



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus Gedimino technikos universiteto
STUDIJŲ PROGRAMOS *KELIŲ IR GELEŽINKELIŲ INŽINERIJA*
(valstybinis kodas – 612H22001)
VERTINIMO IŠVADOS

EVALUATION REPORT of
ROAD AND RAILWAY ENGINEERING
STUDY PROGRAMME (*state code – 612H22001*)
at Vilnius Gediminas technical university

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Išvados parengtos anglų kalba
Report language – English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Kelių ir geležinkelių inžinerija</i>
Valstybinis kodas	612H22001
Studijų sritis	Technologijos mokslai
Studijų kryptis	Statybos inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4), iššęstinė (6)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Statybos inžinerijos bakalauras
Studijų programos įregistravimo data	1997/05/19

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Road and Railway Engineering</i>
State code	612H22001
Study area	Technological Sciences
Study field	Civil Engineering
Type of the study programme	University studies
Study cycle	First
Study mode (length in years)	Full-time (4), part-time (6)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Construction Engineering
Date of registration of the study programme	19/05/1997

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I. INTRODUCTION

1.1. Background of the evaluation process

The evaluation of on-going study programmes is based on the **Methodology for evaluation of Higher Education study programmes**, approved by Order No 1-01-162 of 20 December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC).

The evaluation is intended to help higher education institutions to constantly improve their study programmes and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: 1) *self-evaluation and self-evaluation report prepared by Higher Education Institution (hereafter – HEI)*; 2) *visit of the review team at the higher education institution*; 3) *production of the evaluation report by the review team and its publication*; 4) *follow-up activities*.

On the basis of external evaluation report of the study programme SKVC takes a decision to accredit study programme either for 6 years or for 3 years. If the programme evaluation is negative such a programme is not accredited.

The programme is **accredited for 6 years** if all evaluation areas are evaluated as “very good” (4 points) or “good” (3 points).

The programme is **accredited for 3 years** if none of the areas was evaluated as “unsatisfactory” (1 point) and at least one evaluation area was evaluated as “satisfactory” (2 points).

The programme is **not accredited** if at least one of evaluation areas was evaluated as "unsatisfactory" (1 point).

1.2. General

The Application documentation submitted by the HEI follows the outline recommended by the SKVC. Along with the self-evaluation report and annexes, the following additional documents have been provided by the HEI before, during and/or after the site-visit:

No.	Name of the document
1	Lectures review schedule approved on 2016-02-19 by the Dean of the Faculty of Environmental Engineering

1.3. Background of the HEI/Faculty/Study field/ Additional information

This evaluation report is based on the Self-evaluation report submitted by Vilnius Gediminas Technical University (hereafter VGTU) and a visit to the university by the review team on 1st December 2016, during which relevant facilities were inspected, the students’ term and

course papers along with some examination material were briefly reviewed, and discussions were held with the following groups:

- senior management and faculty administration,
- staff responsible for the preparation of SER,
- teaching staff of the study programme,
- students of the study programme,
- alumni and social partners.

VGTU is a state institution of higher education and research, one of the largest higher-education institutions in Lithuania. Its aim is to become leader in scientific engineering education and research in Lithuania.

There are nine faculties and one institute, all but one dealing with engineering, and a Faculty of Business Management. Three faculties offer programmes related to Civil Engineering: the Faculty of Environmental Engineering, the Faculty of Transport Engineering and the Faculty of Civil Engineering. The Road and Railway Engineering programme is conducted by the Faculty of Environmental Engineering. According to the management interviewed, the Faculty of Architecture is the oldest and most important faculty to train architects in Lithuania. The Faculty of Civil Engineering is the oldest of VGTU and focuses on Civil Engineering, while the Faculty of Environmental Engineering is focussed on urban construction. The panel inquired about the relationship of the various faculties to each other, particularly with regard to the overlap of study fields. They are told that the current structure has historical reasons and that there may be changes in the future. The faculty of Civil Engineering has already halved the number of departments, and the Faculty of Environmental Engineering will only keep two departments related to Civil Engineering.

The *Road and Railway Engineering* programme is an undergraduate programme with 240 credits, leading to the degree of Bachelor of Construction Engineering. It is offered in full-time and part-time mode, with study durations of four years and six years, respectively. The teaching language is Lithuanian. Additionally, a levelling course is offered for graduates of other institutions (colleges). The programme was implemented in 1997 and underwent its first external assessment in 2011. Various recommendations were then given, which the faculty has carried out. The graduates of the programme have been employed in various institutions, primarily in the field of their study. The proportion of graduates proceeding further to Master studies is not exactly known, since there is no master course matching the specialisation.

1.4. The Review Team

The review team was completed according *Description of experts' recruitment*, approved by order No. 1-01-151 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on *1st December 2016*.

1. **Prof. dr. Haldor Jochim (team leader)**, *Professor of Railway and Transport Planning, FH Aachen University of Applied Sciences, Germany.*
2. **Prof dr. Miroslav Premrov**, *Dean of Faculty of Civil Engineering, Transportation Engineering and Architecture, University of Maribor, Slovenia.*
3. **Assoc. Prof. dr. Tone Merete Muthanna**, *Associate Professor of Hydraulic and Environmental Engineering Dep., Norwegian University of Science and Technology, Trondheim, Norway.*
4. **Assoc. Prof. dr. Jelke Dijkstra**, *Associate Professor of Civil and Environmental Engineering Dep., Chalmers University of Technology, Sweden.*
5. **Dr. Dalė Daunoravičiūtė**, *Quality Manager at the public institution "Technical supervision services", Independent Consultant, Lithuania.*
6. **Ignas Gaižiūnas**, *Bachelor student in Energy Physics, Vilnius University, Lithuania.*

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The programme's aim is to prepare Bachelors of Road and Railway Engineering, which are "able to manage and understand the technological processes [...], make their own decisions based on the engineering logic and quickly understand new materials and technology. [...] Undergraduates should also be ready for the professional activities of design, construction and operation in enterprises" (p.7 SER). For evidence the panel studied the course descriptions as well as exam and final papers and interviewed alumni and social partners. The results are presented in the following paragraphs.

The university has defined five fields of skills and competencies: application of knowledge, research competencies, special skills and competencies, social skills and competencies, personal skills and competencies. 24 sub-competencies are assigned to those fields, ranging from *Knowledge of fundamental sciences, nature and its phenomenons* to the capability of communicating *in correct written and oral Lithuanian language, [...] foreign languages, [...] using the modern technologies of information [...], and labour skills in teams of [...] specialists (SER, Annex 8.1, Tables 1 and 3a).*

The definition of competencies in the tables does however not match completely the description on p.7 (paragraph 11) of the SER (*understanding, analysis and solution of problems, designing building structures, application of modern technologies and construction materials in building and maintenance, comprehension of safe traffic problems, analysis and application of appropriate measures of engineering safety improvement, appropriate organisation of traffic and usage of modern information technologies, independent performance of works, decision-making and further independent development*). Neither does the description on p. 7 match the descriptions of either the old or the new versions in Annex 8.1 (*Knowledge and its application, research competencies, special skills and competencies, social skills and competencies, personal skills and competencies and knowledge, skill to research, engineering analysis, engineering design, skills of engineering activity, personal and social skills*, respectively). According to the management, the descriptions had to be updated several times following state guidelines. From the view of the panel that does not really explain why all descriptions vary. There rather seems to be an issue with the organisation of the writing of the SER or even with the seriousness of their use in the faculty (see Chapter 2.6).

The link to the VGTU website given on p.7 of the SER is wrong, but with the correct link public accessibility is provided.

On p.8 of the SER, it is maintained that „study results are in line with the study objectives and purpose“. That statement is equivalent to the requirement that „the programme aims and learning outcomes are based on the academic and/or professional requirements, public needs and the needs of the labour market“. As evidence the faculty cites the fact that 80% of graduates occupy positions related to their study field and recommendations by companies. During the site visit this was confirmed by the graduates interviewed and can thus be corroborated on a general, non-detailed level. There is, however, cause for criticism in some details, which will be referred to in Chapter 2.2.

The faculty maintains that there is a major distinction from similar programmes in Road/Railway Engineering offered by other institutions. Asked by the peers what the differences to other programmes were, the management explained that there are no other programmes providing Road and Railway Engineering on university level in Lithuania. The employers agree that there is high demand of road and railway planners and designers in Lithuania, which the universities and colleges can hardly fulfil.

The title of the programme, its aims and objectives and the associated learning outcomes are compatible with each other and with the qualification offered as far as Road Engineering is concerned, with the exception of some areas to be mentioned in Chapter 2.2.

As to the professional activities of the graduates, the SER states that, according to a survey undertaken, more than 80 per cent of graduates occupy positions related to their study subject and only 1 per cent are unemployed after one year. That can be taken as evidence for the programme fulfilling its objectives as to “the professional activities of design, construction and operation in enterprises” (cf. the first paragraph).

2.2. Curriculum design

The structure of curriculum conforms to the ECTS system, meets legal requirements and the programme fully complies with the General Requirements of Lithuanian regulations for Higher Education. The total workload of 240 ECTS is allocated nearly equally among 8 semesters for the full-time study programme. In the part-time programme the workload is spread over 12 semesters. Each of 8 semesters includes no more than 7 study subjects, which means that formal regulations are met. The Bachelor thesis is split in three parts (3+5+7 ECTS) in two consecutive semesters. Compulsory general-education subjects such as languages, Business and Law have 15 ECTS in total.

The course proceeds from general subjects such as natural sciences, mathematics and mechanics in the first two semesters, to general civil-engineering modules in the semesters 3 and 4. The subjects dealing with the actual Road and Railway Engineering are mainly concentrated in the semesters 5 to 8.

Further analysis of the curriculum shows that the 240 credits the full-time course provides are distributed in the following manner:

- 15 for Generic competences
- 129 for non-transport subjects (foundations and general civil engineering)
- 66 for transport-related subjects
- 15 for Industrial Practice (transport-related)
- 15 for the Bachelor thesis (transport-related)

Of the 240 credits, 96 (66+15+15), i.e. 40 per cent are related to transport. With such a distribution one would expect this course to be a specialisation of Civil Engineering. For a programme called, Road and Railway Engineering⁶ the share of transport-related subjects is just acceptable.

Of the 66 credits for transport-related subjects (excluding the Bachelor thesis), only 18 credits are directly related to railway engineering. Not taking into account Industrial Practice and the Bachelor thesis, just 7.5 per cent of the curriculum deals with railway engineering. Even if

students choose their Industrial Practice and their Bachelor thesis from railway engineering, they can lift this number only to a maximum of 20 per cent of all credits. Considering that the title “Road and Railway Engineering” suggests at least an approximate balance between road and railway topics, the share of rail is obviously too small. Some students also confirmed that view.

The figures for the extended part-time course differ slightly from those of the full-time course, without contradicting the general conclusion.

The students interviewed doubted whether the internship done in the second semester is useful, because it is very early in the course and the students are not capable of really doing useful engineering work at this stage. The faculty might review this element in the curriculum. The students also criticised the number of papers to write in the 5th semester and about the non-transport related contents of the Law module. The panel are aware of the bias in the students’, it might, however, be useful to look into these matters.

Reviewing the study plan, the peers have some doubt about the logical order of subjects. They find that Reinforced Concrete is taught one semester before Structural Mechanics is fully completed; in their view it is difficult to imagine how this can be accomplished successfully. The panel also wonder why Metal Bridges are dedicated a module in the same semester as Structural Mechanics and in what respect Metal Bridges is an important subject for Road and Railway Planners. The course card unfortunately does not present learning outcomes or contents of that module. Arguably, the Transport Structures module might also be sensibly placed before the application modules of design, construction and maintenance of roads and railways. The teachers indicate that in some cases this might be an issue of naming the modules appropriately; in this case, the naming should be made to match the contents and learning outcomes.

Analysing coursework and Bachelor theses, the peers found that the technical quality of the papers is high. Still, they criticised the focus on software solutions. The papers tended to cover only problems that could be solved with the software available. Since the Civil 3D software used does not provide complete design solutions for either roads or railways (e.g. design and alignment of turnouts are entirely missing), some specialities do not appear in any coursework or thesis. That criticism is in line with statements from some employers, who do not find sufficient planning and design skills among the graduates and would favour a broader approach including basic skills in manual drawing.

On inquiry, the panel were told that a new software, Bentley, is being introduced to alleviate that deficit. The panel did some research about Bentley and found that, due to its advanced features, it seems somewhat over-engineered for use in teaching. If it is used, it will be even more vital to

teach the students the basic concepts of road and rail design rather than the technical software application.

With the qualifications mentioned above, the programme provides students with an adequate background in general Civil Engineering and prepares those who may want to continue for their studies at post graduate level. It is, however, unclear which master course they can proceed to, since Road or Railway Engineering are not offered on a Masters level at VGTU or other universities in Lithuania. The students also regretted that there are no such courses on offer. The employers interviewed also unequivocally favoured such a course and pledged to support the students they have already employed.

Overall, the scope of the programme provides the breadth and the depth needed to achieve the learning outcomes of an engineering programme, though there are some deficits as to the scope and depth of the specialist subjects. The latest achievements in science and technologies are taken into account as to the availability of modern software products. As the numbers of credits for Road and, especially, Railway Engineering are moderate to small, it will, however, not be easy to teach and foster creative thinking.

2.3. Teaching staff

The composition of the teaching staff on the programme fully complies with the requirements set by Lithuanian regulations for first-cycle study programmes, i.e. more than half of the study field subjects (66%) are taught by teachers who have a PhD, according to p.13 SER. The total number of teachers is difficult to assess from the SER, as it lists all 171 lecturers from 32 departments who have delivered lectures in the programme (p.13 SER). The teacher-student ratio given in the SER follows official guidelines but does not take into account that lecturers teach in several courses simultaneously and some teachers work in other jobs as well. The ratio calculated is therefore not meaningful. Instead, the peers used the interviews with SER authors and teachers to gain insight into the adequacy of the numbers of lecturers. Research of the module descriptions while taking into account the rather high teaching load of the lecturers shows that the programme is supported by an adequate number of teachers, both academics and guest lecturers from companies such as Lithuanian Railways, to deliver the intended learning outcomes. One important qualification of that statement affects the staff for Railway Engineering. It is sufficient for delivering the current teaching. If, however, the teaching of Railway Engineering is extended, as is proposed in this report, staff will have to be increased accordingly.

Overall, the composition of the staff fulfils the requirements, as academic experience varies between 2 years and 49 years, showing a huge spectre and a fairly balanced distribution (Annex

8.2). A fair number of teachers also have practical work experience in the fields that suit the programme's disciplines. It also seems that teaching staff also provides a rich variety of ages, academic and contextual backgrounds.

Outgoing lecturers dominate incoming ones by a large margin. The interchange of the academic staff in the programme is shown in Table 10 of Annex 8.2 of SER.

According to the statements in the SER, the main focus of teacher qualification lies on professional and scientific qualification. This is provided by strong encouragement of publications, attendance of scientific conferences and company internships. There are roughly 200 publications each year authored by members of the faculty staff (Annex 8.2 Table 7 SER), which is a high figure, even if one takes into account the varying importance of the media where they were published (such as conference proceedings vs refereed journals). The list of publications appears to prove a high commitment for research; the titles of the publications show a strong relationship to the study course.

Pedagogical and didactic qualifications are not explicitly mentioned in the SER, except for the statement that lecturers are assessed by other lecturers and the results are discussed in faculty meetings.

2.4. Facilities and learning resources

The SER provides overall figures for material resources in terms of premise area and classroom places. It also mentions the availability of computers and printers for students. The site visit also suggested that the classroom situation is sufficient. In addition, the quality of the library was evaluated by the panel. From the SER it had been known that it is among the most modern in Lithuania, with long opening hours, owning paper as well as electronic literature and providing students with workplaces as well as books to take home for study. For research, there is a modern electronic search system linking several Lithuanian libraries. The reading room visited by the panel is fairly small, but there are more reading rooms in other buildings, so that the library facilities appear to be satisfactory. The computer rooms are adequately equipped and available. The department plans to increase the share of foreign literature in the library, mainly in English and German, which is regarded as useful by the peers too.

The equipment of the road laboratory is satisfactory for road construction engineering. However, there is no railway laboratory. Considering the high cost of a proper railway laboratory the peers do not demand that one be erected, but expect suitable ways of replacing the competences in other ways, such as field trips and visits to other laboratories in Lithuania, for instance the laboratories of *Vilnius College of Technologies and Design* and Lithuanian Railways company.

Teachers and students maintained that what is taking place is sufficient for the competences to be acquired. As this could not be checked objectively, this assertion has been accepted by the peers; still, they believe that this is a point to be checked in more detail at the next reaccreditation.

The department currently uses the *Civil 3D* software for road and railway design. As this software does not offer a full variety of design solutions, the department has now acquired the Bentley software. The scope of this software is more than sufficient for the purposes of this course. The department should develop a consistent strategy on how to use this software in teaching, as not to be overwhelmed by its many facilities.

2.5. Study process and students' performance assessment

Admission requirements are set following the admission procedure approved by Association of Lithuanian Higher Education Institutions for joint admission organisation (LAMA BPO) and are appropriate for the type and orientation of the study programme. Admission to the programme follows a specific competitive-score system, which weights the grades in core subjects of mathematics, natural sciences and language/literature and thus derives a competitive score for applicants. The number of students admitted in the programme has been changing since the introduction of the programme, with a general downward trend, from 68 students in 2011 to 29 students in 2015. The main reasons for these changes are demographics. The competitive score went down in accordance with the lower numbers of applicants, from 14.75 to 5.13. In 2011 and 2015, all applicants were admitted, whereas between 2012 and 2014 between 14% and 39% of applicants were rejected. Only three students were admitted for part-time study in 2015, which will make it necessary to consider the future design or even the existence of this course. The department tries to display information through its website and open days.

The university offers the programme in three variations: full time, part time and as a part-time levelling course for graduates from other higher-education institutions. Whereas the part-time programme lacks students, the intake of the levelling course is fairly constant with roughly 25 students each year, all state-funded. As the SER does not give information about details of these students and none of them were present at the site visit, the management were inquired about them. The peers were told that they mainly come from *Vilnius College of Technologies and Design* and acquire additional competences to have the chance to get more senior positions in Road or Railway Engineering or to proceed further to Master studies. They are offered a part-time course because most or all of them are in jobs and do not attend the same classes as the students of the other courses. It is strongly recommended that the department provides more information about these students for the next reaccreditation to come. Particularly,

- where those students come from,
- what competences they are missing,
- what modules they usually have to undergo,
- how they are integrated into the timetable of the other courses (or are they not?) and
- whether and how they interact with the students of the other courses

should be made more transparent.

In the years 2011, 2012 and 2015 all or nearly all of the students were state-funded. In the years 2013 and 2014 only 87 out of 138 state-funded places in the full-time and part-time programme (in those two years combined) were taken; in the year 2015 the number of state-funded positions was reduced to 34 per year, 32 of which were filled (Tables 6.2 to 6.4 SER).

The management maintains that joint courses with civil-engineering students of the full-time or part-time programme were not feasible due to a differing subject focus. From the peers' point of view that is a major point for criticism. It means that three modes of the programme sharing similar contents are organised as three distinct courses, thus preventing the students from meeting each other and the teachers from teaching in a more efficient way. The panel recommend joint classes wherever possible. These would improve the economies of scale and thus support the sustainability of the course.

From a contents-based point of view, the blend of academics and practitioners in the teaching staff, including the involvement of specialists as guest lecturers, is positive. More participation of foreign professors would however be welcome; the efforts the department has been undertaking are appreciated by the panel.

Unfortunately, there are gaps in the provision of certain subjects and in the scope of the theses, as mentioned in Chapter 2.2. students' performance in critical and creative thinking cannot be measured adequately as the focus appears to be on the skill in using software products. Since these problems cannot be remedied just by reforming certain details in the curriculum but require a reform of the approach to the teaching of engineering, thus affecting the study process negatively.

The SER cites the number of non-graduated students in relation to admitted students (41 to 103 and 32 to 109 for two respective cohorts); these numbers can be taken as proxy for the dropout rate, rendering them to be between 30 and 40 per cent. The SER explains this phenomenon with students being ill-informed about their study decisions, thus terminating their courses early and going to other courses (p.23 SER). The management of the course seems to regard this as a nation-wide problem they cannot influence.

Participation of students in research does not seem a great issue, as the focus of this Bachelor programme lies in practical work, in which the students participate intensively through internships, coursework and their final theses.

On average about 4 students each year go abroad using the ERASMUS scheme. Compared with all students, that is between 5 and 10 per cent. Taking into account that students in the levelling course may have other priorities than going abroad this appears just adequate, though it could potentially be still higher.

Support for the students within their studies is provided by counselling hours. They take place face-to-face as well as by various means of on-line communication, according to a schedule set up for each semester. The faculty also provides individual study programmes for students with special needs. The Club of Young Road Engineers organised by the students themselves helps them keep social contact with each other and also with the university and employers. The Integration and Career Office of the university helps students find jobs, manage connections etc. As the Office is not staffed with specific (road/railway industry) expertise its effect is moderate. The students confirm that they usually find jobs without its assistance.

Social support is provided by the scholarships given to state-financed study places. Additionally, there are scholarships for taking part in several social and ERASMUS activities as well as special scholarships for disabled students. Rooms in dormitories are provided for full-time students.

The SER explains the general setup of the assessment scheme. There is a mixture of continuous assessment and assessment by exams. The variety of assessment and exam methods is explained in the course descriptions. The students interviewed show some acquaintance with course descriptions, which means they have access to them. After the exams, students have the opportunity to give their opinions about each module. There is a feedback loop to the faculty with the aim to assess the teaching quality. Neither in the SER nor during the interviews it became entirely clear whether the feedback is individual or collective and whether there is also regular feedback to the students themselves, which is another source of criticism as to the process.

2.6. Programme management

At programme level a management structure is in place with allocation of duties and responsibilities. At the faculty level, the Study Programme Committee ensures the alignment of the programme's aims and objectives to the VGTU strategy. The issues related to the course organisation are the responsibility of the Studies Committee.

According to the interviews held during the site visit all programme stakeholders – teachers, students, and social partners are represented in the Committees.

The SER lacks specific information about how the programme management loop is structured, from the gathering of data to their processing and interpretation. Rather, it is specific about the actions taken for quality control:

- Evaluation of lessons and teachers by students, peers and the vice-dean,
- Discussions between the heads of departments and students about modules and teachers,
- Control of teaching quality, theses and projects by the heads of departments,
- Surveys of professional practice.

From this, one question remained: How do teaching staff and heads of departments assess the quality of their peers' lectures and what qualifies them to do that? During the site visit the panel interviewed the faculty management about this and were told that an Evaluation Centre was opened recently to provide mentoring for the teachers, so that pedagogical quality will be secured.

The QA system presented in the SER and evaluated on site is functional at an intermediate level. However, it needs to be further developed to establish a closed loop, from acquiring structured information, its adequate processing; proper dissemination among all stakeholders, to structured action with clear distribution of responsibilities and strategic planning, finally to an action plan of how to make the improvements, which effectiveness and efficiency needs to be constantly monitored. Consultation of quality experts might be useful.

As referred to in Chapter 2.1, the descriptions of the learning outcomes in the various documents do not match. From the view of the panel the change of state guidelines does not really explain why all descriptions vary. There rather seems to be an issue with the organisation of the writing of the SER or even with the seriousness of their use in the faculty. Other points of criticism are: information on the levelling course in the SER is spurious, the subject description were only delivered after the request from the panel and the list of teachers just lists all teachers who have ever taught in the programme, rather than those who currently teach.

III. RECOMMENDATIONS

1.

The panel recommend using the internationally common degree of ‘Civil Engineering’ in the English translation, to avoid confusion of Construction Engineering with Structural Engineering.

2.

It is strongly recommended that the share of transport-related topics, especially rail, in the curriculum should be increased. For this to be achieved, railway-engineering staff, but perhaps also road-engineering staff, will have to be recruited. If the share of rail is not increased it will be difficult to maintain the title of the programme.

3.

There should be greater emphasis on teaching the basic concepts of road and rail design rather than mainly technical skilfulness of using software applications. That refers to the details of the curriculum as well as the organisation of the study process.

4.

The study plan and course descriptions should be reviewed with the aim of identifying possible inconsistencies across the course of study, either in the contents and learning outcomes or the labelling.

5.

Joint classes of the three parallel courses run by the faculty wherever possible are recommended. They would improve the economies of scale and thus support the sustainability of the course.

6.

The QA system is functional at an intermediate level. However, it needs to be developed further to establish closed loops and constant monitoring that leads to worthwhile programme improvements. Special focus should be laid on the information contents of the self-report.

IV. SUMMARY

Road and Railway Engineering is the only university-level study programme focusing on Road/Railway Engineering in Lithuania and thus unique. Its graduates are keenly sought after by employers. That offers the programme a great advantage to other programmes which have to face stronger competition.

The title of the programme, its aims and objectives and the associated learning outcomes seem to be compatible with each other and with the qualification offered as far as Road Engineering is concerned. For a programme called “Road and Railway Engineering” the share of transport-related subjects is, however, just acceptable. Considering that the title suggests at least an approximate balance between road and railway topics, the share of rail is obviously too small.

Reviewing the study plan, the peers have some doubt about the logical order of some subjects. Maybe this is caused by unclear labelling, but it needs to be addressed.

There is a strong focus in teaching on the technical use of software products. The problem with this is that the basic concepts of road and rail may be somewhat neglected, so that students might not be well-prepared to solve problems that require creative thinking rather than chiefly competent computer-aided design. Remedying this deficit will involve reforms of the curriculum and the study process.

Only three students were admitted for part-time study in 2015, which will make it necessary to consider the future design or even the continuation of this course. The part-time course and the part-time levelling course offered for graduates from other higher-education institutions should be integrated into the full-time course as far as possible; this will improve the economies of scale of the courses and the social contacts between the students of all three courses.

Research of the module descriptions while taking into account the rather high teaching load of the lecturers shows that the programme is supported by an adequate number of teachers, both academics and guest lecturers from companies such as Lithuanian Railways, to deliver the intended learning outcomes. If, however, railway engineering is to get a higher importance, the number of teaching staff for this area will have to be increased.

The equipment of the road laboratory is satisfactory for road construction engineering. As to railways, field trips and visits to other laboratories in Lithuania, for instance the laboratories of *Vilnius College of Technologies and Design* and Lithuanian Railways, may be sufficient to replace a laboratory.

The Quality Assessment (QA) system presented in the SER and evaluated on site and needs to be further developed to establish a closed loop, from acquiring structured information, its adequate processing, proper dissemination among all stakeholders, to structured action with clear

distribution of responsibilities and strategic planning and finally to an action plan of how to make the improvements.

Special focus should be laid on the information contents of the self-report.

The effectiveness and efficiency of the QA needs to be constantly monitored. For the latter the consultation of quality experts might be useful.

V. GENERAL ASSESSMENT

The study programme *Road and Railway Engineering* (state code – 612H22001) at Vilnius Gediminas technical University is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	2
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	2
6.	Programme management	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.

Grupės vadovas:

Team leader:

Prof. dr. Haldor Jochim

Grupės nariai:

Team members:

Prof. dr. Miroslav Premrov

Assoc. Prof. dr. Tone Merete Muthanna

Assoc. Prof. dr. Jelke Dijkstra

Dr. Dalė Daunoravičiūtė

Ignas Gaižiūnas

**VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETO PIRMOSIOS PAKOPOS
STUDIJŲ PROGRAMOS *KELIŲ IR GELEŽINKELIŲ INŽINERIJA* (VALSTYBINIS
KODAS – 612H22001) 2017-03-15 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-54
IŠRAŠAS**

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus Gedimino technikos universiteto studijų programa *Kelių ir geležinkelių inžinerija* (valstybinis kodas – 612H22001) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	2
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	2
6.	Programos vadyba	2
	Iš viso:	15

* 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

Kelių ir geležinkelių inžinerija yra vienintelė universitetinė šios srities studijų programa Lietuvoje, todėl ji unikali. Studijų programos absolventai itin paklausūs tarp darbdavių. Tai suteikia programai didelį pranašumą prieš kitas studijų programas, kurios susiduria su didesne konkurencija.

Programos pavadinimas, tikslai ir uždaviniai bei susiję studijų rezultatai dera tarpusavyje ir su teikiama kvalifikacija, kiek tai susiję su kelių inžinerija. Tačiau studijų programai, kuri vadinasi *Kelių ir geležinkelių inžinerija*, su transportu susijusių dalykų dalis yra vos priimtina. Sprendžiant iš pavadinimo, turėtų būti daugmaž panašus kelių ir geležinkelių temų santykis, tačiau geležinkelių tematikos dalis akivaizdžiai per maža.

Peržvelgę studijų planą, ekspertai abejoja dėl kai kurių dalykų loginio eiliškumo. Taip gali atrodyti dėl neaiškių dalykų pavadinimų, tačiau šį klausimą reikia spręsti.

Dėstant labai akcentuojamas techninis programinės įrangos naudojimas. Tačiau atsiranda problema, kad kartais gali būti nepaisoma pagrindinių kelių ir geležinkelių sąvokų, todėl studentai gali būti nepakankamai pasiruošę spręsti uždavinius, reikalaujančius kūrybinio mąstymo, o ne vien tik projektavimo kompiuteriu išmanymo. Norint ištaisyti šį trūkumą, reikia pertvarkyti programos sandaros ir studijų eigos aspektus.

2015 m. į ištęstines studijas buvo priimti tik trys studentai, todėl reikės peržiūrėti šios programos formos sandaros ar netgi studijų programos testavimo ateityje klausimus. Šios programos ištęstinių studijų forma ir ištęstinių lyginamųjų studijų forma, siūloma kitų aukštųjų

mokyklų absolventams, turėtų būti kiek įmanoma labiau integruotos į nuolatinę studijų formą. Tai pagerintų studijų programos masto ekonomiją ir socialinius ryšius tarp visų trijų formų studentų.

Panagrinėjus modulių aprašus ir atsizvelgiant į gana didelį dėstytojų darbo krūvį, matyti, kad programos dėstytojų – tiek akademikų, tiek kviestinių dėstytojų iš tokių įmonių kaip „Lietuvos geležinkeliai“ – skaičius pakankamas numatomiems studijų rezultatams užtikrinti. Jei vis dėlto geležinkelių inžinerijai bus teikiama didesnė svarba, reikės didinti šios srities dėstytojų skaičių.

Kelių laboratorijos įranga yra tinkama kelių statybos inžinerijai. Kalbant apie geležinkelius, pažintinių išvykų ir vizitų į kitas laboratorijas Lietuvoje, pavyzdžiui, *Vilniaus technologijų ir dizaino kolegijos* ir „Lietuvos geležinkelių“ laboratorijas, gali pakakti vietoj nuosavos laboratorijos.

Kokybės užtikrinimo sistema, pateikiama savianalizės suvestinėje ir įvertintą vizito į universitetą metu, reikia toliau tobulinti uždarančią kokybės ciklą – nuo struktūruotos informacijos gavimo, tinkamo jos apdorojimo ir sklaidos visiems socialiniams dalininkams iki susistemintų veiksmų, aiškiai paskirstant atsakomybę, strategiškai planuojant, ir galiausiai iki veiksmų plano, kaip įgyvendinti patobulinimus.

Reikėtų atkreipti ypatingą dėmesį į savianalizės suvestinės informacijos turinį. Kokybės užtikrinimo veiksmingumas ir efektyvumas turi būti nuolatos stebimi. Tam gali praversti kokybės ekspertų konsultacijos.

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III. REKOMENDACIJOS

1. Ekspertų grupė rekomenduoja vertime į anglų kalbą naudoti tarptautiniu mastu įprastą laipsnio pavadinimą „Civil Engineering“, norint išvengti statybos inžinerijos painiojimo su struktūrine inžinerija.
2. Labai rekomenduojama studijų programos turinyje didinti su transportu, ypač geležinkeliais, susijusių temų dalį. Norint tą pasiekti, reikės samdyti geležinkelių inžinerijos srities ir galbūt kelių inžinerijos srities dėstytojus. Nedidinant su geležinkeliais susijusios dalies, bus sunku išlaikyti studijų programos pavadinimą.
3. Reikėtų labiau akcentuoti pagrindinių kelių ir geležinkelių projektavimo sąvokų dėstymą, o ne daugiausia lavinti techninius programinės įrangos naudojimo įgūdžius. Tai liečia ne tik programos turinį, bet ir studijų eigos organizavimą.
4. Reikėtų peržiūrėti studijų planą ir dalykų aprašus, siekiant nustatyti galimą studijų dalykų nesuderinamumą – turinio ir studijų rezultatų arba pavadinimų atžvilgiu.
5. Rekomenduojama kur įmanoma dėstyti fakulteto vykdomų trijų studijų programos formų bendrąsias paskaitas. Tai pagerintų masto ekonomiją ir palaikytų studijų programos tvarumą.
6. Kokybės užtikrinimo sistema veikia vidutiniškai. Todėl ją reikia toliau tobulinti, siekiant uždaryti kokybės ciklą ir vykdyti nuolatinę stebėseną, padėsiančią vertingai pagerinti programą. Reikėtų atkreipti ypatingą dėmesį į savianalizės suvestinės informacijos turinį.

<...>

Paslaugos teikėjas patvirtina, jog yra susipažinęs su Lietuvos Respublikos baudžiamojo kodekso 235 straipsnio, numatančio atsakomybę už melagingą ar žinomai neteisingai atliktą vertimą, reikalavimais.

Vertējos rekvizītai (vardas, pavardē, parašas)