Higher Education Institution (name in original language and in English)	**Latvijas Universitāte (University of Latvia)**
Country	Latvia
State/Province (where applicable)	Riga
Name of the Programme (name in original language and in English)	**Datorzinātnes [Computer Science]**
Degree Awarded	Master
Qualification Level (First Cycle / Second Cycle)	Second cycle
Programme Objectives; Profile (where applicable)	For the Master programme in Computer Science, seven areas of specialisation ("sub-programmes") are offered: Computer Science, Software Engineering, Information Technologies, Information Systems, Computer Engineering, Bioinformatics, or Advanced Programming. The University states that depending on the chosen sub-programme, the graduates of the programme are specialists who are able: • to model and analyse large and complex systems; • to develop large and complex software systems, information systems and computer networks; • to manage large projects and specialist groups; • to follow the development of information technologies and quickly learn about new technologies and products; • to get involved in research and training.
Programme Duration (Semesters; in case of "terms" of different length, indicate them and the equivalent in semesters)	4 Semesters or 2 semesters (for graduates of 4-years Bachelor's Degree programme Computer Science only)
Total Number of ECTS Credits Awarded	120 ECTS 60 ECTS (if only 2 semesters)
Brief Description of the Programme	The curriculum of the Master's Programme in Computer Science is composed of mandatory modules including a final Master Thesis, mandatory modules according to the chosen specialization, as well as free electives from the computing area. Master's students can choose one out of seven specialisations, in accordance with the specialisations that are offered at Bachelor's level: 1. Computer Science – research and academic; 2. Software Engineering – leading programmers and software project managers; 3. Information Technologies – leading computer network specialists and project managers; 4. Information Systems – leading database and information systems specialists and project managers; 5. Computer Engineering – leading specialists and project managers of embedded systems. 6. Bioinformatics – leading specialists in bioinformatics 7. Advanced Programming (AP) – developers and programmers of complicated algorithms

	The structure for each of the specialisations at Master's level varies slightly over the semesters with a view to the number of mandatory courses for each of the specialisations and the electives from the computing area.
Examples of Very Good Practice (where applicable)	The strong cooperation with industry that the University has built and the further development of the programme including the introduction of new specialisations was found to be very positive. Furthermore, it was found that students feel well prepared for the job market, and industry confirms that graduates have a very high level of knowledge and skills. In general, a high level of satisfaction was found among the relevant stakeholders (students, lecturers, employers).
Accredited without / with Adjustment Requirements	Accredited <u>without</u> Adjustment Requirements
Adjustment Requirements (where applicable)	**Recommendations** 1. It is recommended to review the module descriptions regarding contents, titles and objectives. 2. It is recommended to improve the cooperation of the teaching staff regarding the composition and development of the curricula. 3. It is recommended to review the assigned amount of credits to each module. 4. It is recommended to provide format templates for the graduation theses. 5. It is recommended to improve transparency with regard to grading, especially for final theses. 6. It is recommend to implement an onboarding process, especially for external Bachelor graduates
Accredited by (agency, country)	EQANIE – European Quality Assurance Network in Informatics Education
Accredited (from ... to …)	From 13 December 2024 to 30 September 2030

Decision on the award of the

Euro-Inf® Label

Bachelor‘s & Masters’s degree programmes
Computer Science

Provided by
University of Latvia

Documentation of the decision made in addition to a prior accreditation in accordance with the European Standards and Guidelines

Version: 13 December 2024

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A Requested labels

English Name of the degree programme	Prior accreditation in accordance with ESG
Ba Computer Science	Euro-Inf Label EQANIE 15.6.2017 – 30.09.2023
Ma Computer Science	Euro-Inf Label EQANIE 15.6.2017 – 30.09.2023
Type of procedure: Decision made in addition to a prior national accreditation	
Expert panel: Prof. Dr. Rüdiger Reischuk, University of Lübeck, Prof. Dr. James Davenport, University of Bath, Gerhard Wächter, Industry Representative - Manamak GmbH, Justīne Širina, student at Ventspils University of Applied Sciences	
Representative of the EQANIE headquarter: David Witt	
Responsible decision-making body: Accreditation Committee - EQANIE	
Criteria used: European Standards and Guidelines as of 15 May 2015 Euro-Inf framework standards and accreditation criteria for informatics degree programmes as of 23 October 2017[1]	

[1] http://eqanie.eu/wp-content/uploads/2019/09/Euro-Inf_Framework_Standards_and_Accreditation_Criteria_V_2017-10-23.pdf.

B Characteristics of the degree programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialisation	c) Corresponding level of the EQF[2]	f) Duration	g) Credits
Computer Science	B.Sc.	CS – Computer Science CE – Computer Engineering SE – Software Engineering IT – Information Technologies IS - Information Systems CD – Mathematics and computer science didactics	6	8 semesters	240 ECTS/160 Latvian Credits
Computer Science	M.Sc.		7	2 semesters / 4 semesters	60 ECTS/40 Latvian Credits 120 ECTS/80 Latvian Credits

[2] EQF = The European Qualifications Framework for lifelong learning

C Assessment of the expert panel

Bachelor's degree programme Computer Science

Profile of the degree programme

In its Self-assessment report, the University of Latvia describes the structure of the Bachelor's degree programme Computer Science as follows: "The Bachelor's study programme is divided into specializations, where each specialization is defined by sets of limited elective courses that determine the specific of the respective specialization. The specializations names and content […] are based on ACM Computing Curricula recommendations. Pursuant to the previous accreditation the Bachelor's programme in Computer Science consisted of 6 specializations in the reporting period:

- CS – Computer Science (researchers and lecturers),
- CE – Computer Engineering (specialists in embedded software, sensor networks),
- SE – Software Engineering (programmers and software project managers),
- IT – Information Technologies (computer network specialists and project managers),
- IS - Information Systems (database and information systems specialists and project managers),
- CD – Mathematics and computer science didactics (teachers of mathematics and computer science).

[…] The languages of instruction in the study programme are planned to be Latvian and English [and] a part-time plan has been developed and is planned to be implemented for the most requested specialization – Software Engineering. […] The duration of the study programme is 4 years (160 credit points respectively). The Bachelor's study programme is integrated with the 1st level professional study programme 'Programming and computer network administration' with a duration of 2.5 years. The content of the first two years of the studies is created by harmonizing the study courses of the Bachelor's programme and the 1st level professional programme. This is followed by Internship (17 CP), since it is included in the 1st level professional programme. It should be noted that the study plan includes study courses Internship I and Internship II in the amount of 18 CP in total, where 1 CP is intended for face-to-face lessons at the University of Latvia on the issues of the internship, while internship in industry, which is covered by the Internship Regulations, is in the amount of 17 CP. The inclusion of extensive internship in the Bachelor's programme is justified by the fact that it is performed in various companies of the IT industry and provides

the opportunity to gain valuable practical experience corresponding to the interests of each student. At the same time, it is possible to learn the latest and current technologies for companies, to get acquainted with the tasks that companies solve and work in project teams, as well as to gain an insight into how the knowledge acquired in previous studies can be applied practically. After completing the internship, students of the specializations CS, SE, IT, IS, CE are given the opportunity to defend their qualification thesis and receive a diploma for first-level professional higher education and one of two 4th level professional qualifications – Programmer or Computer Systems and Computer Networks Administrator. If the students of the mentioned specializations do not choose to receive a diploma for first-level professional higher education, they defend the qualification project instead of the qualification thesis. The Bachelor's study programme is divided into specializations, where each specialization is actually defined by sets of limited elective courses that determine the specific of the respective specialization. 3 semesters in the 3rd and 4th year of the studies are planned for the completion of the specific elective courses of the specializations. Students of the Bachelor's programme must choose one of the specializations – the initial choice is made at the beginning of the 2nd semester, but later, at the beginning of the 6th semester, when the specializations' specific courses are mainly offered, the specialization can be changed to another, based on the previous experience gained in the internship and according to individual student interests. Within the Computer Science [Lincoln] specialization, the choice is made as early as when entering the 1st year; it is implemented in English."

Learning outcomes of the graduates

The assessment of the bachelor's degree programme Computer Science is mainly based on a comparison of the learning outcomes and the curriculum with the programme outcomes as defined by the Euro-Inf Framework Standards.

EIFS	Contained/reflected in overall programme/ learning outcomes?	Achieved in which courses?	Fulfilled
Underlying Conceptual Basis for Informatics Graduates of a First Cycle degree should be able to: • describe and explain the essential facts, concepts, theories and mathematical methods relevant to computing,	☒ yes ☐ no	• Web Technologies I, • Automata Theory, • Operating Systems, • Databases and Information Systems Fundamentals, • Computer Architecture and computer engineering fundamentals I,	☒

computing equipment, computer communication and informatics applications as appropriate to their programme of study • outline the characteristics of relevant state-of-the-art hardware and software and their practical application • outline relevant historical and current developments in informatics and show in-sight into possible future trends and developments • apply and integrate knowledge and understanding of other informatics disciplines in support of study in their own specialist area(s) • demonstrate awareness of the need for deep domain knowledge when creating informatics applications in other subject areas		• Algorithms and Programming, • Software development fundamentals, • Computer networks I and insight into industry, • Web Technologies II, • Formal Grammars, • Software Engineering, • Qualification Project, • Mathematical Logic, • Bachelor paper in Computer Science, • Discrete mathematics for computing, • Communication and Cognitive Sciences, • Algebra, • Calculus I, • Analytical geometry, • Probability Theory and Statistics, • Internet, Netiquette And The Legal Regulation, • Seminar I, • Computer Architecture and computer engineering fundamentals II, • Theory of Algorithms, • Course Paper in Computer Science, • Wireless Sensor Networks, • Digital Signal Processing, • Introduction to Digital Design, • Linux System programming, • Modeling basics, • Principles of Assembly Languages, • Operating System Concepts, • Coding Theory, • Calculus II, • Introduction to Web Design, • Computer Networks II, • Foundations of Specification Languages,	

		• Graphic Design for User Interface, • Introduction to Natural Language Processing, • Parallel programming, • Office Information Systems, • Seminar II, • Syntax and Semantics of Programming Languages, • Computer Networks Administration, • RouterOS fundamental technologies, • Business platforms, • Software Requirement Analysis, • Human - computer interaction, • Oracle Design Tools, • Information Systems Security, • Software Testing, • Databases II, • Data Warehouses, • Database practice, • Seminar III, • Computer Networks III, • Computer Networks IV, • AB Suite Programming Environment, • Basics of Computer Graphics and Image Processing, • Internet search techniques, • Data structures and algorithms, • Applied deep learning, • Course Paper in Computer Science, • Machine learning, • Programming Languages, • Object-oriented programming, • Applied Algorithms, • RDBMS Oracle, • Complexity of Computation, • Quantum Computation, • Seminar IV,	

		• Cross-Platform Development, • Big Data, • Elements of graph theory, • Linear Algebra I, • Linear Algebra II, • Combinatorics, • Theory of Probability and Mathematical Statistics selected topics, • Main Notions of Mathematics, • English for Computing	
Analysis Graduates of a First Cycle degree should be able to: • use a range of techniques to identify the requirements of real-world problems, analyse their complexity and assess the feasibility of their solution using informatics techniques • describe a problem and its solution at varying levels of abstraction • select and use relevant analytic, modelling and simulation methods • choose appropriate solution patterns, algorithms and data structures • analyse the extent to which an informatics system meets the criteria defined for its current use and future development	☒ yes ☐ no	• Web Technologies I, • Automata Theory, • Operating Systems, • Databases and Information Systems Fundamentals, • Algorithms and Programming, • Software development fundamentals, • Computer networks I and insight into industry, • Web Technologies II, • Formal Grammars, • Software Engineering, • Qualification Project, • Mathematical Logic, • Bachelor paper in Computer Science, • Practice I, • Practice II, • Discrete mathematics for computing, • Communication and Cognitive Sciences, • Algebra, • Calculus I, • Analytical geometry, • Probability Theory and Statistics, • Introduction to management, Seminar I, • Theory of Algorithms, • Course Paper in Computer Science, • Wireless Sensor Networks, • Digital Signal Processing, • Introduction to Digital Design, • Linux System programming, • Modeling basics,	☒

		• Principles of Assembly Languages, • Operating System Concepts, • Coding Theory, • Calculus II, • Computer Networks II, • Foundations of Specification Languages, • Software development using .NET, • Graphic Design for User Interface, • Introduction to Natural Language Processing, • Parallel programming, • Seminar II, • Syntax and Semantics of Programming Languages, • Computer Networks Administration, • RouterOS fundamental technologies, • Business platforms, • Software Requirement Analysis, • Human - computer interaction, • Oracle Design Tools, • Software Testing, • Databases II, • Data Warehouses, • Seminar III, • Computer Networks III, • Computer Networks IV, • AB Suite Programming Environment, • Semantic Web, • Basics of Computer Graphics and Image Processing, • Applied cryptograpfy, • Internet search techniques, • Data structures and algorithms, • Applied deep learning, • Course Paper in Computer Science, • Cloud computing, • Cyber Security, • Machine learning, • Programming Languages, • Object-oriented programming, • Applied Algorithms, • RDBMS Oracle, • Complexity of Computation,	

		• Quantum Computation, • Seminar IV, • Cross-Platform Development, • Big Data, • Elements of graph theory, • Linear Algebra I, • Linear Algebra II, • Combinatorics, • Theory of Probability and Mathematical Statistics selected topics, • Main Notions of Mathematics,	
Design and Implementation Graduates of a First Cycle degree should be able to: • specify and design computing/network hardware/software which meet specified requirements • describe the phases involved in different life cycle models used for specifying, building, testing and commissioning new systems and for maintaining existing systems • select and use appropriate process models, programming environments and data management techniques for projects involving traditional applications as well as emerging application areas • describe and explain the design of systems and interfaces for human-computer and computer-computer interaction • apply relevant practical and programming skills to the creation of computer pro-grams and/or other informatics artefacts	☒ yes ☐ no	• Web Technologies I, • Operating Systems, • Databases and Information Systems Fundamentals, • Algorithms and Programming, • Software development fundamentals, • Computer networks I and insight into industry, • Web Technologies II, • Software Engineering, • Qualification Project, • Bachelor paper in Computer Science, • Practice I, • Practice II, • Communication and Cognitive Sciences, • Seminar I, • Wireless Sensor Networks, • Digital Signal Processing**,** • Introduction to Digital Design, • Linux System programming, • Modeling basics, • Principles of Assembly Languages, • Coding Theory, • Introduction to Web Design, • Computer Networks II, • Foundations of Specification Languages, • Software development using .NET, • Graphic Design for User Interface, • Introduction to Natural Language Processing, • Parallel programming, • Office Information Systems,	☒

		• Seminar II, • Syntax and Semantics of Programming Languages, • Computer Networks Administration, • RouterOS fundamental technologies, • Business platforms, • Software Requirement Analysis, • Human - computer interaction, • Oracle Design Tools, • Software Testing, • Databases II, • Data Warehouses, • Database practice, • Seminar III, • Computer Networks III, • Computer Networks IV, • AB Suite Programming Environment, • Semantic Web, • Basics of Computer Graphics and Image Processing, • Applied cryptograpfy, • Internet search techniques, • Data structures and algorithms, • Applied deep learning, • Cloud computing, Cyber Security, • Machine learning, • Programming Languages, • Object-oriented programming, • Applied Algorithms, • RDBMS Oracle, • Seminar IV, • Cross-Platform Development, • Big Data	
Economic, legal, social, ethical and environmental context Graduates of a First Cycle degree should be able to: • demonstrate awareness of the need for a high level of professional and ethical conduct in informatics and a knowledge of professional codes of conduct	☒ yes ☐ no	• Databases and Information Systems Fundamentals, • Computer networks I and insight into industry, • Software Engineering, • Qualification Project, • Bachelor paper in Computer Science, • Principles of Economics, • Communication and Cognitive Sciences, • Civil protection,	☒

• explain how commercial, industrial, economic and social contexts affect informatics practice • identify relevant legal requirements governing informatics activities, including data protection, intellectual property rights, contracts, product safety and liability issues, personnel issues and health & safety • explain the importance of information privacy and security issues in relation to the design, development, maintenance, monitoring and use of informatics-based systems		• Internet, Netiquette And The Legal Regulation, • Introduction to management, • Environment protection, • Seminar I, • Wireless Sensor Networks, • Linux System programming, • Operating System Concepts, • Seminar II, • Computer Networks Administration, • Business platforms, • Software Requirement Analysis, • Human - computer interaction, • Information Systems Security, • Software Testing, • Databases II, • Seminar III, • AB Suite Programming Environment, • Applied cryptograpfy, • Cloud computing, • Cyber Security, • Object-oriented programming, • Seminar IV	
Informatics practice Graduates of a First Cycle degree should be able to: • demonstrate an awareness of appropriate codes of practice and industry standards • describe and explain management techniques appropriate to the design, implementation, testing, deployment and maintenance of informatics systems, including project management, configuration management, change management, etc., and including relevant automated techniques • identify risk issues, including security, health & safety, environmental and commercial	☒ yes ☐ no	• Databases and Information Systems Fundamentals, • Computer networks I and insight into industry, • Software Engineering, • Qualification Project, • Bachelor paper in Computer Science, • Practice I, • Practice II, • Discrete mathematics for computing, • Communication and Cognitive Sciences, • Civil protection, • Internet, Netiquette And The Legal Regulation, • Environment protection, • Seminar I, • Course Paper in Computer Science, • Wireless Sensor Networks, • Digital Signal Processing, • Introduction to Digital Design,	☒

risk, and explain risk assessment, risk reduction and risk management techniques • undertake literature searches and reviews using databases and other sources of information • design and conduct appropriate practical investigations (e.g. of system performance), to interpret data and draw conclusions		• Principles of Assembly Languages, • Computer Networks II, • Office Information Systems, • Seminar II, • Computer Networks Administration, • RouterOS fundamental technologies, • Human - computer interaction, • Information Systems Security, • Software Testing, • Databases II, • Database practice, • Seminar III, • Computer Networks III, • Computer Networks IV, • AB Suite Programming Environment, • Applied cryptograpfy, • Data structures and algorithms, • Applied deep learning, • Course Paper in Computer Science, • Cyber Security, • Machine learning, • Object-oriented programming, • Seminar IV, • Linear Algebra I, • Linear Algebra II, • Combinatorics	
Other Professional Skills and Competences Graduates of a First Cycle degree should be able to: • organise their own work independently, demonstrate initiative and exercise personal responsibility • communicate effectively both verbally and using a variety of communications media to a variety of different audiences • plan self-learning and improve personal performance	☒ yes ☐ no	• Operating Systems, • Computer Architecture and computer engineering fundamentals I, • Computer networks I and insight into industry, • Web Technologies II, • Software Engineering, • Qualification Project, • Bachelor paper in Computer Science, • Practice I, • Practice II, • Discrete mathematics for computing, • Communication and Cognitive Sciences, • Civil protection,	☒

as a foundation for lifelong learning and ongoing professional development • identify different ways of organising teams and the various roles within a team • participate effectively in informatics group-working		• Internet, Netiquette And The Legal Regulation, • Introduction to management, • Environment protection, • Seminar I, • Computer Architecture and computer engineering fundamentals II, • Course Paper in Computer Science, • Wireless Sensor Networks, • Digital Signal Processing**,** • Introduction to Digital Design, • Linux System programming, • Modeling basics, • Introduction to Web Design, • Computer Networks II, • Software development using .NET, • Graphic Design for User Interface, • Office Information Systems, • Seminar II, • RouterOS fundamental technologies, • Software Requirement Analysis, • Human - computer interaction, • Information Systems Security, • Software Testing, • Databases II, • Seminar III, • Computer Networks III, • Computer Networks IV, • AB Suite Programming Environment, • Semantic Web, • Applied cryptograpfy, • Internet search techniques, • Data structures and algorithms, • Course Paper in Computer Science, • Programming Languages, • Object-oriented programming, • Seminar IV, • English for Computing	

The **provided final theses** demonstrate that the students achieve the intended learning outcomes and are able to work independently on a task at the required level (EQF-level 6).

About the General Criteria of the Euro-Inf Framework Standards

Based on the analysis carried out in the national reference accreditation report and their own review of the documents and the audit discussion rounds, the experts consider the general criteria for the award of the Euro-Inf label fulfilled.

Master's degree programme Computer Science

Profile of the degree programme

The University of Latvia provides the following information on the Master's degree programme Computer Science regarding its structure and objectives: The university defines that "[t]he objective of the Master's study programme in Computer Science is to prepare highly qualified export-capable IT specialists and managers for practical work in business companies and state institutions, to provide the industry with academically educated specialists prepared for scientific and pedagogical work in the six sub-programmes (branches of study). The goal and the achievable learning outcomes defined for the programme enable to ensure a set of knowledge, skills and competence in compliance with level 7 knowledge, skills and competence of the framework structure determined in the Latvian education classification. […] The programme envisions two-year full-time studies in the amount of 80 CP, three-year part-time studies in the amount of 80 CP. One-year full-time studies in the amount of 40 CP are also planned in which graduates of four-year bachelor's programmes in computer science will be admitted. In all of variants 20 CP are ascribed to master's thesis. […] The compulsory part of the 80 CP variants of the programme is 24 CP. In addition, each specialisation has its own specific compulsory part – from 12 CP to 34 CP. This leaves 22 CP to 0 CP for the limited elective part of the specialisations. The optional part of the programme is 2 CP. The compulsory part of the 40 CP variant is 12 CP. In all versions, development of a master's thesis is worth 20 CP."

Learning outcomes of the graduates

The assessment of the master's degree programme Computer Science is mainly based on a comparison of the learning outcomes and the curriculum with the programme outcomes as defined by the Euro-Inf Framework Standards.

EIFS	Contained/reflected in overall programme/ learning outcomes?	Achieved in which courses?	Fulfilled
Underlying Conceptual Basis for Informatics Graduates of a Second Cycle degree should be able to: • demonstrate either deepened knowledge of a chosen specialisation or broadened	☒ yes ☐ no	• Design and analysis of efficient algorithms, • Web programming, Computer networks I, • System design, Computer networks II, • Software testing, • Knowledge engineering, • Image processing and analysis, • Graph theory,	☒

knowledge of informatics in general • explain in depth relevant concepts and scientific principles appropriate to their programme of study, some of which may be from outside informatics • demonstrate awareness of topics at the forefront of their specialisation and evaluate their significance		• Modern programming technologies, • Quantum computers, • Enterprise information systems, • Randomized algorithms, • Number theory, • Parallel algorithms, • Game theory, • E-commerce and ICT Infrastructure, • Selected Topics of Visual Communication Design, • UNIX operating system, • Software quality, • Specification languages, • Applied cryptography, • Master's course paper in computer science, • Bioinformatics, • Selected Topics about Data Warehouses, • Deep Learning, • Big data technologies, • IT project management, • Computer security and vulnerabilities, • Practical combinatorial optimization, • Blockchain for Business, • Quantum algorithms, • Virtual Environments, • Wireless sensor networks, • Data mining algorithms, • Mathematical Foundations of Cryptography, • Program correctness, • Combinatorics, • Mathematics for computer science I, • Mathematics for computer science II, • Selected topics in mathematical statistics for computer science	
Analysis Graduates of a Second Cycle degree should be able to: • apply appropriate analysis methods to the solution of	☒ yes ☐ no	• Design and analysis of efficient algorithms, • Web programming, • Computer networks I, • System design, • Computer networks II,	☒

complex problems in informatics and to assess their limitations • use fundamental knowledge to investigate new and emerging technologies and methodologies • collect and analyse research data and use appropriate analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of analytical methods		• Software testing, • Knowledge engineering, • Image processing and analysis, • Graph theory, • Modern programming technologies, • Quantum computers, • Enterprise information systems, • Randomized algorithms, • Number theory, • Parallel algorithms, • Data processing systems, • Game theory, • Specification languages**,** • Applied cryptography**,** • Master's course paper in computer science, • Bioinformatics**,** • Selected Topics about Data Warehouses, • Deep Learning**,** • Big data technologies, • Computer security and vulnerabilities, • Quantum algorithms, • Wireless sensor networks, • Digital design, • Data mining algorithms, • Mathematical Foundations of Cryptography, • Program correctness, • Open Government Data in a data-driven world, • Combinatorics, • Mathematics for computer science I, • Mathematics for computer science II, • Selected topics in mathematical statistics for computer science	
Design and Implementation Graduates of a Second Cycle degree should be able to: • describe and explain design processes and methodologies relevant to their subject area and be able to apply and	☒ yes ☐ no	• Design and analysis of efficient algorithms, • Web programming, • Computer networks I, • System design, • Computer networks II, • Software testing, • Knowledge engineering, • Image processing and analysis,	☒

adapt them in unfamiliar situations • specify and complete informatics tasks that are complex, incompletely defined or unfamiliar • apply state-of-the-art or innovative methods in problem solving, possibly involving the use of other disciplines • demonstrate that they can think creatively to develop new and original designs, approaches, methods, etc.		• Graph theory, • Modern programming technologies, • Quantum computers, • Enterprise information systems, • Randomized algorithms, • Number theory, • Parallel algorithms, • Data processing systems, • Game theory, • E-commerce and ICT Infrastructure, • Selected Topics of Visual Communication Design, • UNIX operating system, • Software quality, • Specification languages, • Applied cryptography, • Master's course paper in computer science, • Bioinformatics, • Selected Topics about Data Warehouses, • Deep Learning, • Big data technologies, • IT project management, • Computer security and vulnerabilities, • Practical combinatorial optimization, • Blockchain for Business, • Quantum algorithms, • Virtual Environments, • Wireless sensor networks, • Digital design, • Data mining algorithms, • Mathematical Foundations of Cryptography, • Program correctness, • Open Government Data in a data-driven world, • Visual Perception: Methodologies, Frameworks, • Language, Spatial Cognition and Communication, • Combinatorics, • Mathematics for computer science I, • Mathematics for computer science II,	

		• Selected topics in mathematical statistics for computer science	
Economic, legal, social, ethical and environmental context Graduates of a Second Cycle degree should be able to: • demonstrate awareness of the need for a high level of professional and ethical conduct in informatics • identify relevant legal, commercial, industrial, economic and/or social contexts appropriate to their area of study and explain their relevance • evaluate risk and information security issues relevant to their area of study	☒ yes ☐ no	• Design and analysis of efficient algorithms, • Computer networks I, • System design, • Computer networks II, • Software testing, • Enterprise information systems, • Data processing systems, • Game theory, • E-commerce and ICT Infrastructure, • UNIX operating system**,** • Software quality, • Applied cryptography**,** • Selected Topics about Data Warehouses, • IT project management, • Computer security and vulnerabilities, • Blockchain for Business, • Virtual Environments**,** • Wireless sensor networks, • Visual Perception: Methodologies, Frameworks	☒
Informatics practice Graduates of a Second Cycle degree should be able to: • describe and explain applicable techniques and methods for their particular area of study and identify their limitations • apply informatics techniques to new application areas, taking account of relevant commercial, industrial, social and environmental constraints • contribute to the further development of informatics	☒ yes ☐ no	• Design and analysis of efficient algorithms, • Web programming, • Computer networks I, • System design, • Computer networks II, • Software testing, • Knowledge engineering, • Image processing and analysis, • Graph theory, • Quantum computers, • Enterprise information systems, • Randomized algorithms, • Data processing systems, • Game theory, • E-commerce and ICT Infrastructure, • Software quality, • Specification languages**,** • Applied cryptography**,**	☒

		• Bioinformatics**,** • Selected Topics about Data Warehouses, • Deep Learning, • Big data technologies, • IT project management, • Computer security and vulnerabilities, • Practical combinatorial optimization**,** • Blockchain for Business, • Virtual Environments**,** • Digital design, • Open Government Data in a data-driven world, • Combinatorics	
Other Professional Skills and Competences Graduates of a Second Cycle degree should be able to: • organise their own work independently, demonstrating initiative and exercising personal responsibility • appreciate the skills required to work with and lead a team that may be composed of people from different disciplines and different levels of qualification • undertake literature searches and reviews using databases and other sources of in-formation • communicate effectively both verbally and using a variety of communications media to a variety of different audiences and preferably also in a second language • plan self-learning and improve personal performance as a foundation for lifelong	☒ yes ☐ no	• Design and analysis of efficient algorithms, • Web programming, • Computer networks I, • Computer networks II, • Knowledge engineering, • Modern programming technologies, • Enterprise information systems, • E-commerce and ICT Infrastructure, • Selected Topics of Visual Communication Design, • Software quality, • Applied cryptography**,** • Master's course paper in computer science, • Bioinformatics**,** • Selected Topics about Data Warehouses, • Deep Learning**,** • IT project management, • Computer security and vulnerabilities, • Blockchain for Business, • Virtual Environments**,** • Wireless sensor networks, • Data mining algorithms, • Program correctness, • Open Government Data in a data-driven world, • Visual Perception: Methodologies, Frameworks,	☒

learning and ongoing professional development		• Language, Spatial Cognition and Communication	

The **provided final theses** demonstrate that the students achieve the intended learning outcomes and are able to work independently on a task at the required level (EQF-level 7).

About the General Criteria of the Euro-Inf Framework Standards

Based on the analysis carried out in the national reference accreditation report and their own review of the documents and the audit discussion rounds, the experts consider the general criteria for the award of the Euro-Inf label fulfilled.

Further evaluation

In addition to analysing whether the overall learning outcomes of the two degree programmes meet the respective Euro-Inf criteria, the experts also discussed further points such as the structure and further development of the curricula, the module descriptions, student satisfaction, and quality management. This discussion and the resulting evaluation with regard to positive points and room for improvement are presented below.

The Bachelor 's and Master's degree programmes in Computer Science at the University of Latvia exhibit several strengths that enhance the student experience and contribute to graduates' success in the job market which is why the experts have an overall positive impression of the two degree programmes. During the discussion rounds, students express a high level of satisfaction with their studies, and feedback from employers indicates that graduates are well-prepared for the job market. One of the standout features of the programs is the internship component, which students find valuable as it provides hands-on experience and facilitates career readiness. Additionally, both programmes are highly flexible, offering numerous specialization options that allow students to tailor their studies to meet specific interests and career aspirations. This flexibility is complemented by a strong collaborative relationship with industry partners, ensuring that the curriculum aligns with market demands and offering students practical opportunities to network with potential employers. The programmes also emphasize a practical approach to learning, which students appreciate for its relevance to real-world applications. In addition, the teachers are appreciated by the students for their qualifications and commitment, which contributes to a supportive and high-quality learning environment. Furthermore, the students report positive experiences with regard to international mobility. They confirm that the University of Latvia provides good opportunities within the Erasmus+ programme and also a helpful advisory system, so that students feel well supported.

Despite these positive aspects, there is still room for improvement to further enhance the student experience and the quality of the programmes.

Firstly, after reviewing the module descriptions, the experts note that some courses appear to overlap in content, particularly in the Bachelor's degree programme. In line with this, students report, for instance, that they had two courses covering basics of *Python* and that they had four courses on *numeric bases* in the first study year. This is consistent with the impressions that the experts received after reviewing the module descriptions. They have the feeling that, at least according to the module descriptions, some courses are somewhat

similar in terms of their title and the objectives and content described. Furthermore, there are also some courses in the Master's programme that are very similar in title to courses from the Bachelor's programme. However, the students state that the content in the Master's programme in general and especially in these courses does differ and is taught at an appropriate, higher level. Another point concerning the curricular structure described by the students is that, for example, in the Linux programming course, prior knowledge of data structures was expected, but according to the curriculum, this is first taught in the same year of study, so that it was not fully ensured that all the necessary prior knowledge was available. In the experts' opinion, these instances suggest a need for better coordination among faculty to ensure that course content is sequenced logically and redundancies are minimized. Although there is a clearly defined university-wide procedure for the development of curricula and the approval of courses, it appears to the experts that not all teaching staff involved in the programmes discuss the individual content of their courses with each other, which can lead to duplication. However, it should be noted at this point that the students state that the examples listed are rather exceptional cases and that, overall, both are well-coordinated programmes. In addition, some students also state that they appreciate it when content is covered in several courses, as this allows them to get to know several perspectives. The students also indicate that the lecturers are always open to repeating topics in the lectures if necessary and, on the other hand, to dealing with them more quickly if sufficient knowledge is already available. In summary, the experts come to the conclusion that, in principle, these are well-established programmes that enable and support the achievement of the intended learning objectives. However, the experts recommend revising the module descriptions of both programmes, particularly with regard to the titles, content and learning objectives, in order to check whether the individual courses are sufficiently differentiated from each other across the degree programmes and also to check where possible redundancies and duplications occur in the curriculum, especially regarding the Bachelor's degree programme. In this context, the experts would also like to recommend closer cooperation between teaching staff when compiling and further developing the curricula in order to avoid duplication of content in the future and to be able to offer even more coherent study programmes.

What is more, the experts recognize room for improvement in the organisation respectively preparation of the final theses. During the discussion, students indicate that currently, there is an extensive 20-page document outlining formatting requirements for the theses. The students find this rather complicated and wish that the university could simply provide appropriate templates (e.g. for LaTeX). One student mentions the existence of an unofficial template but questions why it is not officially published. Additionally, some students

pointed out that the existing formatting regulations appear outdated, which can create unnecessary challenges and confusion during the thesis preparation phase. The experts can understand the students' argument and recommend providing a corresponding format template to simplify the preparation of the thesis.

Furthermore, during the discussion round, students express concerns over inconsistencies and some lack of transparency in the grading process of exams and the graduation theses. They claim that grading outcomes of the theses often vary significantly depending on the committee involved, and that more detailed feedback on what aspects were evaluated as strengths or weaknesses would help them understand the basis of their grade. Furthermore, students mention that for courses with grades calculated from multiple assignments or exams, they often do not receive updates on their performance in these assessments until the final grade is issued. This lack of interim feedback leaves them uncertain about their standing throughout the course, limiting their ability to address any areas of improvement prior to the final assessment. The experts also understand this point and recommend that the university inform students more transparently about assessment and grading. This applies on the one hand to semester-long, multi-part examinations, where students should also be informed about the results of interim examinations, and on the other hand to final theses. For these in particular, there should be a standardised and transparent assessment, which should subsequently be made available to students in an uncomplicated manner.

In addition, the experts note in the audit discussions that some credit assignments for modules should be re-evaluated. During the discussion, students describe minor discrepancies in the workload in relation to the allocated credit points. For example, students state that some courses with two credits have a similar workload to those with four credits, which indicates a possible need for recalibration. Therefore, the experts recommend re-evaluating the credit assignment of individual courses.

Furthermore, the experts gain the impressions that the onboarding process for Master's degree students, particularly those who completed their Bachelor's degrees elsewhere, could also be enhanced. During the discussion round, students mention challenges in navigating the learning management system (Moodle) and selecting appropriate courses. The many (in principle positive) options for (elective) courses and specialisations and the minor issues regarding the module descriptions described above also have an influence on this, as these can make it confusing for new students to get started. According to the expert

group, a more structured advisory system, specifically designed for external Bachelor graduates entering the Master's degree programme, would ease this transition and provide clearer guidance on course selection and programme requirements. Therefore, the experts recommend introducing an onboarding process for Master's students to support them in the initial organisation of their studies.

Finally, students report that they feel that their input on course evaluations is not always taken seriously. As this assessment within this report is mainly a technical and content-related one, this point is only touched as a side note. The underlying national accreditation already ensures that the university has an established, structured and functioning quality management system. However, the experts would like to include the students' statements in order to point out to the university that there may be a need for improvement with regard to course evaluations. For example, the experts want to remind the university to make sure that students feel heard and to convey the feeling that their input has an influence on the further development of individual courses and the degree programmes as a whole. This is the only way to ensure that enough students take part in the evaluations and that the results can then be used for further development.

D Summary: Recommendations of the expert panel

Based on the reference accreditation report and the findings listed above, the experts summarise their analysis and final assessment for the award of the Euro-Inf label as follows:

Degree Programme	Euro-Inf Label	Maximum period of accreditation
Ba Computer Science	Without requirements	30.09.2030
Ma Computer Science	Without requirements	30.09.2030

Recommendations

For all degree programmes

E 1. It is recommended to review the module descriptions regarding contents, titles and objectives.

E 2. It is recommended to improve the cooperation of the teaching staff regarding the composition and development of the curricula.

E 3. It is recommended to review the assigned amount of credits to each module.

E 4. It is recommended to provide format templates for the graduation theses.

E 5. It is recommended improve transparency with regard to grading, especially for final theses.

For the bachelor's degree programme Computer Science

E 6. It is recommend to review the curriculum regarding content overlaps and redundancies.

For the master's degree programme Computer Science

E 7. It is recommend to implement an onboarding process, especially for external Bachelor graduates.

E Decision of the Accreditation Committee

Assessment and analysis for the award of the Euro-Inf® Label:

The AC discusses the procedure and follows the experts' assessment without any changes.

The Accreditation Committee decides to award the Euro-Inf label as follows:

Degree Programme	Euro-Inf Label	Maximum period of accreditation
Ba Computer Science	Without requirements	30.09.2030
Ma Computer Science	Without requirements	30.09.2030

Recommendations

For all degree programmes

E 1. It is recommended to review the module descriptions regarding contents, titles and objectives.

E 2. It is recommended to improve the cooperation of the teaching staff regarding the composition and development of the curricula.

E 3. It is recommended to review the assigned amount of credits to each module.

E 4. It is recommended to provide format templates for the graduation theses.

E 5. It is recommended improve transparency with regard to grading, especially for final theses.

For the bachelor's degree programme Computer Science

E 6. It is recommend to review the curriculum regarding content overlaps and redundancies.

For the master's degree programme Computer Science

E 7. It is recommend to implement an onboarding process, especially for external Bachelor graduates.

Appendix

Elaboration: decision made in addition to a prior accreditation in accordance with the European Standards and Guidelines

The decision at hand on the award of the Euro-Inf label is based on a reference report about a prior accreditation procedure in accordance with the European Standards and Guidelines. This reference report is:

> *Expert group joint opinion*
>
> *Evaluation Procedure: Assessment of Study Field*
>
> *Higher Education Institution: University of Latvia*
>
> *Study field: Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
>
> The report is publically available at the following link: https://eplatforma.aika.lv/index.php?r=site%2Fprogram%2Fview&id=1785

This decision follows the principle of building upon preceding quality assurance procedures. Therefore, no criterion is evaluated again which has already been assessed sufficiently in a prior accreditation procedure. Prerequisites for this are that

a) The degree programmes under review have a valid accreditation from a reference accreditation procedure in accordance with the European Standards and Guidelines (ESG)[3].

b) EQANIE's Accreditation Committee has generally agreed to the complimentary assessment of subject-specific standards in informatics and business informatics for the award of the Euro-Inf label.

[3] Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) in the current version.