STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETO *TRANSPORTO INŽINERIJOS* (61203T110, 612E20001) STUDIJŲ PROGRAMOS VERTINIMO IŠVADOS

EVALUATION REPORT OF *TRANSPORT ENGINEERING* (61203T110, 612E20001) STUDY PROGRAMME at VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

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Išvados parengtos anglų kalba

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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	***Transporto inžinerija***
Valstybiniai kodai	61203T110, 612E20001
Studijų sritis	technologijos mokslai
Studijų kryptis	transporto inžinerija
Studijų programos rūšis	universitetinė
Studijų pakopa	pirmoji
Studijų forma (trukmė metais)	nuolatinė (4), ištęstinė (5)
Studijų programos apimtis kreditais[1]	168
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Transporto inžinerijos bakalauras
Studijų programos įregistravimo data	1997-05-19

[1] – vienas kreditas laikomas lygiu 40 studento darbo valandų

INFORMATION ON EVALUATED STUDY PROGRAMME

Name of the study programme	***Transport Engineering***
State code	61203T110, 612E20001
Study area	Technological sciences
Study field	Transport engineering
Kind of the study programme	University
Level of studies	First
Study mode (length in years)	Full-time (4), Part-time (5)
Scope of the study programme in national credits[1]	168
Degree and (or) professional qualifications awarded	Bachelor of Transport Engineering
Date of registration of the study programme	19-05-1997

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

CONTENTS

I. INTRODUCTION

The BSc programme 'Transport Engineering ' at the Vilnius Gediminas Technical University (VGTU) has been reviewed at the same time as the MSc programme "Transport Engineering" at the same University (VGTU). Vilnius Gediminas Technical University is a large well-established university with 8 faculties and 2 Institutes with Faculty rights.

Both the BSc and the MSc programmes are operated by the Faculty of Transport Engineering (founded in 1994), and the BSc programme has input from the Departments of Automobile Transport, Railway Transport, Transport Technological Equipment, and Transport Management. The Faculty also has the recently formed (2009) Traffic Safety centre. The Dean of the Faculty reports directly to the Rector of the University, and the Faculty Board is the supreme body of Faculty management.

The Transport Engineering (TE) BSc programme is offered in both full-time and part-time modes of study of duration full-time 4 years, part-time (evening and extramural) 5 years, and extramural "catch-up" studies 2.5 years. These represent 168 / 172 national credits (part-time evening and extramural studies), and 82 (part-time extramural catch-up studies). The programme language is Lithuanian. The BSc programme admits between 250 and 350 students in all 3 modes each year, although total admissions in 2010 fell to 180. It is the first part of a 3-cycle set of study programmes.

Other Cycle 1 Transport Engineering programmes exist in Lithuanian universities: Kaunas University of Technology (VGTU) offers a BSc in Vehicle Engineering with specializations in Automobile Maintenance and Management; Aviation Engineering; Railway Transport Engineering and Management; Railway Vehicle Engineering, Road Vehicle Engineering. The main difference between the two programmes is that the KTU programme focusses on production processes and technologies, including the technical maintenance of machinery, diagnostics, and safety; the priority is to educate a future manager / organizer. The VGTU study programme has the Transport Technological Equipment specialization which includes road building, maintenance, stevedoring machinery, gas stations and the construction of pipeline transport systems, together with their operation and technological processes.

The part-time evening and extramural studies are intended for working people to gain university education. The programme of part-time extramural "catch-up" studies is intended for college graduates (BSc) who wish to gain a university education; the student has to collect a minimum of 80 credits and "brings" 80 credits from the college. As the colleges focus more on practical training and less on the fundamental engineering subjects in their programmes, the part-time extramural catch-up studies focus more on the fundamental engineering subjects. Entry to the part-time extramural catch-up studies requires a BSc qualification and the speciality of Engineer in a defined set of colleges.

The BSc programme was registered in May 1997 and in 2005 external evaluation was carried out. The recommendations of that review were:

- To include electives in the programme: 3 electives are included in semesters 3, 5 and 6, totalling 8 credits. The students may choose either a module which is specified in the programme, or a module exceeding it by one credit from any study programme.
- To promote the participation of student self-government in the study process: The students are participating in the organization of the study process more actively. The students' representation appoints the curators of the first-year students from among the older students, their representatives participate in the meetings of the Faculty committee for academic affairs, Board, and certifying commission, present their proposals, carry out student surveys, and voice their opinions. Their activity depends on the participation and involvement of the students.

- To analyze the causes of dropout: the progress of students and the causes of dropout are analyzed after each session. There were found to be two main causes of dropout: either the student is not interested in the speciality, or has failed to pass. There also exist other causes; financial, family circumstances, lack of confidence, illness, etc. The highest dropout rates were found to be among first-year students and additional mathematics, physics, and chemistry lectures have been organized in the first semester for those who need them. These lectures are designed to assist students to achieve the general level, 1/3 of first-year students attend them and the evidence is that it really assists in reducing the dropout rates.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

1.1. Programme demand, purpose and aims

The Self-evaluation report includes a rationale for the BSc Transport Engineering programme based on the long-term (until 2025) strategy for Lithuanian transport system development (2005) which includes transport development, environment protection, improvement of traffic safety, and strengthening of administrative skills. To achieve this, more advanced technologies need to be introduced, more effective measures need to be implemented, and more qualified specialists are required. The mission of VGTU in this field, carried out by the Faculty of Transport Engineering, is to create, collect and disseminate scientific knowledge, educate specialists of highest qualification in the transport field, educate members of society, promote economic prosperity of the country, competitiveness of the economic activities, welfare, and high quality of life.

The objectives of the Transport Engineering study programme broadly align with this strategy; to provide students with the "level of university education allowing them to gain knowledge and develop skills that would enable them to work successfully in various positions related to the creation, development, safe operation, maintenance, and work organization of transport, machinery and equipment which require extensive education, creative thinking, ability to use high technologies, and act under global market conditions; to develop interest in the new scientific innovations in the studied field, be able to use this knowledge under various circumstances, understand the impact and importance of their decisions to the development of the society, to broaden the world view, to develop high expertise, creative and critical thinking; to be able to improve their professional competence through lifelong learning". It is broadly evident in the self-evaluation report and from the review meetings how these objectives are addressed by the indicated programme curriculum.

The BSc Transport Engineering programme has 3 pathways:

- Automobile Transport Engineering specializes in the field of maintenance, development, effective and safe operation of automobiles;
- Railway Transport Engineering specialises in the field of maintenance, repair, development and safe operation of railway rolling stock;
- Transport Technological Systems Engineering specialises in the field of road building, stevedoring machinery and equipment, maintenance, development, and effective and safe operation of technological equipment of pipeline transport.

The specific knowledge and understanding acquired in Cycle 1 Transport Engineering studies should include the following:

- Knowledge and understanding of transportation system structure, elements, and interrelations of elements, as well as knowledge and understanding of logistics;

- Knowledge and understanding of the construction and the functional principles of vehicles (transport means);
- Knowledge and understanding about the systems of the transportation system being studied, as well as knowledge and understanding about the trends of development of such systems, and peculiarities of use of means of transportation;
- Knowledge and understanding of transportation technologies and circumstances for optimum use of means of transportation;
- Knowledge and understanding of specific environmental and traffic safety problems.

The BSc programme as presented conforms to these statements in terms of the first cycle studies.

1.2. Learning outcomes of the programme

The learning objectives of the BSc TE programme are defined in the Self-evaluation report, and are "to prepare specialists who:

- *Have* higher university technical education, as well as knowledge and skills in the specialized subjects in the field etc…;
- *Are prepared* for activities in design and operation of land transport vehicles etc…. as well as to pursue further studies at the Master's level;
- *Know* the structure of the transport system, the interaction of its elements, logistics, etc….;
- *Are able* to determine and analyze characteristics of vehicles and technological equipment taking into account traffic, road and environmental conditions, etc…. "

These are comprehensive and well-formed.

The programme learning outcomes are presented as "learning attitudes" in Table 1 of Appendix 3.5 of the Self-evaluation report. These are quite well specified and are categorised under 4 areas:

- Knowledge (A);
- Cognitive skills (B);
- Practical skills (C);
- Transferred skills (D).

The learning outcomes / attitudes are not, however, included in the module descriptors which are insufficient.

The contribution made by each study module to the Programme level learning outcomes is defined on Table 2 of Appendix 3.5 of the Self-evaluation report. From this the contribution made by each study module to the Programme level learning outcomes is defined in terms of the Module learning outcomes.

The learning outcomes in Table 1 of Appendix 3.5 of the Self-evaluation report do not include sufficient evidence of three elements which the Reviewers considered to be important in a BSc (Cycle 1) programme. These are:

(i) Communications skills;

(ii) Critical review and evaluation;

(iii) Project planning and management.

The Reviewers believe that communication, in written and verbal form, should be explicitly included in 'Transferred skills' (D). This learning outcome would, for example, be addressed by

a language module, an ICT module, or by a module which involves teamwork (specified under D8).

The Reviewers would expect to see in Cycle 1 graduates an ability to critically review not only their own work, but that of others as well. This is alluded to in D4, but the Reviewers believe that the principles of critical review should be developed in all categories of learning outcomes (A) – (D). For example, learning outcome C7 might state "able to select rational combinations of machines....." which could be amended to include: "to be able to critically review them in order to make the selection". The Reviewers noted that this aspect was also generally under-represented in the Final Project reports.

Similarly, knowledge and understanding of project planning and management are not included in the learning outcomes.

Comments:

The Reviewers have noted that the programme aims and objectives are clearly identified and are mostly evident in the self-evaluation report and from the review meetings. The area of learning outcomes has been developed systematically and has distinctive features, but requires further refinement so that it becomes exceptionally good.

Recommendations:

The learning outcomes / attitudes should be included in the module descriptors.

More evidence of three important learning outcomes for a BSc (Cycle 1) programme is required:

(i) Communications skills in written and verbal form should be explicitly included in 'Transferred skills' (D).

(ii) The principles of critical review and evaluation should be developed in all categories of learning outcomes (A) – (D).

(iii) Knowledge and understanding of project planning and management should be specifically included in the learning outcomes.

2. Curriculum design

2.1. Programme structure

The study volume in hours and credits is adequate for Cycle 1 (BSc) degree study. The slight difference (168 vs. 172) between full-time and part-time is noted. The role of the "catch-up" studies was explained in the Reviewers' meeting with staff: this is for graduates from Applied Science universities (a) to get a university diploma (BSc) and (b) to enter the MSc (cycle 2) programme, although it was noted that this would also require additional credits for students wishing to enter the VGTU MSc from other departments' courses.

The BSc programme structure indicates that it is well defined: to provide knowledge in the basic subjects and then the students start to specialise. Optional and elective subjects are available. The programme is well structured and the range and selection of subjects (modules) are suitable to meet the objectives and comply with the legal requirements. The programme prepares graduates well for jobs, careers, and academic progression to 2nd cycle studies e.g. MSc, in VGTU or any other university in Lithuania or beyond!

The curriculum includes 12 credits for general subjects, 94 credits for basic subjects, and 62 credits for specialized subjects including 8 credits for electives and 10 credits for professional traineeships. There are 8 credits of Social Science (Economics, Management, and Law). Students can select a specialism in one of 4 areas ("Pathways"): Automobile Transport Engineering,

Railway Transport Engineering, Transport Technological Systems Engineering, and Transport Machinery and Equipment.

2.2. Programme content

The programme content appears to comply with the formal requirements and represents a very good 1st cycle part of an integrated 6 year study programme (BSc plus MSc). The curriculum is challenging and staff were enthusiastic about what they saw as the strengths of the programme, and when asked, listed a wide selection.

There is no defined project work except for the final degree project (and possibly some in the module Design of enterprises for automobile service); project work is usually where the development of project planning and management skills and knowledge is effectively based, and it (project planning and management) is not mentioned in the module descriptor.

It is not clear how much Teamwork practice is covered and it is not clear from the module descriptors how this important topic is developed through the semesters of the programme, and to what extent.

Nearly all modules specify a significant number of hours each week for practical lectures and laboratory work. The role of the social partners in providing practical placements is excellent, and is clear strong evidence of a healthy working partnership between Industry and the University at cycle 1 level.

The inclusion of Social Science subjects in the curriculum is commended as these 3 modules are very useful in a career in Transport Engineering. Specialist modules such as Finance of transport enterprises, Quality and reliability of vehicles, and Transport Management are available and these are important topics which could usefully be made available to all students. In addition, Maintenance theory is important in all branches of Vehicle Engineering, so a module in this topic should perhaps be considered. There is no specific mention of commercial vehicles, and consideration should be given to including some theory and practice of commercial vehicles (trucks and buses) in the curriculum. This should be easy because of the Transport Machinery and Equipment specialism.

Comments:

Overall the Reviewers considered that the area of curriculum design the area is exceptionally good. Although there was good evidence of project work and teamwork from the meetings between the Reviewers and the staff, students and graduates, this could be identified more clearly in the provided documents.

3. Staff

3.1. Staff composition and turnover

The number of staff that the Faculty employs in delivering the programme, and their research activities associated with the field of Transport Engineering were not clear prior to the Reviewers' visit and meetings as the staff profiles and research publications in the Self-evaluation report were not translated from the Lithuanian. The specialist subjects are taught by 9 professors, 30 associate professors, and 12 lecturers and assistants of the Faculty. Each of them is a specialist in his subject. Female staff were under-represented in the group the Reviewers met and the Faculty is encouraged to develop strategies to improve this.

3.2. Staff competence

The Self-evaluation report states that „The subjects of the Transport Engineering study programme are taught by the lecturers of 8 faculties and 23 departments. Almost all of the lecturers are full-time. The lectures of all three blocks are taught by experienced lecturers of high

qualification (see Table 3 in Appendix 3.5). They also conduct part of the tutorials, although tutorials and laboratory works are often entrusted to young lecturers since they also have to gain experience". The Reviewers met with members of the academic staff and this was broadly corroborated:

- Academic staff are highly qualified and experienced, and there are some younger staff in the Faculty whose careers are in the early stages of development;
- Some staff have practical experience related to the subjects they teach, outside the university;
- The Faculty encourages staff to work with industry;
- There are 8 Doctoral students in the automotive department (24 in the Faculty) who help with teaching of 'practical lectures' by supervising students.

Turnover of academic staff participating in the BSc (and MSc) programme appeared to take place mostly through progression from student to Professor. The majority of staff appeared to have completed their degrees at VGTU and have continued at VGTU on to an academic career. There did appear to be some staff who had joined the Faculty from a different background and the Reviewers observed that external refreshment of staff brings benefit to the Faculty. The Reviewers noted that the representation of female academic staff in the Department was very low to the point of being unsatisfactory, and recommend that this is addressed at Faculty level in planning for staff composition and turnover. There were no female lecturers in the group interviewed although the Reviewers were told that there are some female PhD students.

The level of international mobility of academic staff was relatively good (6 out of the 15 met by the Reviewers had been abroad in recent years). Even so, the Reviewers would wish to encourage staff to take more advantage of the opportunities offered by mobility schemes such as the Erasmus scheme.

The University encourages and rewards increased academic qualifications of the academic teaching staff. As a result staff qualifications are recognised as high and exceed the national requirements. All subjects in the programme are taught by professors or associate professors, some of whom have significant research achievements. Many research papers have been published by academic staff who are encouraged to publish in English (as this is the de facto international academic publication language) in order to bring their work to a global audience. More professional development in terms of international exposure and experience, and industrial experience, is encouraged, as is the improvement of staff English language skills.

Comments:

The Department's staff appear to have developed systematically over many years and have distinctive features including research achievement. Staff development in the areas of practical experience, international mobility, and English language capability would benefit the programme. The representation of female staff in the Faculty is low.

Recommendations:

Staff profiles and research publications should be translated from the Lithuanian for future self-evaluation reports.

The low representation of female academic staff in the Department should be addressed at Faculty level in planning for staff composition and turnover.

More mobility and external exposure for staff is encouraged. Staff should be encouraged to take greater advantage of the opportunities offered by mobility schemes such as the Erasmus scheme, and all staff should be encouraged to improve their English language skills.

4. Facilities and learning resources

4.1. Facilities

Premises for the studies of BSc students of Transport Engineering in Vilnius Gediminas Technical University are the same as for the MSc degree students and for the students of other programmes of the same Faculty. The number of students on the BSc course suggests that new premises are needed as soon as possible, especially for computer based teaching and laboratory work. The Self-evaluation report complains of the size and arrangement of the facilities, including noting that the Faculty is "divided into two parts which are located at 10 km from each other". The Reviewers only had time during the visit to see one part of the Faculty facilities.

Computer facilities (the Reviewers visited one) were good and well-equipped with modern computers. Computer Aided Engineering provision was excellent with important software for general mechanical engineering and transport engineering available (AutoCAD, SolidWorks, PC-Crash). The Reviewers would however like to encourage the staff and students to use these facilities more (there appeared to be practically no BSc final reports with serious models or calculation using these programs). Also the Reviewers would like to see some access provided to alternative equivalent software, e.g. to use also Inventor in comparison with SolidWorks, and also an alternative Finite Element analysis system (e.g. ANSYS, Nastran) for stress calculations or vibration analysis.

The engines laboratory is well equipped; there are different test stands to test engines, including more sophisticated modern ones such as a rolling road. The electrical machines laboratory was very interesting and up-to-date. Well prepared methodological information was available for the students. The mechanics of materials laboratory was not visited but was available in a different Faculty. So in general the laboratories and equipment are good.

The Faculty works with social partners to find practical placements for BSc students in companies From the conversation with students, staff, graduates and employers some BSc students went on to employment with the companies they did their practical placements at, which is very good. The students said that the BSc projects were quite practical and some were linked to industry projects. The Reviewers would like to encourage the staff to increase the number of final projects that are offered in collaboration with industry and social partners and include if possible some form of payment which will help and encourage students during their studies in university and subsequently in their employment.

4.2. Learning resources

The Faculty library (managed by staff of the Faculty) is small but the Reviewers learned that the main university library is much bigger, and contains a lot of applied technical literature in different languages. The opening hours are from 24 hours a day and 7 days a week which is very good. There is also good accessibility for the students to the 'e-library'. It contains books and periodical publications, including e.g. the professional magazine "Transport". Many of the publications and books are in other languages (English, German, Russian), and there were many books written by Faculty staff. Accessibility of various modern publications is good with an 'e-library' facility. The Reviewers would like to know if more books, textbooks and periodical publications in the field of Transport Engineering could be held in the Faculty library of instead of the main university library.

Learning materials are suitable and accessible but are more focused on railway and automotive engines. Since Transport Engineering involves a large range of various systems, the range of available learning materials should be wider, e.g. information about commercial vehicles, buses and pipeline transport. In general the learning materials are interesting and well prepared (especially in the field of railway engineering), and could be enhanced by preparing them in foreign languages which would help the Lithuanian students and make them acceptable and understandable for foreign students. This would open new possibilities to invite students from

abroad and also to have in the university prepared learning materials for foreign educational institutions.

Comments:

The area of facilities and resources has been developed systematically. Even though there are some issues with locations and premises, the BSc programme is reasonably well provided with premises, resources and equipment in comparison with universities elsewhere in Europe with the current level of student numbers.

Recommendations:

The need for new premises, especially for computer based teaching and laboratory work, should be investigated. Since there appear currently to be concerns over premises and facilities the Faculty and University should agree an action plan based on the outcomes of the review.

Staff and students should use the existing CAE facilities more, especially for the final projects.

5. Study process and student assessment

5.1. Student admission

Numbers of applications to the BSc courses full-time and part-time are given in Tables 2 and 3 of the part-time Self-evaluation report together with the numbers of admitted students. Student numbers are also given in Table 4 of the Self-evaluation report and the Reviewers asked for and were provided with student entry information for 2009 and 2010 entry during the visit. Full-time student numbers on the programme are 151 in the current year, which represents a serious decline (40%) over the last year (since 2009 entry). Part-time numbers have fallen to 2 from 18 in 2009 and 49 in 2008, while extramural student entry has fallen from 74 in 2008 to 27 in 2010. The Reviewers recommend that a strategic review to investigate and address this decline should be made with some urgency. They also noted that the staff did not seem particularly concerned about declining student numbers. Total numbers are not declining so fast, but there is still cause for concern as low intakes to year 1 start to filter through.

Students are invited to start their BSc studies on the VGTU TE programme directly from secondary school without any entrance examination. The admission grade is also not limited; it consists of national examinations of mathematics, physics and the Lithuanian language, as well as the grade average of a foreign language with leverage coefficients and calculated according to a certain formula. The candidates with the highest admission grades are admitted to a fixed number of places. In 2009 the grade of the last person invited to the state funded place was 9.96 (maximum – 21.80). The Self-evaluation report states that Transport Engineering is the most popular specialization between applicants but also it is clear that number of incoming students is declining dramatically so that the minimum grades accepted are quite low. Staff stated that this was a result of demographic change with decreasing numbers of students generally in the country, but in the Reviewers' opinion this is a problem that the staff have to address and it is also the problem of the University. So the Reviewers would like to encourage the staff to work more not only with present students but also with the stakeholders (and not only from the professional point of view but also from the human point of view).

Potential students are always interested to know about the possibilities of working during their studies. The Reviewers recommend that the staff should encourage part-time students and to help them find the possibility to work during the day with social partners.

The Reviewers considered that there is a good and clearly described system of admission but there is a problem of declining student admissions, and it is important to keep under control the minimum grade level for entry students and not to lower it too much.

The efficiency of enhancing the motivation of applicants and new students for BSc studies is very standard: Open Days, visits to secondary schools, and exhibitions. Also this year, a Young Engineers' School has been organized where lectures on the study programme have been given by Faculty lecturers. These activities are good but to increase the number of incoming students some new plan of action must be prepared as soon as possible and then new actions must be made.

5.2. Study process

The programme schedule is designed to accommodate the geographical situation of the university. Different departments of the university are located on two main sites which are about 10km apart. To reduce the amount of travelling from one to the other, lectures are planned one day at one site and the next day at the other. This is good but even so students have to do a lot of travelling. Full time students are scheduled with lectures and classes during the day. Duration of classes does not exceed 8 hours a day.

In the full-time Self-evaluation report it is stated that student dropout is up to 10% during the first year and another 10% are obliged to repeat the course. During the second year the situation is nearly the same. Total dropout in some years is even higher than 50%. Despite the assertions in the Self-evaluation report that the student dropout had been analysed and steps taken to reduce it, the evidence from the Table 4 is that there is a continuing dropout problem. Analysis of why students are dropping out from their studies is missing from the full-time Self-evaluation report but is given in the part-time Self-evaluation report. The part-time dropout analysis indicates that student dropout from the 3 part-time courses is also quite high. The main question is are the students thinking that the knowledge and skills they obtain during their BSc studies are not very useful in their future careers or maybe the employers don't need this knowledge? Or maybe students are admitted to study in this programme who are not able enough for such technical studies? Or maybe the minimum requirement for entrance should be increased? It is recommended that analysis is made which could help the staff to improve the present situation. Some actions to encourage and to motivate students to continue their studies until the end are needed.

The Reviewers met with students during their visit, and were very impressed with their abilities and attitudes. Representatives of the students, graduates and employers ("stakeholders") should be asked to contribute to the admissions review.

Mobility of lecturers is fairly good, mobility of BSc students looks low and there are no students coming from abroad which is possibly due to language (lectures are available only in Lithuanian). However, the students interviewed said that 3 (not clear if BSc or MSc) had been abroad under the mobility scheme, and 1 lecturer had visited during last year. The mobility of staff and of students is very important and helpful for the general improvement and widening of view of all people. Visits by foreign students and lecturers are also very helpful but not widely available. A reason might be that the staff need to improve their foreign language capabilities, and also need to encourage students to improve theirs. Students suggested that more language support in the programme would be helpful.

5.3. Student support

Very detailed information about the studies, schedules, employment possibilities and so on are available on university's web site. Administration and staff of the programme are available for the students by e-mail and they also can apply to the Dean's office throughout the working day. In generally situation is good enough to make information available for the students of BSc studies. There is a possibility to study according to the individual study programme, but it is used only in exceptional cases. Currently, there are no students studying according to the individual study programme. Several modes of studies are available: full-time, part-time evening and part-

time extramural studies. The contents of individual studies would have to meet the requirements of the Regulation and would in fact hardly differ from the official programme.

VGTU Study Regulations provide for the possibility to repeat the course, suspend the studies upon the student's request or due to an illness, but no longer than for two years and not more than twice and the total period of suspension of studies cannot exceed 3 years. The students have the possibility to get consultations and retake the examinations as required. This system looks very democratic and offers a lot of possibilities and chances for the students but in reality it doesn't appear to help to decrease the dropout rate.

The system of scholarships is quite good and understandable with priority related to the student's results each semester; the students are well aware of the arrangements and opportunities for scholarships. The amount of each scholarship is low but is related to the present financial situation in the country. Some students appear to have scholarships, but some of the students were paying full price of studies and some of them were paying part price. There is also a good system of state credits; as in many countries this system is used more and more and the Reviewers found it normal.

The number of hostels available for student accommodation appeared to be relatively low for the number of students in the university, and there is no information about the rate between price and quality of hostels. A lot of students come from remote towns and regions and at the beginning of the academic year all hostels are booked, but during the year some students seem to leave them to rent somewhere else. It is possible that the change of need for hostel accommodation during the year is related to student dropout and the need for students to minimise their costs.

5.4. Student achievement assessment

Assessment criteria are similar to other Lithuanian Universities. In the Reviewers' opinion the system is good and understandable for the students and lecturers. All results of assessment are published on the web. Students are allowed to be examined only if they completed all associated work. The final mark is equal to a sum of intermediate marks and their scope coefficient product. Students are permitted to be re-examined twice in the event that they failed during the session of examination.

Assessment criteria were considered appropriate and relevant but there was no clear indication of the mark given for the coursework on display. Examination and feedback to the students was confirmed as fast and efficient.

There is a system which ensures the evaluation of the lecturers in delivering the study modules and thereby assessing the teaching quality.

In the final projects the Reviewers would expect to see analyses using a variety of methods but in some final reports the analysis was relatively straightforward and only partly corresponded to the requirements of BSc studies. It would be expected that two or more results would be compared to each other, e.g. experimental and predicted, and this was evident only in very few final reports. There was very little discussion about the obtained results by the students. This discussion or reflection is one of the most important parts of the final project and the student must demonstrate their ability to understand the problem, decide on methods of analysis / investigation, obtain results and make final decisions based on logical consideration and review (for example to prove or to reject an offered solution to install fifth gear into an automotive gearbox). There also appeared to be some lack of methodological information how to prepare final project reports because there were weaknesses along these lines in the majority of the presented final reports. The Reviewers also thought that some of the report marking was too generous.

The Reviewers were unable to comment on any system for assessment and recognition of achievements acquired in non-formal and self-education because there was no evidence of this

either in the self-evaluation report or from the meetings undertaken. It would appear that this is a topic which would benefit from direction at a national level; it has become important in many other European countries over the last 10 years.

5.5. Graduates placement

There was little information on BSc graduate placement in the Self-evaluation report; it indicates that an employer survey was ineffective. There is only the information that 62.5% of BSc graduates have jobs while they are studying for MSc and all are working according to their speciality. Information on graduate placement is essential not only for the assessment of the programme but also for new students as encouragement and motivation. The Reviewers met 4 graduates with BSc degrees although all either had MSc degrees as well or were studying for MSc while working. Whilst the discussions were interesting, the Reviewers thought that these were not representative and certainly no substitute for graduate placement data. The Reviewers met 9 employers who between them employed many graduates from the programme. All of them (except one) were very satisfied with the graduates of the programme (it was not clear which were employing BSc graduates and which MSc). The representative of Lithuanian Railways was very satisfied and enthusiastic. All employers were very concerned about reducing student numbers and a potential shortage of qualified graduates in the future.

Comments:

The study process and student assessment of the BSc Programme in Vehicle Engineering at VGTU has developed systematically. The Reviewers would like to see more focus on student admission, increased social support, and international support (Erasmus, languages) for the students, and a review of final project dissertation marking, methodology and content. More data on graduate placement should have been included in the Self-evaluation report.

Recommendations:

A strategic review to investigate and address the decline in student admissions to the programme should be made including representatives of the students, graduates and employers ("stakeholders") as participants in the review.

An analysis of student non-completion / dropout should be made with follow-up actions implemented to encourage and to motivate students to continue their studies to completion.

Increase the number of final projects that are offered in collaboration with industry and social partners, including if possible some form of payment to students during their studies in university.

The methodological information on how to prepare final project reports should be improved.

Ensure that the final projects include analysis with experimental or some other form of comparison or validation / verification.

Review the final project report marking for standard and consistency (the Reviewers noted that some of the examples shown were generously marked).

Provide more support for foreign language learning for the students, e.g. by providing lectures in foreign languages, and encouraging visiting lecturers.

6. Programme management

6.1. Programme administration

As with the MSc programme, the programme management appeared to be effective. BSc students and graduates were very complimentary about the support they received from the academic staff. The Reviewers noted that programmes are said to be revised once every 2-4

years, and students, lecturers, administrators and employers theoretically are involved in programme review. But there is no formal clearly described procedure how it works. It is recommended that a formal procedure covering programme review is prepared and used in future.

6.2. Internal quality assurance

The self-assessment report for the BSc programme at VGTU was incomplete in its preparation with some data missing and some appendices not translated e.g. staff profiles. This should be improved for future reviews.

As with the MSc programme, there appears to be no formal system for programme improvement; instead this is based on various meetings and opinions which are not collected and compared periodically. The Reviewers would like to see a clear annual or bi-annual plan of action with dates and the names of responsible people. In this way the university can work towards compliance with a quality management system ISO 9001 which states: "you must write as you do and you must do as you write". Also students and graduates should be more involved in internal quality assurance.

Stakeholders are very well involved in the programme quality improvement. They participate in the final dissertation defence panel and also in the Faculty Studies Committee. This cooperation is very beneficial for the following reasons:

- preparing and coordinating study programs and modules;
- selecting information on professional skills of University graduates;
- investigating the demand for specialists;
- analysing and forecasting the development of regional industry.

Staff and employers also confirmed that they have meetings to discuss actual problems in industry which are related to the programme. This was especially pointed out by the representative of the Railway company who confirmed that there were such meetings almost every week. This is good, but would be much better if the programme were revised once every 2-4 years, and students, lecturers, administrators and employers were involved in programme review. But there is no formal clearly described procedure how it works. It is recommended that a formal procedure covering programme review is prepared and used in future.

Comments:

The programme management has developed systematically. The Reviewers would like to see a formal procedure prepared and used to cover programme review. Cooperation between the Faculty / University and industry is good but informal. For the next review the Self-evaluation report should be better prepared.

Recommendations:

A formal procedure covering programme review and programme improvement should be prepared and used in future with a clear plan of action as an outcome.

Cooperation between the Faculty / University and industry should be formalised.

III. RECOMMENDATIONS

Programme aims and learning outcomes:

1. The learning outcomes / attitudes should be included in the module descriptors.
2. More evidence of three important learning outcomes for a BSc (Cycle 1) programme is required:

(i) Communications skills in written and verbal form should be explicitly included in 'Transferred skills' (D).

(ii) The principles of critical review and evaluation should be developed in all categories of learning outcomes (A) – (D).

(iii) Knowledge and understanding of project planning and management should be specifically included in the learning outcomes.

Staff:

3. Staff profiles and research publications should be translated from the Lithuanian for the self-evaluation report.
4. The low representation of female academic staff in the Department should be addressed at Faculty level in planning for staff composition and turnover.
5. More mobility and external exposure for staff is encouraged. Staff should be encouraged to take greater advantage of the opportunities offered by mobility schemes such as the Erasmus scheme, and all staff should be encouraged to improve their English language skills.

Facilities and learning resources:

6. The need for new premises, especially for computer based teaching and laboratory work, should be investigated. Since there appear currently to be concerns over premises and facilities the Faculty and University should agree an action plan based on the outcomes of the review.
7. Staff and students should use the CAE facilities more, especially for the final projects.

Study process and student assessment:

8. A strategic review to investigate and address the decline in student admissions to the programme should be made including representatives of the students, graduates and employers ("stakeholders") as participants in the review.
9. An analysis of student non-completion / dropout should be made with follow-up actions implemented to encourage and to motivate students to continue their studies to completion.
10. Increase the number of final projects that are offered in collaboration with industry and social partners, including if possible some form of payment to students during their studies in university.
11. The methodological information on how to prepare final project reports should be improved.
12. Ensure that the final projects include analysis with experimental or some other form of comparison or validation / verification.
13. Review the final project report marking for standard and consistency (the Reviewers noted that some of the examples shown were generously marked).
14. Provide more support for foreign language learning for the students, e.g. by providing lectures in foreign languages, and encouraging visiting lecturers.

Programme management:

15. A formal procedure covering programme review and programme improvement should be prepared and used in future with a clear plan of action as an outcome.
16. Cooperation between the Faculty / University and industry should be formalised.

IV. GENERAL ASSESSMENT

The study programme *Transport engineering (*state code – 61203T110) Vilnius Gediminas Technical University is given positive evaluation.

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

No.	Evaluation area	Final
1	Programme aims and learning outcomes	3
2	Curriculum design	4
3	Staff	3
4	Facilities and learning resources	3
5	Study process and student assessment (student admission, student support, student achievement assessment)	3
6	Programme management (programme administration, internal quality assurance)	3
	Total:	19

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

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

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

4 (very good) - the area is exceptionally good

Grupės vadovas:
Team leader: Prof. Andrew Day

Grupės nariai:
Team members: Assoc. Prof. Jørgen Kristiansen
Prof. Mathias Paschen
Prof. Andrzej Reński
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