



CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

GENERAL STUDY FIELD
TRANSPORT ENGINEERING OVERVIEW
2020

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Study Field Data

<i>Name of HEI</i>	<i>Name of study programme</i>	<i>State Code</i>
Vilnius Gediminas Technical University	Transport Engineering (BA)	6121EX051
	Transport Engineering (MA)	6211EX058
Kaunas University of Technology	Vehicle Engineering (BA)	6121EX020
	Vehicle Engineering (MA)	6211EX021
Vytautas Magnus University	Transport Machinery Engineering (MA)	6211EX025
Vilnius College of Technologies and Design	Technical Maintenance of Automobiles (BA)	6531EX025
	Railway Transport Engineering (BA)	6531EX021
Kaunas University of Applied Engineering Sciences	Automobile Technical Maintenance (BA)	6531EX003
Šiauliai State College	Automobile Technical Exploitation (BA)	6531EX048
	Transport Logistics Technologies	6531EX051
Klaipėda State College	Automobile Transport Engineering	6531EX015
Alytus College	Automobile Transport Engineering (BA)	6531EX001

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I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 Order [No. V-149](#).

The evaluation is intended to help higher education institutions to constantly improve their study process 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 field SKVC takes a decision to accredit study field either for 7 years or for 3 years. If the field evaluation is negative such study field is not accredited.

The study field and cycle is **accredited for 7 years** if all evaluation areas are evaluated as “exceptional” (5 points), “very good” (4 points) or “good” (3 points).

The study field and cycle is **accredited for 3 years** if one of the evaluation areas was evaluated as “satisfactory” (2 points).

The study field and cycle is **not accredited** if at least one of evaluation areas was evaluated as “unsatisfactory” (1 point).

1.2. THE REVIEW TEAM/EXPERT PANEL

The review team was completed according he Experts Selection Procedure (hereinafter referred to as the Procedure) approved by the Director of Centre for Quality Assessment in Higher Education 31 December 2019 [Order No. V-149](#). The Review Visit to HEIs was conducted by the team from 16-20/11/2020 and 14-18/12/2020.

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7. Gytautas Urbonas, Kaunas University of Applied Sciences, Bachelor student of Automatic Control and Robotics studies (college team)

1.3. STUDY FIELD/STUDY FIELD PROFILE

Lithuania is the main transit country in the Baltics. Its share of transport-related business is higher than the international average. That is especially the case in goods traffic with lorries and trains. The technology of railways and lorries has therefore been a long tradition in Lithuanian university and college programmes.

Individual motor-car ownership has been on the rise too since individual incomes have been rising. Thus the role of automobile engineering has also become more important recently.

In an international context, there are various structures of transport engineering teaching and research. In Lithuania there is a two-level university system of universities and colleges. Universities offer the full secondary academic programme (Bachelor, Master and PhD/doctorate), whereas colleges offer Vocational Bachelor degrees only and are oriented towards practical education.

Technologically, transport engineering consists of infrastructure engineering, vehicles engineering and other auxiliary technologies, such as electrical engineering. Transport infrastructure is often dealt with in faculties of civil engineering, whereas vehicle engineering is frequently integrated into Mechanical Engineering faculties. Sometimes the areas overlap, and there are also programmes which combine all areas of transport engineering, occasionally including transport-specific electric engineering and business administration.

The study programmes of the study field under review lay their main focus on vehicle engineering. Aspects of infrastructure engineering are dealt with only cursorily.

With the focus on vehicle engineering, taking into account the challenges by climate change is an important element in all programmes. They will have to deal with new technologies, which requires them to be highly adaptive in ideas, resources and equipment.

The universities and colleges thus have to take a strategic decision: Teaching the breadth of (vehicle) transport engineering and doing research in all areas or specialising in certain fields. A broader approach improves the attractiveness for prospective students, whereas specialisation might improve the quality level of teaching and research. The universities and colleges under review have taken individual decisions in this respect, reflecting their respective history and expertise.

II. STUDY FIELD OVERVIEW BY EVALUATION AREAS

3.1. STUDY AIMS, OUTCOMES AND CONTENT

The study aims, outcomes and content reflect the various backgrounds, strengths and focuses of the three universities and five colleges under review. Some institutions offer mainly automobile engineering, while others also offer specialities or even programmes dedicated to railway engineering and logistics respectively. Two universities offer consecutive Bachelor and Master programmes, whereas one university offers a Master programme only.

The Bachelor programmes are structured in the usual state-of-the-art way in engineering: In the first three semesters the foundations are laid by teaching maths, mechanics and natural sciences. Additionally, some introductory courses into adjacent areas such as graphics are taught, as are languages. In the following semesters the teaching specifically turns to subjects of engineering, for example engine and transmission technology, complemented by modules introducing the students to the specifics of transport engineering and transport business. Towards the end of the programme, the students get the opportunity to select either specialist topics or branches of study. For example, railway engineering is offered as a branch of study in one university, whereas another university offers this topic as a subject within a catalogue of electives. Both approaches have their merits: Study branches are useful to deepen the knowledge in one area, whereas a catalogue of electives gives the students more autonomy in assembling their study plan individually.

In the second cycle the two universities which offer consecutive Bachelor and Master programmes continue their respective 'Bachelor philosophies' into their second-cycle programmes. In the branch structure the engineering of the chosen branch is deepened and broadened, i.e. more specific on one hand and complemented by subjects of adjacent fields on the other hand. The university with the elective-structure model and the university which offers a second-cycle programme only have a mixture of general compulsory subjects designed to provide a systematic overview of the requirements of transport and elective subjects, which go into the depth of science.

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDY ACTIVITIES

One important aim of secondary education is establishing a link between the education of students and their early involvement into research. That link is necessary for the university and the national economy to find the potential of individual students developing into junior researchers. The difficulty with this requirement lies in the fact that engineering programmes start with foundation subjects which do not obviously relate to the technology to do research on later. As to colleges, their scope of research is smaller and concentrated on the application of technologies. Their engineering students tend to be focused on direct application of their knowledge in practice rather than on research deemed as 'academic' or 'theoretical'. The colleges try to overcome this problem by introducing students into course projects, integrated projects and dedicated research projects in the study plan. The graduation theses are used as an introductory element into scientific research by both universities and colleges. The universities under review use this strategy in Bachelor and Master thesis papers, with a development from a more 'practical' focus during the first cycle to a more 'theoretical' one in the second cycle, culminating in the master thesis.

The extent to which the universities and colleges are successful with this varies according to their scientific profile. The experts found that some of them might be more ambitious in exploiting the opportunities thesis papers provide in leading the students to scientific work.

3.3. STUDENT ADMISSION AND SUPPORT

In an international context, the Lithuanian universities and colleges are in a middle position between the culture of free education championed in the Scandinavian countries and Germany, among others, and the approach of managing university courses in a commercial way, according to the Anglo-Saxon philosophy. On one hand, there are significant course fees, which points into the commercial direction. On the other hand, there are ways to get relief from them if there is an individual case. The centralised admission quota system, which is linked to government grants for the universities, is also an element of government intervention nearer to the idea of university education as a common good.

The universities and colleges thus have two 'customers': the students, whose course fees they need, and the state, whose licence and alimentation is also needed. In return, the universities and colleges try to educate the students in a way the national economy profits from and the students are satisfied with. This double requirement needs a strategy of continuous consultation of all relevant groups. As to the group of students, they expect a fair admission policy and support during their studies. All universities and colleges under review provided ample information about their policies as to student admission and support, and the expert panel interviewed students extensively on that topic. In an only mildly hierarchical structure, which academic organisations typically have, there cannot always be full control of actions of individuals, so that individual complaints are unavoidable to some extent. Generally however, all universities and colleges have adequate systems in place and also react spontaneously to upcoming problems. Compared with universities and colleges in other countries, the faculties under review have well-functioning formal and informal procedures and a good personal relationship to their students.

3.4. STUDYING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

There are several disparate aspects to be reported on in this section. They refer to the internal study process, the opportunity for studies abroad, internships and employment after graduation.

The universities and colleges ensure that the study programmes are executed according to the study plans; there was no criticism about this at all by the students. They also offer individual study schedules. Student performance is measured adequately. Internships and studies abroad, though, are not taken up by the students in a sufficient way yet. It is difficult to assess the reasons for this, but evidence suggests that the basic interest of students is not very high and there are many understandable individual obstacles, so that it is very difficult for the universities and colleges to improve in this area. College students in particular tend to have deep roots in their native areas and want to stay there during their working life. From their point of view a spell in a different area or even abroad does not offer as much potential benefit as it might from the point of view of a student who aspires to become a researcher.

Conversely, due to both the universities and the colleges having good contacts to employers in their vicinity, internships are provided in a sufficient way, frequently leading to thesis papers or even to employment. Employers of college graduates tend to explicitly favour graduates who are fit to do practical work right after their employment. Generally, employers

are satisfied with the knowledge and expertise of the graduates of both universities and colleges, and they are very much sought after.

3.5. TEACHING STAFF

All universities and colleges under review fulfil their obligations as to the number and academic level of their staff. They also support their staff in gaining additional teaching qualifications and expertise. There is not always an obligation for the teachers to be active in professional improvement, but usually there is an incentive in the form of salary supplements, so that most staff appear to pursue such opportunities.

A weakness of most universities and colleges is the relative lack of interchange with international colleagues. The universities and colleges are recommended to seize more opportunities to invite foreign teachers and send their own abroad.

3.6. LEARNING FACILITIES AND RESOURCES

At the time of the review the Covid-19 pandemic raged in Europe, so that most institutions of secondary education were more or less closed to the public and also to students. Most teaching was relocated onto the Internet. The experts were shown classrooms and other facilities remotely. As the adequacy of classrooms could not be appraised sufficiently in this way, the focus lay on the quality of the remote-learning facilities and processes. It turned out that students tend to be confused if universities/colleges use various information channels and software products simultaneously. So far, these products had been regarded as an additional rather than the main communication tool, so that various specialised software had been developed for specific purposes and with focus on smooth and safe back-office procedures. In the future a more systematic approach may be necessary to improve the 'front office' appearance too. That may be the case generally, beyond the study field and the specific universities and colleges reviewed.

The laboratories, the second important leg of learning facilities, strongly reflect the varying histories of the institutions under review. Some have had a long tradition of transport vehicle engineering and thus either possess the necessary rooms and equipment or can get access to it through their social partners. Others rely more on their social partners. The social partners thus have some responsibility too in securing continuous and sustainable availability of laboratories and laboratory equipment.

3.7. STUDY QUALITY MANAGEMENT AND PUBLICITY

All universities and colleges take great effort to provide adequate procedures of quality management. They have created many procedural guidelines and documents to this end. The experts appreciate this unreservedly and did not have any major recommendations for improvement as to the formal processes. Generally, the processes are also executed in an adequate way. Sometimes, though, the number of students taking part in formal surveys should be higher, according to the opinion of the experts. Some students appear to doubt the relevance of the quality management process and their clout in influencing the quality of their environment at the university.

The quality management process regarding the social partners is also a mixture of formal procedures and informal, individual networks. Both approaches complement each other, but it is necessary to take care that they are coordinated.

III. EXAMPLES OF EXCELLENCE

The expert panel identified the organisation of the process of the teaching staffs' academic mobility at Vilnius Gediminas technical University (VGTU) as an example of excellence. There are opportunities for lecturers to improve the English Languages skills, update their knowledge and professional skills and there is a transparent selection system.

Candidates who take part in the mobility for the first time get additional extra points in competition. As a result, the number of outgoing teachers has increased significantly.

IV. RECOMMENDATIONS

MAIN STRATEGIC RECOMMENDATIONS FOR IMPROVEMENT IN THE TRANSPORT ENGINEERING STUDY FIELD

- **Strategic recommendations at institutional level (for Higher Education Institutions):**

It is recommended that the possibilities of international cooperation are explored more strongly. Strategies to motivate students (and also, in some cases, teachers) to become more open to mobility in general would be desirable.

The role of research should be emphasised more in the 1st cycle programmes.

The future development of software providing contact to students should take into account the interest of students to be offered a coherent system of contacts (teaching as well as administrative) with the universities and their staff.

It is recommended to review quality standards set for research by including quality criteria for the research output. Interdisciplinary research might help with the benchmarking during that process and is also strongly recommended.

Course cards should contain more specific information about the course contents and be available in the English language.

- **Strategic recommendations at national level (for the Ministry of Education and Science):**

The Ministry should develop and specify the study field of Transport Engineering further in a dialogue with the universities and colleges. The title 'Transport Engineering' suggests that it includes transport infrastructure, though this is not the case. Transport infrastructure is mainly located at faculties of civil engineering or sometimes environmental engineering, but it is also a part of Transport Engineering.

The Ministry might support the universities in their effort to develop software platforms that provide unitary service to the students, replacing the current patchworks of communication channels. That is an arduous long-term task the universities and colleges might not be able to complete on their own. The necessity for this has come up during the pandemic more forcefully.

V. SUMMARY

The aims and outcomes of the Bachelor and Master Vehicle Engineering study programmes are in conformity with the needs of society and the labour market and are reflected in the programmes' details. Most Bachelor and Master final theses are also generally of good quality. However, since there are some exceptions additional measures should be taken to ensure more uniform quality of the final theses, in particular those leading to a Master's degree. The topics should not too closely resemble each other.

For achieving a sufficient number of research projects it is necessary to enhance international collaboration for academic activities.

The international mobility opportunities do not seem to be very appealing for second cycle students in particular, who are also employed during their studies. Financial support to students going into international mobility might be a factor for convincing them to take part in this kind of opportunity.

The laboratories of the universities and colleges vary in scope and quality. That is a result of the different historical backgrounds of these institutions and their programmes. The experts assess that all universities either have adequate equipment or have the potential to acquire it in due course. Some colleges have adequate equipment too, others rely more on services of social partners.

All universities and colleges have a good cooperation with social partners, who are involved in the allocation of practice placements. In some areas, though, industry cooperation should be improved further.

The qualification of academic staff is on a good level and complies with the requirements for the implementation of the programmes. It enables the achievement of the aims and learning outcomes of the study programmes and the relevant study courses. However, for enhancing internalisation it is necessary to launch special programmes for inviting leading researchers and professors, as well as guest specialists from business, also from abroad. One university already has a system in place covering elements of this.

In general, the students of all universities and colleges under review are satisfied with the feedback they get from their institutions, though some students reported little voluntary participation in surveys. The alumni interviewed by the experts also invariably emphasised the positive experience with the respective university or college, though not all of them were informed about their former university/college practising a formal quality management process.