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### Study programme "Innovative road and bridge engineering"

#### Main attributes

Title	Innovative road and bridge engineering
Identification code	BMI0
Education classification code	45582
Level and type	Academic Master Study
Higher education study field	Architecture and Civil Engineering
Head of the study field	Uģis Bratuškins
Deputy head of the study field	Juris Smirnovs
Department responsible	Faculty of Civil Engineering
Head of the study programme	Ainārs Paeglītis
Professional classification code	
The type of study programme	Full time
Language	English
Accreditation	16.11.2022 - 17.11.2028; Accreditation certificate No 2022/31-A
Volume (credit points)	60.0
Duration of studies (years)	Full time studies - 1,5
Degree or/and qualification to be obtained	Master degree of engineering science in civil engineering / –
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	Professional bachelor degree in civil engineering or professional bachelor degree in transportation engineering, or comparable education

#### Description

Abstract	The study programme was implemented at Riga Technical University (RTU) and Vilnius Gediminas Technical University (VGTU) in accordance with the agreement concluded on 17 March 2014 about the joint study programme. The study programme prepares highly qualified specialists for independent scientific research and practice in road and bridge design, construction and maintenance in Latvia, Lithuania or other countries. The form of study is fulltime studies. The language of the rating of studies and their results will be English. The duration of the studies is 1.5 years. The study programme was developed in light of higher professional education trends in Europe. The study programme is designed to be recognizable in Europe so that students gain both theoretical knowledge and practical skills to be competitive and the corresponding requirements of the labour market. The study programme is being implemented with the help of different study forms: lectures, practical classes and individual literature studies. Semester one classroom lectures will take place at VGTU, semester two – at RTU and the place for semester three lectures, i.e. VGTU or RTU will depend on the selected module by a student. During the studies, students will gain the latest knowledge about the theoretical and practical innovations in road and bridge design, construction and traffic safety for both Latvia and Lithuania, and the world. During the studies, students acquire in-depth knowledge about road pavement construction, bridge nonlinear analysis, road network planning theory, as well as methods of complex road analyses and determination of risk and safety factors in bridge engineering. The study concludes with a Master Thesis.
Aim	The general objective of the study programme is to provide a set of theoretical knowledge and practical skills to ensure that students attain the relevant competencies of a master's academic degree. The study programme shall aim at preparing students for independent scientific research activity, providing academic education in order to prepare for further doctoral studies, teaching activities of higher education or practical work in the field of transport infrastructure engineering.
Tasks	General objectives of the study programme: <ul style="list-style-type: none"> <li>- to ensure competitive master's higher education according to international standards and to prepare students for practical work, to develop research skills and encourage their use;</li> <li>- to provide students with comprehensive knowledge in the field of Transportation Engineering, make professional skills and develop competencies in accordance with labour market requirements;</li> <li>- to promote interest in further education and supplement of academic and professional knowledges;</li> <li>- to encourage student's interest in social processes, to stimulate students' development as positive, modern, accountable and fully capable personalities who can act independently and make decisions independently;</li> <li>- to ensure development and changes of programme content, study process and scientific research according to the latest technologies and knowledge in the field of road and bridge engineering, international practice, science and didactic practice;</li> <li>- to encourage staff and student interaction in scientific research and practical use of obtained results according to international standards and trends in the civil engineering industry;</li> <li>- to promote and develop the international exchange of academic staff and students and participation in projects.</li> </ul>

Learning outcomes	<p>Graduates of the study programme:</p> <ul style="list-style-type: none"> <li>- are able to show a specific basic and specialized knowledge in the Civil Engineering science discipline and a critical understanding of this knowledge. A part of the knowledge conforms to the highest level of achievement in the field of Transport and Traffic Sciences;</li> <li>- can show an understanding of the most important concepts and relationships in the field of Civil Engineering science discipline;</li> <li>- are able to carry out professional, innovative or research work, formulate and describe analytically the information, problems and solutions in the field of Civil Engineering science discipline, to interpret and have a substantiated discussion about them on the basis of the mastered theoretical knowledge and skills;</li> <li>- are able to work on their own professional development, show knowledge of different scientific approaches by solving technical or scientific problems, take responsibility and initiative by working individually, in a team or other people management, make decisions and come up with creative solutions in variable or uncertain situations;</li> <li>- are able to obtain, select and analyse information independently and use it to take decisions and deal with problems, show that they are aware of professional ethics, can analyse the influence of their professional activities in the environment and society and participate in the development of the professional branch.</li> </ul>
Final/state examination procedure, assessment	<p>The study programme completes with the final examination which is rated in 10-point grading scheme. Final examination includes the defence of master thesis.</p> <p>The following assessment criteria are taken into account during the defence of master thesis:</p> <ul style="list-style-type: none"> <li>- systematization, updating and enlargement of theoretical and practical knowledge and personal practical experience;</li> <li>- independently study of information of teaching and scientific literature, specialty relevant laws and regulations and other sources including in foreign languages;</li> <li>- skill to solve the research problem which includes individual and complex elements of novelty and linking it with theoretical guidelines;</li> <li>- analysis and systematization of actual applied problems, development of recommendations;</li> <li>- development of practical solutions and planning;</li> <li>- presentation skills of the research and the practical results.</li> </ul>
Description of the future employment	<p>Graduates of the study programme are qualified specialists who can design roads, bridges and other structures for transport infrastructure, manage and maintain these structures; can make the design calculations, is familiar with construction material technology and construction management; can organize and manage the site resources professionally and in a cost-effective manner - may make the construction and operation process of planning and monitoring; examine the design documentation, site marketing plan for all the partners involved in cooperation and the arrangements for carrying out the work, to give the necessary instructions to subordinates and sales members and to check the executive documentation of orders, to ensure that the work is carried out in accordance with the requirements of the standard and within the time limits laid down in the approved framework and the costs are included in the estimates; is able to plan the necessary measures to ensure the quality and road safety on the site; draw up and control the executive documentation; control and analyse the execution of work and the organization of work and conduct the projects on appropriate technological level, the effective and appropriate use of resources; can conduct scientific research and the development of new construction engineering theories and methods.</p>
Special enrollment requirements	English language proficiency equivalent to at least CEFR B2 level.
Opportunity to continue studies	Doctoral studies.

**Courses**

No	Code	Name	Credit points
<b>A</b>		<b>Compulsory Study Courses</b>	<b>26.0</b>
1	<a href="#">BTB709</a>	Scientific Researches and Innovations	2.0
2	<a href="#">BTB710</a>	Innovative Pavement Structure Design	4.0
3	<a href="#">BTB722</a>	Nonlinear Analysis of Reinforced Concrete Bridges	4.0
4	<a href="#">BTB713</a>	Dimensional Road Design	4.0
5	<a href="#">BTB728</a>	Risk and Safety in Bridge Engineering	4.0
6	<a href="#">BTB714</a>	Innovative Timber and Reinforced Concrete Bridges	4.0
7	<a href="#">BTB720</a>	Durability of Bridge Structures	4.0
<b>B</b>		<b>Compulsory Elective Study Courses</b>	<b>14.0</b>
<b>B1</b>		<b>Field-Specific Study Courses</b>	<b>12.0</b>
1	<a href="#">BTB711</a>	Road Integrated Research	4.0
2	<a href="#">BTB712</a>	Traffic Safety Management	4.0
3	<a href="#">BTB717</a>	Steel-Concrete Composite Bridge	4.0
4	<a href="#">BTB718</a>	Computer Aided Design of Bridges	4.0
5	<a href="#">BTB721</a>	Composite Materials for Bridges	4.0
6	<a href="#">BTB715</a>	Road Network Planning	4.0
7	<a href="#">BTB716</a>	Land Use Planning	4.0
<b>B5</b>		<b>Pedagogical and Psychological Sciences Study Courses</b>	<b>2.0</b>
1	<a href="#">HSP484</a>	Psychology	2.0
2	<a href="#">HSP446</a>	Pedagogy	2.0
<b>E</b>		<b>Final Examination</b>	<b>20.0</b>
1	<a href="#">BTB727</a>	Master Thesis	20.0