RĪGAS TEHNISKĀ UNIVERSITĀTE

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Study programme "Computer Systems"

Main attributes

Title	Computer Systems
Identification code	DBD0
Education classification code	43483
Level and type	First-Cycle Higher Education (Academic Bachelor) Studies
Higher education study field	Information Technology, Computer Engineering, Electronics, Telecommunications, Computer Control and Computer Science
Head of the study field	Agris Ņikitenko
Deputy head of the study field	Jurģis Poriņš
Department responsible	Faculty of Computer Science, Information Technology and Energy
Head of the study programme	Egons Lavendelis
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's degree of engineering science in computer systems
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 academic bachelor study programme “Computer Systems” (180 credit points) provides studies in one of the engineering fields – computer systems. The studies are 3 years long and students acquire basic knowledge in computer science for their future studies or for practical work in the area of information and communication technologies. Mathematics, physics, computer science and programming study courses including Applied Software Automation Tools, Data Structures, Introduction to Computer Architecture, Fundamentals of Computer Graphics and Image Processing, Fundamentals of Computer Simulation and Modelling, Database Management Systems provide theoretical basis. In the area of computer science students learn Operating Systems, Computer Organization and Networks, Algorithms and Methods of Programming, Systems Analysis and Design, Technology of Large Databases and Fundamentals of Artificial Intelligence. In the area of software engineering students acquire knowledge of Programming Languages, Software Engineering Technologies and Tools. Thus, theoretical knowledge is combined with application skills. The study programme includes mandatory study courses (86 credit points), including study courses of specialization, study courses of general education and humanitarian/social science study courses, restricted electives (20 credit points from which 15 credit points are for study courses of specialization). Free electives have 4 credit points, and bachelor thesis 10 credit points. The specific character of this study programme is the possibility for graduates to continue their studies in the academic master or professional master study programme “Computer Systems”..
Aim	The aim of the study programme is to prepare professionals for starting independent work in the field of informatics with knowledge in software engineering, research and solving computer engineering problems, computer systems development, systems analysis and modelling, fundamentals of database technologies and artificial intelligence, as well as with the ability to demonstrate systems thinking and/or systems approach and participate in a software development project, fulfilling different roles, who demonstrate professional ethics and knowledge/skills complying with IT industry standards. Prepare students for the continuation of studies both at professional (fulfilling additional requirements) and academic master studies level.
Tasks	The tasks of the study programme: - to provide knowledge in mathematics and physics in accordance with the highest technical engineering education requirements; - to provide basic knowledge in computer science, focusing on software engineering, computer systems development, database technologies, systems analysis and fundamentals of artificial intelligence; - to develop students' practical abilities to work with various software; - to practice students in programming and professional use of computers; - to develop students' ability to independently acquire, evaluate and use new software products; - to improve the students' professional skills in foreign languages; - to introduce students with the professional ethics and its industry standards; - to improve students' oral and written communication skills as well as to develop student's skills in teamwork; - to provide the initial scientific research skills, developing Bachelor Thesis.

Learning outcomes	Graduate of the study programme: - has acquired knowledge in computer science in general and its formal basis; - is able to choose the appropriate algorithms (including artificial intelligence based), methods, software products and tools for solving problems; - is able to use software development environments and tools as well as to develop - software according to the best praxis and standards of the IT sector; - is able to study professional literature in Latvian and a foreign language as well as to use professional terminology in the state language; - is able to participate in project development, management, and work in a team, manage, plan and coordinate the working group following the interests of the society as a whole and principles of sustainable development; - is able to plan independently work activities.
Final/state examination procedure, assessment	To receive the bachelor degree of engineering science in computer systems, students must accomplish the syllabus and work out and defend their Bachelor Thesis. The volume of the Bachelor Thesis is 10 credit points. Bachelor Thesis must be publicly defended, and a reviewer is appointed for its evaluation. The guidelines for contents and evaluation criteria are described in “Requirements for the final thesis of the academic bachelor's study program at the Institute of Applied Computer Systems”.
Description of the future employment	Graduates can start working in information technology companies (or in IT departments of other companies) within software development projects playing a variety of roles such as programmers, tester, technical writers.
Special enrollment requirements	English language proficiency equivalent to at least CEFR B2 level.
Opportunity to continue studies	Graduates of the study programme can continue studies at academic master and professional master (fulfilling additional requirements) study programmes.

Courses

No	Code	Name	Credit points
A		**Compulsory Study Courses**	**129.0**
1	DE0028	Mathematics	13.0
2	DE0132	Discrete Mathematics	5.0
3	DA0101	Physics	9.0
4	IV0759	Civil Protection	2.0
5	DE0133	Discrete Structures of Computer Science	5.0
6	DE0283	Database Management Systems	6.0
7	DE0008	Object-Oriented Programming	4.0
8	DE0012	Introduction to Operations Research	4.0
9	DE0136	Fundamentals of Computer Simulation and Modelling	5.0
10	DE0010	Introduction to Computer Architecture	4.0
11	DE0278	Numerical Methods	3.0
12	DE0013	Operating Systems	4.0
13	DE0130	Computer Networks	5.0
14	DE0144	Fundamentals of Artificial Intelligence	5.0
15	DE0034	Basics of Computer Control	4.0
16	DE0016	Computer Organization and Assembly Language	4.0
17	DE0292	Data Models in Database Systems	3.0
18	DE0284	Software Engineering	3.0
19	DE0285	Systems Analysis and Knowledge Acquisition	3.0
20	DE0027	Introduction to Study Field	1.0
21	SD0003	Innovative Product Development and Entrepreneurship	6.0
22	DA0055	Environment and Climate Roadmap	2.0
23	DE0916	Probability, Random Processes and Statistics for Engineers	6.0
24	DE0915	Algorithmization and Programming of Solutions	8.0
25	DE0917	Programming Languages	5.0
26	DE0918	Data Structures and Algorithms	7.0
27	DE0332	Introduction to Image Processing	3.0
B		**Compulsory Elective Study Courses**	**30.0**
B1		**Field-Specific Study Courses**	**23.0**
1	DE0297	Adaptive Data Processing Systems	3.0
2	DE0281	Functional Programming	3.0
3	DE0301	Methods of Systems Theory	3.0
4	DE0286	System Engineering	3.0
5	DE0135	Software Evolution Technologies	5.0
6	DE0275	Algorithms and Methods of Programming	3.0
7	DE0299	Fundamentals of Computer Systems Design	3.0
8	DE0276	Applied System Software	3.0
9	DE0290	Software Testing Technologies and Principles	3.0
10	DE0277	Parallel Database Systems	3.0
11	DE0296	Automated Functional and Load Testing of Web Solutions	6.0
12	DE0282	Continuous Automation of Software Server Tests	6.0
13	DE0280	Multithreading in Software	3.0
B2		**Humanities and Social Sciences Study Courses**	**3.0**
1	DE0288	Politology	3.0
2	DE0295	Political System of Latvia	3.0
3	DE0279	United Europe and Latvia	3.0
B6		**Languages**	**4.0**
1	DE0040	The Terminology Minimum in English	4.0
2	DE0037	The terminology minimum in German	4.0
C		**Free Elective Study Courses**	**6.0**
E		**Final Examination**	**15.0**
1	DE0294	Bachelor Thesis	15.0