" does not correspond to the content of the education. With regard to the curriculum and education profile, the study programme "Electrical and Automation Engineering" has to be renamed into "Electrical Energy and Automation". The name of the study programme in Lithuanian is not affected.

This preamble is the prerequisite for the following assessments and recommendations in the expert report.

1. Vilniaus technologijų ir dizaino kolegija (VTDK)

Vilniaus technologijų ir dizaino kolegija (VTDK) is a public Lithuanian non-university higher education institution that offers college level study programmes which are directed towards a professional activity. The VTDK in its present form was created by merging several colleges in Vilnius in the fields of engineering and design – this gives the VTDK its distinct profile.

According to Lithuanian law, college level higher education institutions (kolegija) offer full-time and part-time professional bachelor degrees that allow graduates to pursue a professional career. Master degrees are not offered. Graduates who want to pursue a master degree at a Lithuanian university need to complete one and a half years of bridge courses to meet the admission requirements.

VTDK has about 4000 students and offers 22 professional bachelor programmes in the fields of engineering and design in the following four faculties:

- Civil Engineering Faculty
- Faculty of Design
- Petro Vileišio Faculty of Railway Transport
- Faculty of Technical Sciences

The VTDK's mission is to be a partner in the development of a sustainable society. On the basis of this mission the VTDK has developed a strategic plan for its development and management. VTDK has recently been very active and successful in acquiring EU-funding. VTDK finished or still carries out a number of projects to renew its study programmes, to renovate its building, to update its equipment, to develop its staff, to collaborate with its European partner institutions and to develop its internal quality management.

The final expert evaluation (the performance principles, steps, processes, and procedures of the evaluation) was conducted in accordance with the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (2005) and documents regulating the implementation and evaluation of study programmes in the Republic of Lithuania (*Study Programme External Evaluation and Accreditation Procedures Description*, approved by the July 24, 2009, Order No. ISAK-1652 of the Minister of Education and Science of the Republic of Lithuania, and *Study Programmes Intended-To-Be-Implemented Preparation Description and Their Compliance With Approved General And Specific Requirements For Study Programmes Establishing Methodological Guidelines Approved by the Minister of Education and Science of the Republic of Lithuania*, approved by the March 3, 2010, Order No. 1-01-18 of the Director of the Centre for Quality Assessment in Higher Education (December 20, 2010, Order No. 1-01-163 revision), *Degree-awarding undergraduate and integrated study programme general requirements,* approved by the April 9, 2010, Order No. V-501 of the Minister of Education of the Republic of Lithuania and Science, etc.).

The assessment of the programme consists of two parts which complement one another. On the one hand the programme was assessed to be registered according to Lithuanian law which allows the programme to go into operation. For its registration the programme has to comply with the general requirements for study programmes as laid out in Order # V-501 and meet the assessment criteria for new study programmes as described in Order # 1-01-18. On the other hand the programme was assessed to receive **evalag**'s international label of study programmes. For this label **evalag** uses the European Standards and Guidelines for Quality Assurance in the European Higher Education Areas (part 1) and national criteria for programme assessment. In this case, in addition to the above mentioned orders, the criteria for existing programmes were used as described in Order # 1-01-162. The two sets of criteria are compatible insofar as the criteria for new study programmes are a subset of the criteria for existing programmes taking into account that some information may not be available for newly created study programmes.

The VTDK produced the self-evaluation report according to the Lithuanian guidelines for new study programmes (yet-to-be implemented programmes) as outlined in Order # 1-01-18 and submitted it to **evalag**. **evalag** formed an expert team consisting of four professorial experts and one student expert:

- Prof. Dr.-Ing. Dietmar A. Brück, Hochschule für Technik und Wirtschaft des Saarlandes
- Matthias Lieske, Brandenburgische Technische Universität Cottbus
- Prof. Dr.-Ing. Heiner Ryssel, Friedrich-Alexander-Universität Erlangen-Nürnberg
- Prof. Dr.-Ing. Anne Suse Schulz-Beenken, Fachhochschule Südwestfalen
- Prof. Dr.-Ing. Axel Schumacher, Hochschule für Angewandte Wissenschaften Hamburg

The site visit took place on 12 to 14 March 2012 at VTDK. During the site visit the expert team met with representatives of the programme, the VTDK administration, students, teaching staff, graduates and employers and visited the laboratories and seminar rooms used by the programme.

The expert team produced an assessment report of the programme with an accreditation recommendation which was submitted to **evalag**'s accreditation commission that took the final accreditation decision in May 2012.

The English name of the study programme "Electrical and Automation Engineering" does not fit entirely the competence and knowledge expectations, which are associated with an engineer. For an engineer you would expect broader competences in designing and planning electrical and automation equipment as well as infrastructure. These competences, however, are not included in the curriculum of the study programme. The students are not educated for designing or constructing but rather for operating and maintaining electrical infrastructure.

The expert team values the good employment opportunities of the graduates which are linked to the practice-oriented education and the good cooperation of VTDK and Lithuanian employers in designing and developing the study programme.

The report also mentioned that graduates of the study programme are able to "design electric networks and systems" (self-evaluation report page 8). However, the expert team misses the appropriate subjects that impart the necessary competences for designing electrical and automation engineering systems. The expert team sees the main focus of the programme on installing and maintaining them. The study programme is situated on the professional college level targeted to a professionally and practically oriented education of the graduates. This implies that the programme does not cover the complete scientific knowledge of the field but rather focuses of basic scientific knowledge, necessary to understand the underlying concepts.

The expert team appreciates in principle that the VDTK offers a general studies part in its study programmes to develop general education, creative thinking and language skills. The expert team, however, believes that the general studies part of the study programme could be more useful if its contents were specifically tailored to the needs of the future graduates.

Recommendations

The English name of the study programme "Electrical and Automation Engineering" does not correspond to the content of the education. With regard to the curriculum and education profile, the study programme "Electrical and Automation Engineering" has to be renamed into "Electrical Energy and Automation". The name of the study programme in Lithuanian (Elektros ir automatikos inžinerija) is not affected.

The expert team recommends the rephrasing of the programme goals and learning outcomes of the study programme by confining them to basic scientific or technological knowledge and avoiding the design competences of electrical and automation engineering systems.

The expert group encourages the VDTK to closely monitor the economic situation of the Lithuanian electric and automation sector in order to be able to react quickly in case of changes that may affect the employability of their graduates.

The experts suggest the VDTK to reconsider the emphasis of its general studies subjects and to develop an offer of key competences courses that is tailored to the needs of professional engineers and the creative thinking of students. This could include method competence (e.g. project management) and soft skill courses (e.g. conflict management). These courses could be offered as electives of the general studies part and, if necessary, adapted to all other study programmes of the VDTK.

The subject and module descriptions are mostly exemplary and give students and teaching staff a comprehensive overview over content, learning outcomes, working methods, assessment and workload of the subjects and modules. The English terminology in the programme description should be revised. The programme description should also clearly show where competencies such as programming are taught.

According to the expert team the curriculum meets the general requirements for study programmes as laid out in Order # V-501.

Recommendations

The expert team encourages the VDTK to continue updating the curriculum of the programme regularly and adjust it to the needs of the labour market. In further developing the study programme the experts especially encourage the VDTK to proactively implement new technologies, fields and innovations in the curriculum instead of merely adjusting the programme according to employers' suggestions. The VDTK should take the lead as a programme innovator in order to be ahead of changes in the electrical and automation sector to secure and improve the employability of its future graduates. In doing so, the VDTK should build on the experience and ideas of its teaching staff.

In updating the programme the VDTK should consider broadening the programme in the field of automation and the above-mentioned subjects should play a central role in the education. Furthermore the subject chemistry does not reflect the latest achievements in science and technology in the electrical and automation field, therefore the experts recommend to delete the chemistry subject from the curriculum. In contrast, the experts recommend strongly that the safety lectures should be strictly retained.

Regarding the free electives with nine credits the expert team recommends to reconsider the free selection opportunity due to the already tight curriculum design. Considering this aspect, the VDTK should use these credits only for subject-related electives or subject-supporting courses and not for courses like professional etiquette or rhetorical communication.

4.3 Teaching staff

Current situation

VTDK has a teaching staff of 72 persons in the technical faculty. The majority of the teaching staff holds a Master degree or an equivalent. Four teaching staff members hold a Ph.D. degree; four teaching staff members hold a doctor of technical science; seven are associate professors of VTDK. 66 lecturers have practical experience from a job in a company. According to the VDTK, about 65% of the lecturers are employed full-time; the remaining 35% are part-time employed. 20 lecturers are involved in teaching the study field subjects for the programme.

The activities of staff members are in principle confined to teaching. The workload of lecturers is 1548 annual hours which is approximately 18 weekly teaching hours. The remaining time is used for consultation hours, preparation of teaching materials, staff development and scientific work. Fundamental scientific research, however, is not a primary task, as kolegija's in Lithuania are not supposed to engage in research activities. The VDTK, however, encourages its staff to do applied research and supports projects proposed by staff members.

eleven laboratories for the different subject fields according to the self-evaluation report. The rooms and laboratories are shared with other study programmes.

The computer rooms are excellent equipped with the common software used in the field such as CADS Planner Electric, Optiwin, AutoCAD and FluidSim. The laboratories are equipped with usual laboratory equipment such as electronics, digital electronics and drives. A basic installation of PLC was missed; it should be in integrated in further plans of updating the laboratories. The equipment and software was mostly financed by EU funding or donated by companies in the field. The self-evaluation report mentioned and the VDTK informed during the site visit, that it is planned to update the laboratory material base in 2012 and to acquire modern equipment for a new Electric Network Modelling laboratory.

The library offers textbooks and learning resources for the students and gives access to journals in the field. The literature is mostly in Lithuanian or Russian. Most textbooks or methodological publications are prepared by the lecturers and are available in sufficient numbers for the students in the library or online via Moodle.

Assessment

According to the experts, the facilities for the study programme are adequate in size and quality to provide a good learning experience. The team commends the VDTK to its excellent and up-to-date software equipment which provide very good conditions for the practical education of the students. The laboratories are adequately equipped to train the students to perform tasks related to the future employments. The majority of the software and equipment used by the VDTK is by and large the same as the infrastructure used by companies in the sector. The expert group commend the VDTK for its efforts to acquire equipment or funding for it from different sources to provide its students learning opportunities in good equipped laboratories.

The textbooks or methodological publications provided by the lecturers are well structured and provide students good support in acquiring knowledge and competences in the respective subject matter. The experts commend the VDTK to its wide-spread use of Moodle as learning platform for their study programmes. With its library facilities the students have access to the basic publications necessary to complete their studies. As the large majority of the publications are in Lithuanian or Russian, the expert team misses fundamental and current English literature in the field. Altogether the VDTK is well equipped in terms of its facilities – especially regarding the software – to offer the study programme.

Recommendation

Although the VDTK has appropriate laboratory equipment, the experts recommend to continuously modernize the laboratory equipment and to improve the equipment in the areas of PLC and microcontroller. The experts recommend that the VDTK should use and expand in this context, the relationships with existing industry partners. The expert team also got the impression that the laboratories are not used to an appropriate extent. Therefore they suggest a stronger integration of the laboratory equipment in the laboratory work of the study programme. Some of the experiments in the hands-on training labs need to be improved concerning electrical safety.

The expert team recommends the VDTK to acquire a basic equipment of current English literature in the field as a reference for its lecturers and students. This will support the lecturers and students to keep up-to date with current topics and trends in the field of electric and automation in order to further develop the study programme.

Bulgaria, Estonia and Hungary. The number of incoming exchange or full students, however, is low, as the VDTK does not yet offer courses in English.

After finishing their studies the majority of the graduates search – mostly successfully according to the information of the VDTK – a job in their profession. Each year about 10-15 graduates begin a master programme. In order to meet the admission requirements for a master programme at a Lithuanian university, the graduates with a professional bachelor degree need to attend one and a half years of bridge courses.

Assessment

To the expert team the study process of the programme seems to be well organised and balanced. The organisation of the study process seems to be adequate to achieve the intended learning outcomes. This assessment is also confirmed by the students during the site visit who were in general satisfied with their situation and appreciate VTDK due to its good reputation and good job opportunities. The students also mentioned the easy and close contact with their lecturers. The assessment scheme is transparently described and uses multiple assessment methods to check different competences of the students. The study programme documents are available on the VDTK's websites.

The VDTK also offers its students opportunities for international mobility. The expert team encourages to strengthen these mobility programmes and to further motivate students to participate in student exchanges. Therefore, the existing partnerships could be used. Furthermore, the experts emphasise the importance of English courses for local students. One necessary precondition to increase mobility is to provide favourable conditions for incoming students. Therefore, the experts see it as indispensable to offer courses in English in order to increase the attractiveness of the VDTK for foreign exchange students.

The academic and social support of the students seems to be appropriate. The students report a clearly structured but also tight study process and are in general satisfied with their situation at the VDTK. Lodging seems to be no problem, also due to the good supply of student housing by the VDTK.

In order to reduce drop-out rates in the study programmes, the VDTK introduced a larger number of individual consultation hours in the renewed study programme. These consultation hours may help addressing individual problems of the students and support them to progress in their studies if needed. The experts encourage the VDTK to pursue this measure and monitor its results.

Due to the close cooperation with employers in designing the study programmes and during the practical periods during the programme, the students are mostly able to find appropriate jobs in their profession. The students as well as the graduates mentioned during the site visit that finding a job is no big issue for them as they see themselves largely well prepared. Due to the professional profile of the study programme, the possibilities for continuing education are limited as bridge courses are necessary to start a master programme at a Lithuanian university.

Recommendations

In order to encourage and strengthen international mobility of the students, the experts recommend strengthening the English language education of the students and offering courses in English in order to attract foreign exchange students. Therefore, the English language capacities of the teaching staff need to be strengthened as well. The experts

In terms of the student course/subject evaluation there seems to be a lack of a clear process to the expert team. During the site visit it did not become clear, whether the course/subject evaluations carried out, analysed and followed-up in a standardised process.

The experts commend the VDTK on its efforts to improve its internal quality management system in an EU-funded project and support the VDTK to fully implement the results of this project. As the project is not yet implemented the quality management system cannot be fully assessed at this stage.

Recommendations

The expert team also recommends strongly a regular and standardised process for the student course evaluations. The process should assure a clear, transparent and regular feedback of the results to lecturers and students. The evaluation should be organised and carried out by an independent body or person in charge. The dean should only be involved to mediate and coordinate the follow-up of the evaluations.

The expert team recommends the VDTK using the opportunity of the EU-funded quality assurance project to design and implement an integrated strategic quality management system that builds on the strategic objectives of the VDTK and the study programmes, uses diverse sources of information to analyse the quality and derives and implements measures for improvement. The VDTK needs to assure that the quality management system supports the lecturers in providing a good learning experience and reduces bureaucracy.

To fully use the capacities of the already build up quality management system the experts invite the VDTK to use statistics more systematically in its internal quality assurance processes.

5. Overall assessment

In general the expert team assesses the professional bachelor study programme "Elektros ir automatikos inžinerija" positively. The VDTK provides a solid education and prepares the students well for their future profession. The professional character of the programme is clearly described in the learning outcomes. Curriculum and study process are clearly structured and appropriate to achieve these learning outcomes. The programme management and the quality assurance seem to be appropriate to manage and improve the programme. The expert team values the close cooperation of the VDTK with employers in order to support the study process and to constantly develop the study programme and focus the competences of the graduates to the needs of the labour market. A great asset of the VDTK is its motivated teaching staff. The efforts of the VDTK in providing good learning opportunities are also valued by the students.

The expert team sees the main area for development in using the VDTK's potential for innovation in order to proactively develop the study programme in the future. In further developing the programme the VDTK should assume the role of the leader and innovator and propose programme innovations that meet the future needs of the labour market. Therefore, the staff needs to keep up with current trends in the academic as well as professional field to be able to react appropriately and prepare graduates ahead of time to changes in the economic environment.

Evaluation Scores

No	Evaluation Area	Evaluation of the area, points
1	Programme aims and learning outcomes	3
2	Curriculum design	3
3	Teaching staff	3
4	Facilities and learning resources (facilities, equipment, learning materials)	2
5	Study process and students' performance assessment (student selection, performance assessment, support)	3
6	Programme management (administration of the programme, internal quality assurance)	3
	Total	**17** Maximum score: 24

Evaluation scale

Level/Score	Evaluation	Description
1	Unsatisfactory	There are essential irregularities to be eliminate
2	Satisfactory	Meets the minimum requirements, requires improvement
3	Good	The area is systemically developed and possesses original features
4	Very good	The area is exceptionally good