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RĪGAS TEHNISKĀ UNIVERSITĀTE

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Study programme "Computer Systems"

Main attributes

Title	Computer Systems
Identification code	DMD0
Education classification code	45483
Level and type	Academic Master (Second Cycle) 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)	120.0
Duration of studies (years)	Full time studies - 2,0
Degree or/and qualification to be obtained	Master degree of engineering science in computer systems
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	First cycle higher education in computer control and computer science, computer systems, information technology, intelligent robotic systems, electrical science, mathematics, physics or comparable education

Description

Abstract	The study programme (120 credit points) is 2 years long and provides students with advanced knowledge in computer science with focus on modelling and development of computer systems, software engineering and systems theory and analysis. Labs, practical and individual works allow acquiring practical skills for development of the whole spectrum of computer systems, in particular information, database, intelligent and software systems. The important part of the study programme is scientific seminars where students supervised by professors acquire research and result presentation skills. There are 2 concentration areas: 1) artificial intelligence and data analytics, 2) computer systems for industry. In each direction of specialization, students take five advanced study courses. The volume of the Master Thesis is 30 credit points which are divided as follows: 6 credit points during the first study year and 24 credit points during the second study year. Such division allows to start working out a Master Thesis and to ensure the quality of the paper.
Aim	The aim of the study programme is to prepare specialists with deep knowledge in computer science, software engineering, computer systems development theory, database technologies, programming languages, software development environments and artificial intelligence, as well as with the ability to participate in software development project, fulfilling different (including manager) roles and complying with IT industry standards and professional ethics. To prepare students so that after graduation they could start working in the university, scientific research organizations, fulfil professional duties at IT companies, as well as continue studies at doctoral study programme.
Tasks	Tasks of the study programme: - to provide deep knowledge in computer science, focusing on software engineering, computer system development and system analysis, as well as in artificial intelligence methods and modern database technologies; - to provide knowledge about the recent findings in computer science that provides the basis for creative thinking; - to develop students' scientific analysis capabilities, pedagogical skills, and ability to solve problems independently, to continue studies in the doctoral study programme and to promote their involvement in scientific problem solving; - to strengthen students' abilities of independently improving their professional knowledge and skills; - to develop students' skills to professionally work with complex computer systems' development environments and tools, as well as critically evaluate them and choose the most appropriate for solving different tasks; - to provide knowledge and skills that are necessary for project and team management; - to improve students' oral and written communication skills as well as to improve students' skills in team work; - to improve scientific research skills by developing Master Thesis.

Learning outcomes	Graduate of the study programme: - is able to independently define and critically analyse scientific and professional problems; - is able to carry out scientific research, define and justify its results; - is able to professionally adapt, to acquire new research methods and technologies; - is able to professionally draw up, submit and present scientific research results; - is able to participate in research projects and assist in pedagogical work; - is able to prepare scientific papers and conference presentations; - is able to professionally use complex environments and tools for systems analysis and modeling, and/or software development tasks; - is able to choose the appropriate software products, tools and methods (including artificial intelligence methods) for solving problems; - is able to implement and apply theoretical concepts of computer science; - is able to organize and manage a group of software developers, analyse work results; - is able to improve independently their competencies; - is able to perform innovations in software engineering industry.
Final/state examination procedure, assessment	To receive the academic degree of master of engineering in computer systems, students must accomplish the syllabus and work out and defend their Master Thesis. The volume of the Master Thesis is 30 credit points, which are divided as follows: 6 credit points during the first study year and 24 credit points during the second study year. Master Thesis must be defended publicly in front of thesis definition committee where the student presents his/her thesis and answers the questions asked by the committee, reviewer and general audience. A reviewer with doctoral degree is appointed for the evaluation of the thesis. The guidelines for contents and public defence are laid out in "Instructions for working out Master Thesis" published by 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 system analysts, architects and designers, programmers, test engineers, technical writers, and managing development teams and projects. The graduates are ready to continue research work at scientific institutions.
Special enrollment requirements	English language proficiency equivalent to at least CEFR B2 level.
Opportunity to continue studies	Graduates of this study programme can continue studies at the doctoral study level.

Courses

No	Code	Name	Credit points
A		**Compulsory Study Courses**	**48.0**
1	DE0478	Artificial Intelligence	6.0
2	DE0773	Testing and Software Quality	6.0
3	DE0759	Evolution of Object-Oriented Software	6.0
4	DE0767	Requirements Engineering	6.0
5	DE0936	Specialized database technologies	6.0
6	DE0935	Computer Systems Scientific Seminar	6.0
7	DE0937	Machine Learning Algorithms	6.0
8	DE0938	Software Development Project Management Methods	6.0
B		**Compulsory Elective Study Courses**	**36.0**
B1		**Field-Specific Study Courses**	**30.0**
		Artificial Intelligence and Data Analytics	*30.0*
1	DE0939	Information Retrieval	6.0
2	DE0940	Business Analytics with Machine Learning	6.0
3	DE0941	Deep Machine Learning	6.0
4	DE0947	Natural Language Processing	6.0
5	DE0942	Computer Vision	6.0
		Computer Systems for Industry	*30.0*
1	DE0943	Software for Internet of Things	6.0
2	DE0922	High-Level Software Design	6.0
3	DE0944	Parallel functional programming	6.0
4	DE0946	Control of Cyber-Physical Systems	6.0
5	DE0945	Model-Based Systems Engineering	6.0
6	DE0948	Secure Computer Networks Systems	6.0
B2		**Humanities and Social Sciences Study Courses**	**6.0**
1	DE0544	Industrial Relations	3.0
2	DE0425	Business Sociology	3.0
3	DE0386	Social Psychology	3.0
4	DE0694	Ethics	3.0
5	DE0388	Presentation Skills	3.0
6	DE0643	Pedagogy	3.0
7	DE0653	Psychology	3.0
C		**Free Elective Study Courses**	**6.0**
E		**Final Examination**	**30.0**
1	DE0912	Master Thesis	30.0