



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

**KAUNO MIŠKŲ IR APLINKOS INŽINERIJOS
KOLEGIJOS
HIDROTECHNIKOS PROGRAMOS (653H17004)
VERTINIMO IŠVADOS**

**EVALUATION REPORT
OF *HYDRAULIC ENGINEERING* (653H17004)
STUDY PROGRAMME
at KAUNAS FORESTRY AND ENVIRONMENTAL
ENGINEERING UNIVERSITY OF APPLIED SCIENCES**

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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Hidrotechnika</i>
Valstybinis kodas	653H17004
Studijų sritis	Technologijos mokslai
Studijų kryptis	Bendroji inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3 metai)
Studijų programos apimtis kreditais	180
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Aplinkos inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	1991-04-23 Nr. 1232-113

INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	Hydraulic Engineering
State code	653H17004
Study area	Technological Sciences
Study field	H100 General Engineering
Kind of the study programme	NU (non-university)
Level of studies	First
Study mode (length in years)	full-time (3 years)
Scope of the study programme in credits	180 credits
Degree and (or) professional qualifications awarded	Professional Bachelor Qualification of Environmental Engineering
Date of registration of the study programme	1991-04-23 No 1232-113

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The Centre for Quality Assessment in Higher Education

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I. INTRODUCTION

The external assessment procedures of the study programme were initiated by the Centre for Quality Assessment in Higher Education in Lithuania nominating the external assessment peer group of Prof. Petras Punys (Lithuania – Chairman), Prof. Silke Ursula Wieprecht (Germany), Dr. Sarma Valtere (Latvia), M.Sc. Jurgita Daniliauskaitė (Lithuania), M.Sc. Kęstutis Skrupskelis (Lithuania).

The basis for the evaluation report is the written Self-Assessment Report (SAR), its annexes and the site visit of the experts on 12th September 2012. During this visit the experts reviewed the organisation of the programme, the way in which the curriculum had been designed, the way the study quality was being assured, the qualification of the staff, facilities and learning resources, study process, students assessment and programme management.

Kaunas Forestry and Environmental Engineering University of Applied Sciences (hereafter KFEEUAS or College) consists of two faculties, namely *Forestry and Landscape Architecture* and *Environmental Engineering*. The structural department of implementing Hydraulic Engineering study programme is the department of Hydrotechnical Construction in Environmental Engineering Faculty.

The KFEEUAS is a unique institution in Lithuania offering a qualification of professional bachelors in the program Hydraulic Engineering with a strong emphasis on practical work.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The aims of the programme are essential for qualifying professional bachelors in hydraulic engineering market segment. The self assessment report (SAR) lists a large number of learning outcomes (17 in total) in order to achieve aims of the study programme. Learning outcomes sound achievable and they can be publicly accessible.

While comparing links of the programme aims, outcomes and subjects, a question can be raised about so numerous learning outcomes. When checking all descriptors of the subjects (Annex 1) it's obvious that many subjects are related with the same learning outcomes. Some learning outcomes are achieved by a very big amount of study subjects. For example, the learning outcome Nr. 11 is achieved by 39 study subjects (Annex 7). Consequently learning outcomes are not well defined, they need to be adjusted.

The programme aims and learning outcomes are approved according to legislation in force. Senior administrators are keen to ensure a practical applicability of the obtained education. According to them, the programme should more focus on the applied sciences and engineering subjects. The graduates with engineering speciality are more demanded in the labour market.

Stakeholders/employers are satisfied with the college's students, and their judgement is that the professional bachelors from this college fit for the jobs better than bachelors graduated from universities. However, there are some gaps in the education. Theoretical learning outcomes (for instance, - physics, mathematics and especially chemistry) are insufficient. Moreover, the students are lacking good communication skills, especially in communicating with senior specialists and/or elder people. Computer skills and knowledge of civil law could be better too.

Furthermore, there are a mix of environmental and civil engineering knowledge that is influenced by interests of employers. The themes of the Bachelor's theses vary a lot, but only 3 to 4 of them relate directly to the Hydraulic Engineering speciality.

The programme aims and learning outcomes are consistent with the type and level of studies and the level of qualifications offered. However, programme aims and learning outcomes are not defined very clear. According to the study program, offered qualification level meets the established minimum requirements but needs improvement, especially on the level of theoretical knowledge.

The name of the programme, its learning outcomes, content and offered qualification are not well compatible with each other. Content of the programme is suitable for general civil engineering programmes, and name "Hydraulic engineering" doesn't completely reflect it. The offered qualification is appropriate only for the regional labour market and without strong theoretical knowledge base it is suitable only for the lowest category of employee.

2. Curriculum design

The development of the curriculum is organised under supervision of the Faculty administration, department responsible for this programme and programme management committee. The curriculum design meets legal requirements for the College studies. Its structure is developed to reach the aims of the programme and to provide wide enough general training and skills to be competitive in the labour market, as it has been stated by the employers and graduates.

The study subjects cover a broad scope of civil engineering subjects, even those that seems to be not in need for Hydraulic Engineering (for instance - Local Roads, Management of Renewable Natural Resources). The sequences of the study courses seem to logic. Despite this a fundamental background of the curriculum is quite weak. 5 credits are assigned for mathematics, 3 credits for physics (environmental), but chemistry subject is excluded *per se*. It must be a compulsory subject. It is disputable even the name of Environmental Physics. Of course, its content must provide students with the fundamental knowledge, with focus on the water environment. Foreign language teaching should be also strengthen (3 credits actually) taking into account the fact that the College is keen to act on the international level.

There are a large number of subjects, in total - 48. A lot of subjects (21) have volume of 3 credits and that makes a big diversity of subjects. It would be advised to group similar subject in order to obtain volume of 5 or 6 credits.

The content and methods of the subjects are intended for the achievement of practical skills, but not for theoretical knowledge. However, the scope of the programme is sufficient to ensure main learning outcomes, but it doesn't reflect latest achievements in science and technologies. Some positive steps were seen during the visit. For instance, an operational computerised SCADA facility at the laboratory, but this high-tech is not included in any subject description. Another positive point is that a recently introduced e-learning platform - Course Management System - "Moodle" is intended to be used for students.

Another suggestion for the improvement of this curriculum could be an inclusion of the study courses raising graduates initiative and entrepreneurship as well as managerial skills. This suggestion was confirmed in the meeting with the employers.

3. Staff

The staff includes lecturers with different background and having relevant competences in the area of the study subject. They meet the legal requirements for the College study program. The expert group was positively impressed by the overall quality and quantity of the teaching staff (26 in total) - 8 of them are associate professors. The number of the teaching staff is adequate to ensure learning outcomes. Relatively high percentage of young academic staff gives a good impression about the staff renewal potential.

However, a majority of teachers are coming outside, mainly from traditional universities. Only 3 teachers are working at full time at the department of Hydrotechnical Construction.

The support of the college administration to the improvement of the lecturers professional development is evident. The qualifications of the teaching staff are adequate to ensure learning outcomes. For instance, there is a good initiative in a recently launched virtual and distance learning system "Moodle" that is beneficial for both students and teachers. Some teachers take part in the ERASMUS exchange programmes (on average 1.6 visit per year). A bit lesser rate of the incoming teachers from abroad can be also noted. The teaching staff is involved in applied research directly related to a study programme, they take part to national and international conferences. It has to be noted that their research papers and reports affiliation to KFEEUAS is quite rare. Furthermore they should more actively involve their students in the research activity.

4. Facilities and learning resources

Facilities and learning resources is another good part of the program. Premises for studies are adequate in their size and quality, teaching and learning equipment is updated and easy accessible for all students. The institution has a well-developed infrastructure of practical training and studies.

There is just few things to improve: there is a free access to the main data bases of scientific publications, but students rarely use it because of lack of knowledge, some courses of such as „searching for required information“ can be presented even by librarian. There is a lack of new hydraulic subject books in library, but it seems to be improved in the near future.

Under an agreement between the KFEEUAS and A. Stulginskis University, students are conducting their structural and hydraulic engineering practical assignments at the latter laboratories. There is an amazing „play ground“ for displaying physical hydraulic models in an open air laboratory, but it needs upgrading. A problem would be the location of labs that are far distanced from the college. But students confirmed no difficulty reaching them. Even to facilitate getting the college that is located far outside the city a bus schedule was adapted to the students needs.

The access to computer facilities is adequate as well as numerous professional licensed software (GIS, AutoCAD, GeoMap) is available for students ensuring their ability to gain necessary practical training to be able to enter the labour market. But specialized hydraulic engineering software are still lacking. For this purpose it can be advised to use even publically available software.

The college administration is quite active in initiation of a variety of structural projects in order to upgrade college infrastructure, teaching and learning resources. Along this there can be also mentioned a strong determination towards a practical use of computerised and IT based facilities (e.g., SCADA) meeting demand of the market.

A wide list for selection students' practice shows a good collaboration with social partners. The teaching material for lectures are accessible via recently introduced e-learning "Moodle" system.

5. Study process and student assessment

The SAR provides a clear picture of the admission procedures. They are available also on the Internet, and main information about study process, programme aims and learning outcomes are well-founded. The admission requirements are the following: exams of Chemistry or Physics, Mathematics, Lithuanian language (test), also foreign language. But during the study process more attention is paid for physics than chemistry.

The average competitive mark of the entrants to the programme is quite low but it has been growing for the past few years. It means that students who come to study to the programme need more help in learning process. The learning outcomes are quite hard to achieve for such students.

The SAR provides quite detailed information about students sport, artistic activity but there is lacking any description about their scientific activity (for instance, participating in students' conferences, etc.). There are opportunities to participate in the students' conferences, but they are generally passive. The College (teachers, administration etc.) should find way to more actively involve students for applied research.

The number of outgoing students through mobility programmes is given, but the SAR does not give information about opportunities to come study to the programme. Students have an opportunity to participate in exchange programmes and it's more common for those who are going for training practice in summer rather than those for studying in a similar programme.

It can be clearly stated that administration is doing all the best in order to ensure an adequate level of academic and social support despite the fact that for the past years (2010 and 2011) the number of graduates reduced dramatically (more than 2 times). The college administration is trying to reduce drop outs of students by providing them some social support. Teachers help to set up students' "business plans".

The students have close relations with the teachers and administration staff. They can communicate with teachers by e-mail in every time. Working students can study according to their individual plans since the Administration is interested in more successful graduates. The experts were told that students do not receive any scholarship but they can get "motivation" scholarships after the first semester.

Students are not eager to participate in any other social activities justifying this reluctance by college remoteness from the city centre.

Assessment system of students' performance is not very clear, except the fact that students are free to discuss with teachers on every mark they get. There is no really working formal legislation on student evaluation (it must be done immediately). Though an assessment system is introduced to the students during a first lecture by the teachers. Some questionnaires are offered for the students about taught subject at the end of semester. But it is not clear enough whether the students are getting feedback.

The fact, that the "credit is passed provided a student acquired more than 50% of the knowledge and abilities within the subject description" means, that it's too easy to pass exams (50% is too low; it should be 70% at least). Evaluation of the practice realized in the industry (mark given)

should be done by the teacher after student demonstrates his practical skills; it shouldn't be evaluated just by recommendations of practice supervisor (usually by an employer).

Some of the graduates are planning to enter any university, mostly A. Stulginskis University for seeking a MSc degree. Employers confirm that higher qualification fosters a career promotion. Others are looking for the work places. It seems that this professional bachelor degree (this qualification) is adequate for getting good jobs (3-4 out of 9 graduates have good jobs).

Programme providers activity on improving programme is prominent, but professional activities of graduates should be improved together with social partners.

6. Programme management

Responsibilities for decisions and monitoring of the implementation of the programme are satisfactory and a main responsibility is held by the department. The description of the study programme is annually reviewed and amendments, if any, are made, but in a formal way.

Each year, after the defense of the Bachelor's theses, outcomes of the study programme, the quality of its preparation and defense itself as well as problems that occurred are analyzed in the meeting, attended by the chairman of National Qualification Commission. Furthermore, guidelines for improving studies of the subsequent year are provided.

Most of changes in the study programme were made after the last external evaluation of the institution. It has been recommended to: develop part time studies; to introduce distant-learning courses; promote lecturers and students mobility programmes. However, a recommendation to significantly increase proportion of the full-time working teachers (not less than 50% of the total) was not achieved.

Regarding the quality of lectures and teachers' competence there is a real possibility for the students to evaluate it putting answers in an on-line available questionnaire. But it's rarely happening. The students' evaluation does not directly influence the results of accreditation of the teachers.

The College communication with the stakeholders is satisfactory. The College disseminates questionnaires for employers, but they usually do not answer. Sometime the employers are invited for discussions with students.

During the practice the students are performing real works. Some of them are officially employed at the enterprises and earn salary. At the end of the practice the stakeholders evaluate students' reports, obtained knowledge and practical skills.

The graduates find their obtained qualification quite good, but they can't answer on the question is it enough for master level studies in a university. Probably they would need to take additional extra courses for this.

Stakeholders are invited to take part on external evaluation, but their evaluation of the programme is based on individual student level, so the quality on assurance measures is not effective or efficient as well.

There is a lack of formal monitoring on the study program, as well as students are not involved to take part in the evaluation. Main outcomes of internal evaluations of the programme are used for the improvement of it, but data about implementation of the programme is incoherent, results

of it analysis are not always used for improvement of the entire programme, usually just for some subjects.

III. RECOMMENDATIONS

1. Aims of the programme should be revised in order to make them compatible with learning outcomes. The latter must be balanced with the number of study subjects. To precise this, there are even 39 study subjects covering only one learning outcome.
2. Adjust the curriculum in order to assure a close transition from fundamental to specialised subjects.
3. Full time teaching staff should be dominating that of partial time.
4. Revise the assessment system of students' performance.
5. Improve internal and external study programme evaluation involving the students.
6. Encourage students for involving them into applied research.
7. Theoretical learning skills and knowledge of foreign language should be improved. The latter will facilitate students exchange under ERASMUS programme.
8. The quality of the practice reports and final theses must be improved, particularly focusing on hydraulic engineering issues.
9. Students are conducting their structural and hydraulic engineering practical assignments outside KFEEUAS at the laboratories of A. Stulginskis University. Existing an open air hydraulic engineering laboratory should be used for students more intensively providing that its infrastructure undergoes a substantial upgrading.
10. Study courses raising initiative, entrepreneurship and communication of the programme graduates should be strengthen. This is a clear demand of the employers.
11. It is highly recommended to continue with the implementation of a course management system "Moodle" as a mandatory platform for all staff members.

IV. SUMMARY

The KFEEUAS is a unique institution in Lithuania offering a qualification of professional bachelors in the program Hydraulic Engineering with a strong emphasis on practical work. It is a flexible programme to cover water related civil and/or environmental engineering issues.

The aims of the programme are essential for qualifying professional bachelors in the hydraulic engineering market segment. Some learning outcomes are achieved by a very big amount of study subjects; therefore, they need to be adjusted.

Stakeholders/employers are satisfied with the college's students. However, theoretical learning outcomes are insufficient; the students are also lacking good communication skills. The offered qualification is appropriate only for the regional labour market and without strong theoretical knowledge base it is suitable only for the lowest category of employee.

The name of the programme, its learning outcomes, content and offered qualification are not well compatible with each other. Content of the programme is suitable for general civil engineering programmes, and name "Hydraulic engineering" doesn't completely reflect it.

The curriculum design meets legal requirements for the College studies. However, it is a kind of "a mosaic", there is no clear line from fundamental to specialized subjects. There are lots of subjects, but their systematic approach is lacking.

The content and methods of the subjects are intended for the achievement of practical skills, but not for theoretical knowledge. However, the scope of the programme is sufficient to ensure main learning outcomes, but it doesn't completely reflect latest achievements in science and technologies. The quality of students practice reports must be improved and final theses have to deal with the hydraulic engineering issues.

The staff meets the legal requirements for the College study programme, most of them possesses doctoral degree. But only a small proportion of them are working as to full time lecturers. The qualifications of the teaching staff are adequate to ensure learning outcomes. For instance, there is a good initiative in a recently launched virtual and distance learning system “Moodle”. Beside this, the teachers should more actively involve their students in the applied research activities.

Facilities and learning recourses is another good part of the programme. Premises for studies are adequate in their size and quality, teaching and learning equipment is updated and easy accessible for all students. The institution has a well-developed infrastructure of practical training and studies. Along this there can be also mentioned a strong determination towards a practical use of computerised and IT based facilities.

Students have an opportunity to participate in exchange programmes, but only few students are going abroad for studies. Assessment system of students’ performance is not very clear, except the fact that students are free to discuss with teachers on every mark they get. There is no really working formal legislation on students’ evaluation.

Responsibilities for decisions and monitoring of the implementation of the programme are satisfactory. Study programme is annually reviewed and amendments, if any, are made, but in a formal way.

Most of changes in the study programme were made after the last external evaluation of the institution. However, a recommendation to significantly increase proportion of the full-time working teachers was not achieved.

The programme graduates entering the labour market have some gaps in skills related to personal initiative, entrepreneurship and communication. There is a lack of formal monitoring on study program, no formal employers or stakeholders’ panel, meeting regularly.

Evaluators appreciate very much a well prepared and systematically presented exposition of teaching material (text books, hand-outs) and students term works/theses during their visit to KFEEUAS.

V. GENERAL ASSESSMENT

The study programme *Hydraulic Engineering* (state code – 653H17004) at Kaunas College of Forestry and Environmental Engineering 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	2
2.	Curriculum design	2
3.	Staff	3
4.	Material resources	3
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	2
	Total:	15

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

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

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

4 (very good) - the field is exceptionally good.

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