RĪGAS TEHNISKĀ UNIVERSITĀTE

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Study programme "Railway Engineering"

Main attributes

Title	Railway Engineering
Identification code	MCH0
Education classification code	42525
Level and type	Professional Bachelor Study
Higher education study field	Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering
Head of the study field	Aldis Balodis
Department responsible	Faculty of Mechanical Engineering, Transport and Aeronautics
Head of the study programme	Mihails Gorobecs
Professional classification code	2149 27
The type of study programme	Full time, Part time
Language	Latvian, English
Accreditation	16.11.2022 - 17.11.2028; Accreditation certificate No 2022/30-A
Volume (credit points)	160.0
Duration of studies (years)	Full time studies - 4,0; Part time studies - 5,0
Degree or/and qualification to be obtained	Professional bachelor degree in railway transport / railway transport engineer
Qualification level to be obtained	The 6th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	Secondary education

Description

Abstract	The RTU is the only higher education institution in Latvia preparing highly qualified specialists in the railway sector. The study programme is unique and provides a theoretical and practical basis that will allow graduates to work in railway transport companies, organisations, as well as research or educational institutions. The study programme includes study courses of general education, theoretical sector training, professional specialisation of the sector, free choice and humanitarian/social subjects, foreign languages. Practice is one of the most important components of the vocational study programme.
Aim	The aim of the study programme is to provide students with the opportunity to acquire professional skills in the field of railway engineering, in accordance with the professional standard, providing theoretical knowledge and competencies in transport information, communication and artificial intelligence (ICT), in driverless vehicle technologies and in programming, design and development of computerized and robotic transport control systems.
Tasks	The tasks of the study programme: - to ensure competitive training in the railway sector at the level of Bachelor's studies and in accordance with international standards; - to ensure the development and changes of the study content, study process and research in line with developments in the field of rail transport, international practice, science and didactics practices; - to promote the interest of students in further vocational development, supplementing academic knowledge, and continuing studies at the Master's level, developing research skills and promoting their use; - to develop students' ICT and programming skills in line with the current and future trends in railway digitalization, computerization and self-driving train management; - to promote students' interest in community processes, stimulate student development into a positive, modern, responsible, ethical and capacity-building personality that can act independently and make decisions; - to develop the practical use of research work and its results in the field of rail transport by academic staff and students; - to promote international mobility and participation in the projects.

Learning outcomes	Graduate of the study programme is: - able to improve an integrated and balanced railway system, design and develop advanced railway transport engineering systems and technologies, which can be incorporated in the existing railway system, thus promoting transport integration processes; - competent to promote introduction of newest technologies at a railway transport enterprise and carry out research, implement development and improvement measures and innovations; - able to analyse the functioning of the engineering and technical processes in railway transport and evaluate efficiency of technological processes in the railway transport systems; - competent to promote efficient use of internal logistics and IT in the management of engineering railway transport systems and technologies, and model the functioning of the railway transport systems and analyze work processes with the help of relevant hardware; - able to develop and improve long-term and mid-term railway transport systems and their technical development strategies, plans and programs, as well as to develop strategic and operative plans of railway traffic organization; - competent to develop and improve functional railway transport infrastructure systems, which ensure efficient and safe freight and passenger transportation, to develop advanced traffic organization solutions, automation and computerization tools in railway transport and promote development of multi-modal solutions and their integration in the railway transport systems; - able to design railway transport infrastructure and technical means, improve maintenance and repair technologies in accordance with the requirements of the regulatory enactments and technical documentation, develop technical and design documentation in accordance with the requirements of the regulatory enactments and technical documentation; - competent to participate in the completion of the tasks related to installation, launch and adjustment of the railway automatics and car equipment, to take part in the maintenance and repair of railway transport infrastructure, technical equipment and means, to improve organizational and management structures of a company dealing with maintenance, repair and service of railway technical means and equipment, to supervise the work of railway transport infrastructure, technical means and specialized equipment in accordance with the requirements of the regulatory enactments and technical documentation; - able to complete tasks in accordance with the work organization principles of an enterprise and focusing on the achievement of the common goals, observing the requirements of the normative documents on labour protection, electrical safety and fire safety, labour legislation norms, professional ethics principles, civil defence rules, taking care of the environment and sustainable development; - able to plan and implement their own professional development.
Final/state examination procedure, assessment	The bachelor thesis foresees an analysis of a railway problem. The defence of the thesis takes place orally and is being evaluated by a commission composed of the Chairperson, the Registrar and not less than three members. The chairperson of the Qualification Commission is selected from the leading specialists of the railway transport sector in the relevant direction, while the commission shall comprise half of the members of high-skilled railway transport specialists. The aim of the thesis is to teach the practical gathering of available information in different publications and computer networks, to formulate tasks and to implement them in a design part developed.
Description of the future employment	Graduates of the study programme may work in railway enterprises and organisations, as well as in research and educational institutions developing and maintaining of efficient technological systems and processes for rail transport.
Special enrollment requirements	English language proficiency equivalent to at least CEFR B2 level.
Opportunity to continue studies	Graduates can continue their studies in the professional master's degree programme “Railway Engineering,” or in any other RTU MTAF master's degree programme, as well as any other university master's level study programmes and vocational study programmes intended for studies after obtaining a bachelor's degree.

Courses

No	Code	Name	Credit points
A		**Compulsory Study Courses**	**94.0**
A1		**General Education Study Courses**	**12.0**
1	SDD700	Innovative Product Development and Entrepreneurship	6.0
2	MDI702	Introduction to Speciality and Research	1.0
3	ICA301	Civil Defence	1.0
4	IDA700	Basics of Labour Protection	1.0
5	ĶVĶ115	Chemistry for Engineers	2.0
6	VAS038	Environment and Climate Roadmap	1.0
A.2		**Field-Specific Theoretical Basic and IT Study Courses**	**36.0**
1	DMS101	Mathematics	9.0
2	MFB105	Physics	6.0
3	EDR577	Numerical Methods and Engineering Programs for Transport Tasks	4.0
4	EDE336	Computer Technologies in Transport	3.0
5	MDI711	Transportation System Computer Design and Programming (study project)	8.0
6	EEE226	Electrical Engineering and Electronics	2.0
7	MTH701	Technical Mechanics	4.0
A.3		**Field-Specific Professional Study Courses**	**46.0**
1	MDI710	Railway Microprocessor Systems (study project)	5.0
2	MDI712	Rolling Stock Structure and Traction	5.0
3	MDI713	Railway Infrastructure and Operations	6.0
4	MDI714	Transport Communication Systems	5.0
5	EDR486	Operation Technology and Management	5.0
6	MDI715	Railway Stations, Hubs and Train Traffic Organization	5.0
7	MDI716	Technology of Transport Logistic Systems (study project)	5.0
8	MAB215	General Metrology	3.0
9	MMM201	Material Science	2.0
10	MDI720	Electrical Machines and Electrical Devices of Rolling Stock	5.0
B		**Compulsory Elective Study Courses**	**28.0**
B1		**Field-Specific Study Courses**	**20.0**
0	MDI721	Railway Safety, Signalling and Interlocking	10.0
1	MDI700	Rolling Stock Repair and Technical Maintenance Technology	10.0
2	MDI488	Autonomous Vehicle Systems Design	10.0
3	MDI722	Railway Telecommunication Systems	10.0
0	MDI723	Cargo and Commercial Work Organization	10.0
1	MDI724	Transport Information Technology Systems	10.0
B2		**Humanities and Social Sciences Study Courses**	**4.0**
1	HSP377	General Sociology	2.0
2	HSP375	Sociology of Management	2.0
3	HSP376	Sociology of Personalities and Small Groups	2.0
4	HSP378	Politology	2.0
5	HPS120	Basics of Communication	2.0
6	IUV101	Fundamentals of Law	2.0
B6		**Languages**	**4.0**
1	VIA120	The English Language	4.0
2	HVD415	The German Language	4.0
3	VSL711	Latvian for Foreign Students	1.0
4	HVD104	The English Language	3.0
C		**Free Elective Study Courses**	**6.0**
D		**Practical Placement**	**20.0**
1	MDI706	Internship	20.0
E		**Final Examination**	**12.0**
1	EDR012	Bachelor Thesis Including Project	12.0