

Final Study Programme Evaluation Rolling Stock Operation (professional bachelor)

at

Vilniaus technologijų ir dizaino kolegija

Assessment report

4 May 2012

Assesment report of the professional bachelor study programme Rolling Stock Operation. The final evaluation was carried out by **evalag** as part of the Study Quality improvement by Updating the Thermal Engineering, Mechanical Technology Engineering, and Rolling Stock Operation Technological Study Programs Project No. VP1-2.2-ŠMM-07-K-01-090.



Vilniaus technologijų ir dizaino kolegija (VTDK) commissioned **evalag** with the final programme evaluation of the newly created professional bachelor study programme "Rolling Stock Operation". The programme evaluation was carried out by an international expert team that assessed the study programme according to the Lithuanian quality assurance standards and the European Standards and Guidelines for Quality Assurance in the European Higher Education Area with the objective of accrediting and registering the programme according to Lithuanian higher education law and awarding **evalag**'s international quality label for study programmes.

1. Vilniaus technologijų ir dizaino kolegija (VTDK)

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

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

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

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

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

The rolling stock operation programme is offered by the Petro Vileišio Faculty of Railway Transport, which offers for its 1006 students five study programmes altogether:

- Rolling Stock Operation
- Railway Transportation Engineering
- Transportation Logistics
- Transport Information Systems
- Communication Links and Structures

Responding to the recent higher education reform in Lithuania and an employer's survey carried out by the college, the faculty completely updated and restructured the three first-named study programmes in order to adjust the programme contents to the demands of the labour market and to broaden the competences of the graduates.

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

- Christopher Bohlens, Leuphana Universität Lüneburg
- Prof. Dr.-Ing. Liping Chen, Fachhochschule Kaiserslautern
- Prof. Dr. Harald Gleißner, Hochschule für Wirtschaft und Recht Berlin
- Prof. Dr.-Ing. Haldor Jochim, Fachhochschule Aachen
- Prof. Dr.-Ing. Frank Lademann, Technische Hochschule Mittelhessen

The site visit took place on 5 to 7 March 2012 at VTDK. During the site visit the expert team met with representatives of the programme, the college administration, students, teaching staff, graduates and employers and visited the laboratories and seminar rooms used by the programme.

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

From **evalag**'s side, the accreditation was coordinated by Harald Scheuthle with assistance of Katja Götzen.

4. Programme assessment

4.1 Learning outcomes

Current situation

The self-evaluation report describes programme goals and learning outcomes of the rolling stock operation programme and links it with the curriculum. The learning outcomes describe professional knowledge and competences as well as general/soft skills. The programme description describes the learning outcomes and contents of each module or subject and gives detailed information on the content and working methods of the courses.

The programme intends to educate "railway transportation engineers who have draught rolling stock management skills; can plan and organize activity in performing rolling stock technical maintenance and operation, repair, and modernization work; and can, based on their qualifications, independently make technical decisions and successfully work under competitive market conditions and improve in their professional activity" (self-evaluation report, p. 7).

The programme was updated in 2010 in a project funded by the European Commission. The programme was updated by broadening the competences of the graduates and by including new technologies and teaching and learning methods in the curriculum in order to increase the competitiveness of the graduates on the labour market. Therefore, two tracks of the previous programme were joined in the new curriculum.

In updating the programme, VTDK took into account a recent study on the demand of specialists in the transportation sector. Additionally, in developing study programmes the college cooperates with employers formally (i.e. employer representatives are on the college's board) and informally through contacts between teachers and employers.

4.2 Curriculum design

Current situation

The curriculum is described in the self-evaluation report, the study plan and – more detailed regarding content and working methods – in the programme description. The curriculum is based on a total of 180 ECTS credits which is equivalent to 4800 working hours. 15 credits are devoted to general college study subjects, 135 credits are devoted to study field subjects and 30 credits to special study subjects among which nine credits are devoted to electives. The full-time programme covers six semesters with 30 credits each. The part-time programme lasts eight semesters with workloads of 21 to 24 credits.

The study field subjects include 36 credits of scientific basics for railway operation in the first three semesters and 12 credits of economics and law in the fourth and fifth semester. The curriculum covers altogether 30 credits of practices which are spread over the entire study period with 24 credits of different industry practice. 72 credits cover the core rolling stock subjects and modules including the electives. Three credits are covered by an applied research course and 12 credits are devoted to the graduation thesis.

The curriculum of the full-time programme has a high proportion of practice hours which reflects the practical and professional orientation of the study programme. Out of the 1929 contact hours, 876 hours are devoted to laboratory work and 1053 hours to lectures. The remaining hours are individual consultation hours and term papers. 2400 hours are devoted to individual work among which 310 hours are the main industrial placement. The part-time programme has the same distribution of credits with a higher proportion of independent work.

The curriculum covers the main subjects of the rolling stock operation field and gives the graduates a solid foundation in the field. The general college study subjects are not subject related and cover humanities and social science subjects as well as language competences.

Assessment

The expert team regards the rolling stock operation curriculum as well-structured and logical. The subjects and modules cover the relevant contents and competences to meet the programme objectives and prepare the graduates for their professional tasks. The contents of the curriculum also reflect new developments in technology. The broad coverage of subjects and the comprehensiveness of the curriculum show, according to the expert team, the long tradition and good experience of the railway faculty with the rolling stock operation study programme.

The expert team commends the college for its strong education in basic sciences such as mathematics, chemistry etc., which are taught in the first semesters and lay the foundation for the understanding of programme-related contents. According to the experts, the college should ensure that the basics are related to the contents of the following modules.

The experts appreciate the variety of learning methods used in the curriculum and the integration of a high proportion of laboratory work in the curriculum.

Most of the subject and module descriptions follow the guidelines in exemplarily good fashion and give students and teaching staff a comprehensive overview over content, learning outcomes, working methods, assessment and workload of the subjects or modules.

Assessment

The expert team considers the staff qualification adequate for offering a professional college-level study programme and for providing the students with a qualified learning experience. They appreciate the motivation of the teaching staff met during the site visit. The number of teaching staff appears to be sufficient for supporting the newly introduced consultation hours, too. The students confirm that the teaching staff is easily accessible for them.

The expert team supports the decision of the college directorate to support staff development and encourages the college to provide funding for it. The experts especially encourage the college to continue and strengthen its support for staff members who want to attain a Ph.D. degree.

Recommendations

The expert team encourages the college to further build on its highly motivated and qualified staff for the development of its study programmes. The staff should take the lead in introducing innovations to study programmes instead of chiefly following suggestions of employers.

4.4 Facilities and learning resources

Current status

The seminar rooms, computer rooms and laboratories for the rolling stock operation study programme are listed in the self evaluation report and were visited by the expert team during the site visit. Altogether, the study programme uses a total of nine different seminar rooms and seven laboratories for the different subject fields, according to the self-evaluation report. The rooms and laboratories are shared with other study programmes. The computer rooms are equipped with the common software used in the field such as e.g. electronic interlocking simulation software. The laboratories are equipped with equipment which reflects the various generations of equipment currently used by the Lithuanian railway company. The traction engine cab simulator, the up-to-date track measurement system and the driver's cab simulator are especially remarkable. The equipment and software were mostly financed by EU funding or donated by companies in the field. The library offers textbooks and learning resources for the students and gives access to professional journals. The literature is mostly in Lithuanian or Russian. Most textbooks or methodological publications are prepared by the lecturers and are available in sufficient numbers for the students in the library or online via Moodle.

Assessment

According to the expert team, the facilities for the study programme are adequate in size and quality to provide a high level learning experience. The team commends the college to its excellent and modern laboratories and up-to-date software equipment which provide very good conditions for the practical education of the students. The laboratories are especially well equipped for training the students in performing tasks related to the future employments, as the software and equipment used by the college is by and large the same as the infrastructure used by the Lithuanian railway company. The experts commend the college for its efforts to acquire funds for equipment and

Each subject is concluded with a student assessment. The final subject assessment is composed of at least two different assessment forms and combined according to a predefined formula. This leads to a variety of different examination methods, e.g. written exams, tests, practical works, project reports and independent work, which assess different competences. The assessment methods and formulas used for creating the final marks are described in the programme description. The individual marks are assessed and processed by the lecturer of the subject and the final marks are then submitted to the faculty administration.

Drop-out rates are at about 12% per year (in the railway faculty as a whole). According to the faculty, the highest drop-out rate occurs in the first year. The faculty as well as the students see low motivation of student for the chosen subject, high requirements in basic science subjects, adaptation problems, difficulties to combine work and studies, financial problems and termination of studies to work abroad as main drop-out reasons. The renewed rolling stock operation programme has now a larger proportion of individual consultation hours which may contribute to a reduction of drop-out rates.

The study programme includes – among other shorter internships or practical placements – an eight week internship (12 credits) in a company – mainly at the Lithuanian railway company. The students search their place independently but in case of need, the college provides support through their company contacts. Before the internship starts, the student, the company and the responsible lecturer agree on the task that should be performed during the internship.

The bachelor thesis is mostly written at the college under the supervision of a lecturer; however, the final practice may be used to collect data in a company to prepare the thesis.

Students have the opportunity to participate in mobility programmes. The college takes actively part in the Erasmus programme and has several partner institutions in Europe. The most important exchange countries for the railway faculty are Slovenia and Poland. The number of incoming exchange or full students, however, is very low, as the college does not yet offer courses in English.

After finishing their studies the majority of the graduates seek a job in their profession, mostly successfully according to the information of the college. About 10% seek a Master degree. In order to meet the admission requirements for a Master programme at a Lithuanian university the graduates with a professional bachelor degree need to attend one and a half years of bridge courses.

Assessment

From the point of view of the expert team the study process of the rolling stock operation programme seems to be well-organised and well-balanced. The organisation of the study process seems to be adequate to achieve the intended learning outcomes. This assessment is also confirmed during the site visit by the students, who were generally satisfied with their situation at the college and appreciate VTDK for its good reputation and good job opportunities. The students noted the easy and close contact with their lecturers. The assessment scheme is transparently described and uses multiple assessment methods to check different competences of the students. The study programme documents and programme description are available on the college's website. The expert team has not reviewed the examination regulations, because they were not available in English.

The college also offers its students opportunities for international mobility. The expert team encourages the college to strengthen these mobility programmes and to further

study subjects and main study subjects. The faculty analyses the results of this survey which are then used by the programme committee to design the programme. In the next step, the programme committee defines the programme goals and learning outcomes and designs the subjects to achieve the desired learning outcomes. In this process, the relevant ministerial regulations (general and specific requirements, etc.) are taken into account. Ultimately, the committee designs a curriculum and assigns credits to the subjects. In the next step, the lecturers develop the contents of their subjects according to the specifications of the curriculum. Once finished, the programme committee discusses the curriculum and the individual subjects with the lecturers. The finalised programme is then discussed by the faculty board, and after it has been adopted it will be voted on by the academic board of the college before finally the programme can be presented for accreditation and offered to students.

The programme committee meets regularly and reviews the programme on a yearly basis. For programme improvement the college builds on initiatives of its lecturers, results of the quality assurance instruments and its close contact with its social partners. The recent programme renewal was carried out in close cooperation with employers in order to customise the programme content to the needs of the labour market.

On the administrative side, the head of department is in charge of the programmes offered by the department. The railway faculty has two departments which coordinate the five programmes of the faculty:

- Railway Information Systems and Infrastructure Department
 - o Railway transportation engineering
 - o Transport information systems
- Railway Operation Department
 - o Rolling stock operation
 - o Transportation logistics
 - o Communication links and systems

Due to the update and introduction of new programmes the railway faculty is currently in the process of changing its structure.

On programme level the department carries out student evaluations of individual courses and subjects. The results of the evaluations are analysed and discussed in the department or, if needed, between lecturer and dean.

On college level, a quality assurance office supports the faculties and study programmes in their quality assurance efforts. The college also provides a quality handbook that describes the most relevant processes. Currently the college is carrying out an EU-funded project aimed at redesigning its internal quality assurance system and at developing a quality management system based on a combination of EFQM and ISO. In this project, the college will also define strategic performance indicators for its faculties.

Assessment

The expert team regards the programme management as clearly structured and efficient. The experts appreciate the clear process of designing new study programmes and the strong involvement of external stakeholders in the improvement of the study programmes. However, the experts still see the need of a clearly designated pro-

ther developing the programme the college should assume the role of the leader and innovator and propose programme innovations that meet the future needs of the labour market. Therefore, the college staff needs to keep up with current trends in the academic as well as professional field for being able to react appropriately and prepare graduates ahead of time for changes in the professional and economic environment. The experts see further internationalisation of the programme by strengthening English language skills, increasing students and staff exchange in both directions and inviting foreign guest lecturers as one important element to induce innovation.

According to the expert team the renewed rolling stock operation programme meets the Lithuanian requirements for programme accreditation. Therefore, the team recommends the programme for accreditation.

The expert team also recommends awarding the **evalag** label for programme accreditation as the programme meets the Lithuanian evaluation criteria for study programmes on which the label is based. The team recommends the college to consider and implement the recommendations in this report to further improve the programme.

6. Decision of the Accreditation Commission

The accreditation commission of **evalag** accredited the professional bachelor programme "Rolling Stock Operation" of the Vilnius technologijų ir dizaino kolegija (VDTK) and awarded the **evalag** label for programme accreditation. The accreditation is valid from **May 2012 until August 2015**.

To further improve the study programme the accreditation commission affirms the recommendations given by the expert group.

Evaluation Scores

No	Evaluation Area	Evaluation of the area, points
1	Programme aims and learning outcomes	3
2	Curriculum design	4
3	Teaching staff	3
4	Facilities and learning resources (facilities, equipment, learning materials)	3
5	Study process and students' performance assessment (student selection, performance assessment, support)	3
6	Programme management (administration of the programme, internal quality assurance)	3
	Total	19
		Maximum score: 24