

## Study programme "Telecommunication technologies and data transmission engineering"

### Main attributes

Title	Telecommunication technologies and data transmission engineering
Identification code	EBG0
Education classification code	43523
Level and type	Academic Bachelor (First Cycle) Studies
Higher education study field	Information Technology, Computer Engineering, Electronics, Telecommunications, Computer Control and Computer Science
Head of the study field	Agris Nikitenko
Deputy head of the study field	Jurgis Poriņš
Department responsible	Faculty of Computer Science, Information Technology and Energy
Head of the study programme	Lilīta Ģēģere
Professional classification code	
The type of study programme	Full time
Language	Latvian, English
Accreditation	29.11.2023 - 30.11.2029; Accreditation certificate No 2023/44-A
Volume (credit points)	180.0
Duration of studies (years)	Full time studies - 3,0
Degree or/and qualification to be obtained	Bachelor degree of engineering science in telecommunication engineering
Qualification level to be obtained	The 6th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	Secondary education

### Description

Abstract	<p>An engineering degree opens up a wide range of career opportunities that can foster development in both the business and technology worlds. Telecommunications technology and data transmission engineering practice with communications systems and large-scale data networks that display, process, store and transmit analogue and digital information. For many years, the telecommunication and data transmission sectors are one of the fastest-growing industries in the world. Therefore, the study programme is designed to meet the growing demand for qualified specialists in this rapidly developing industry. The study programme introduces methods, theories, principles, and technologies to solve topical problems of signal transmission and reception, information security aspects, compatibility, interconnection, and coexistence of various communication networks, as well as the design of communication systems. Students gain competitive knowledge of modern communication technologies, telecommunication and data transmission systems, computer networks, basics of programming languages, mobile network architecture, etc. Both the study programme and the academic staff are open to innovation and modern interactive teaching methods. The study programme regularly includes new university-level study courses in perspective directions, as well invites experienced foreign guest lecturers.</p>
Aim	<p>The study programme aim is to provide students with the acquisition of theoretical knowledge and research skills in the field of engineering, which is based on theoretical principles in the fields of telecommunication technology and data transmission; to prepare innovative-minded specialists focused on the introduction of new technologies and knowledge with internationally competitive academic education. The aim and tasks of the study programme are formulated based on surveys of the needs and requirements of stakeholders (potential employers, universities, students, society, and scientific institutions) to graduate.</p>

Tasks	<p>Tasks of the study programme:</p> <ul style="list-style-type: none"> <li>- to provide competitive education in the fields of telecommunication technologies and data transmission in accordance with the level of bachelor's studies and international standards;</li> <li>- to provide the basics of fundamental sciences necessary for the acquisition of theoretical study courses in the field;</li> <li>- to ensure the acquisition of specialized knowledge characteristic of the study program and the ability to apply it for the formulation and solution of tasks in telecommunication technology and data transmission engineering;</li> <li>- to provide students with knowledge about the use of computer tools in the analysis, modeling, design, and programming of individual modules;</li> <li>- to ensure the development and changes of the content of the study program, implementation of the study process, scientific research work, following changes in the field of telecommunication and data transmission, international practice, science;</li> <li>- to provide students with comprehensive internationally competitive knowledge and develop competence following the market-defined requirements for telecommunications and communications engineers, preparing for practical work in the design, development, and maintenance of communications systems, large-scale data transmission, and processing;</li> <li>- to develop students' skills to perform high-quality acquisition, selection, analysis of necessary information, use for decision-making, as well as solving problems in the telecommunication and data transmission sector;</li> <li>- to promote students' interest in further supplementation of academic knowledge and further studies, to develop research skills, and to promote their practical use;</li> <li>- to stimulate the interest of students in the processes taking place in society, to stimulate their development towards a positive, modern, responsible, ethical and capable personality able to act independently and make decisions;</li> <li>- to promote international mobility and participation in projects.</li> </ul>
Learning outcomes	<p>Graduate of the study programme:</p> <ul style="list-style-type: none"> <li>- knows the basics of fundamental sciences necessary for the acquisition of theoretical study courses in the field;</li> <li>- manages the content of basic study courses of the telecommunication and data transmission subsector at the level necessary for the acquisition of specialized study courses and innovations in the field;</li> <li>- knows at the level of understanding: telecommunication and computer networks, main technologies and standards, principles of operation of telecommunication equipment, design methods of telecommunication networks and systems, data transmission systems and their main concepts, basics of operation of telecommunication equipment and networks and measurement methods;</li> <li>- is able to work with scientific, technical, and methodological literature available in a foreign language;</li> <li>- is able to use theoretical knowledge to formulate and solve specific tasks in the telecommunication and data transmission sub-sector;</li> <li>- is able to perform experimental data processing in the analysis of the features of the operation of telecommunication and data transmission systems;</li> <li>- is able to develop applications and algorithms for solving specific tasks;</li> <li>- is able to systematize related information, summarize, interpret and analyse the results of measurements and calculations, prepare summarized reports, present them;</li> <li>- is able to apply current technologies and software in the process of designing telecommunication and data transmission systems;</li> <li>- is able to perform an analysis of the situation regarding current problems in telecommunications data transmission systems and their solutions, based on the study of literature and information available on the Internet;</li> <li>- is able to perform diagnostics of telecommunications networks and equipment, and evaluation of the main operating parameters;</li> <li>- is able to work individually and in a team, to continue learning and educating in the field of telecommunications and data transmission systems, to act in a sustainable, ethical and responsible manner so as not to cause harm to society and the environment.</li> </ul>
Final/state examination procedure, assessment	<p>The acquisition of the study programme concludes with a final exam, which includes the development of an independent bachelor's thesis and public defence in an open session of the Final Examination Commission (FEC) on-site or using secure video conferencing and online meeting e-platform.</p> <p>The development and defence of the bachelor's thesis is part of the final exam on the academic curriculum, the purpose of which is to test the student's abilities and skills to independently solve problems and work in the field. The bachelor's thesis is an analytical study with elements of scientific work in the field of telecommunications and data transmission systems on a relevant topic, selected by the student individually and approved by the scientific advisor.</p> <p>The FEC consists of the head of the commission and at least two members of the commission. Students' knowledge, skills, and competencies are collectively assessed by the FEC in a closed session on a 10-grade scale, based on the author's report, the quality of answers to questions related to the developed work and remarks of supervisor and reviewer, as well as considering the assessment of the supervisor and reviewer.</p>
Description of the future employment	<p>Graduates of the study programme can become internationally competitive consultants, designers, technicians, engineers, infrastructure specialists, specialists of telecommunication systems analysis and monitoring, telecommunication technology solution development and implementation specialists, scientists.</p> <p>The knowledge acquired during the studies allows establishing your own company, holding leading positions in private companies or public institutions, as well as managing high-level engineering projects in the required fields of modern technologies.</p> <p>Potential employers:</p> <ul style="list-style-type: none"> <li>• telecommunications companies;</li> <li>• IT companies;</li> <li>• higher education institutions;</li> <li>• scientific research institutions;</li> <li>• production units in the field.</li> </ul>
Special enrollment requirements	English language proficiency equivalent to at least CEFR B2 level.
Opportunity to continue studies	Bachelor's degree entitles to continue academic or professional studies at the master study programme.

**Courses**

No	Code	Name	Credit points
<b>A</b>		<b>Compulsory Study Courses</b>	<b>108.0</b>
1	DE0003	Mathematics	13.0
2	DE0347	Supplementary Mathematics (for electrical engineering)	3.0
3	DA0101	Physics	9.0
4	DE0300	Probability Theory and Mathematical Statistics	3.0
5	SD0003	Innovative Product Development and Entrepreneurship	6.0
6	DE0344	Introduction to Electronics and Telecommunications Branch	6.0
7	IV0759	Civil Protection	2.0
8	DE0359	Telecommunications Systems	9.0
9	DE0177	Digital Electronics and Computer Architecture	5.0
10	DE0048	Digital Devices and Systems	4.0
11	DE0350	Digital Devices of Telecommunications Systems	6.0
12	DE0357	Telecommunications Theory	9.0
13	DE0353	Transmission Systems	9.0
14	DE0349	Transmission Media	9.0
15	DE0049	Telecommunications and Computer Networks	4.0
16	DA0055	Environment and Climate Roadmap	2.0
17	DE1021	Electronic Communications Services and Measurements	9.0
<b>B</b>		<b>Compulsory Elective Study Courses</b>	<b>51.0</b>
<b>B.1</b>		<b>Study courses on the current achievements in the field</b>	<b>44.0</b>
1	DE0363	Teletraffic Theory	6.0
2	DE0078	Distributed Systems in Telecommunications	4.0
3	DE0193	Fundamentals of Circuit Theory	5.0
4	DE0348	Electricity and Magnetism	3.0
5	DE0354	Fundamentals of Materials Science	3.0
6	DE0202	Electron Devices	5.0
7	DE0083	Semiconductor Devices	4.0
8	DE0345	The Basics of Control Theory	3.0
9	DE0362	The C Programming Language	3.0
10	DE0358	Research Seminars in the Field of Telecommunications	6.0
11	DE0201	Computer Studies (basic course)	5.0
12	DE0069	Computerization of Mathematical Tasks in Electrical Engineering	4.0
13	DE0064	Computer Technologies in Research	4.0
14	DE0346	Computer Networks	3.0
15	DE0343	Real-Time Communication Systems (study project)	3.0
16	DE0361	Introduction to Computers and Algorithms	3.0
17	DE0182	Network Databases and Databanks	5.0
18	DE0084	Network Reliability	4.0
19	DE0086	Computer Network Monitoring, Diagnostics and Maintenance	4.0
20	DE0355	Mobile Network Architecture	6.0
21	DE0351	Fundamentals of DC Circuits	3.0
22	DE0189	Fundamentals of AC Circuits	5.0
23	DE0192	Computer Technologies in Telecommunications	5.0
24	DE0360	Digital Switching Systems	6.0
<b>B.2</b>		<b>Humanities and Social Sciences Study Courses</b>	<b>3.0</b>
1	DE0279	United Europe and Latvia	3.0
2	DE0295	Political System of Latvia	3.0
3	DE0259	Sociology of Personalities and Small Groups	3.0
4	DE0258	Sociology of Management	3.0
5	DE0309	General Sociology	3.0
6	DE0260	Basics of Communication	3.0
<b>B6</b>		<b>Languages</b>	<b>4.0</b>
1	DE0040	The Terminology Minimum in English	4.0
2	DE0338	The German Language	3.0
3	DE0141	The German Language	2.0
<b>C</b>		<b>Free Elective Study Courses</b>	<b>6.0</b>
<b>E</b>		<b>Final Examination</b>	<b>15.0</b>
1	DE0352	Bachelor Thesis	15.0