REPUBLIC OF CROATIA

ALGEBRA UNIVERSITY
ZAGREB

DIPLOMA SUPPLEMENT

Kristijan Rosandić

born on 8 May 2002 in Slavonski Brod, Republic of Croatia

01822222272	0321019387	CLASS: 602-03/25-13/240
Personal Identification Number (OIB)	Student Identification Number (JMBAG)	REF. NO.: 785-04-01-25-02

INFORMATION IDENTIFYING THE QUALIFICATION

Acquired academic or professional title or titles, or academic degree	Bachelor in Applied Computer Engineering
Scientific area and scientific field	Technical sciences - Computing
Date of qualification acquisition	30.09.2024.
Name of study programme	Applied Computer Engineering , specialization in Software Engineering
Data on study programme accreditation	Licence for conducting the study programme issued by the Ministry of Science and Education on 27 July 2010, CLASS: UP/I-602-04/09-12/00006, REF. NO.: 533-07-10-0004.
Name and address of the higher education institution awarding the degree and conducting the study programme	Algebra University Gradišćanska 24 10000 Zagreb
Data on the accreditation of the higher education institution	Licence for performing higher education activities and conducting study programmes issued by the Ministry of Science and Education on 18 July 2023, CLASS: UP/I-602-04/19-12/00001, REF. NO: 533-04-23-0013.
Language or languages of instruction/examination	Croatian
Access requirement(s) and level of the Croatian Qualifications Framework required for access	A professional undergraduate study programme can be enrolled in by a person who has completed a corresponding secondary school programme in the duration of at least four years and passed the state matriculation examination or a person who has completed a corresponding professional short-cycle study programme. Level 4.2 or 5 according to the Croatian Qualifications Framework.
Level of acquired qualification (type of study programme, level of study programme, university/professional study programme)	Professional undergraduate study programme
Level of the Croatian Qualifications Framework	6 st.
EQF level	6
Official length of the study programme in years or semesters	Official length in years: 3
Total number of ECTS points acquired	180
Data on the mode of study, student status during studies (full-time/part-time status, recognition of prior learning, etc.).	Full-time status

LIST OF PASSED COURSES

Name of the course	Grade	ECTS credits
English for IT	very good (4)	4
Computer architecture	very good (4)	5
Kinesiological culture 1	passed	0
Kinesiological culture 2	passed	0
Mathematical analysis	very good (4)	5
Mathematics	very good (4)	5
Operating systems	excellent (5)	5
Basics of digital electronics	very good (4)	6
Basics of business economics	good (3)	4
Programming	excellent (5)	6
Business software tools	excellent (5)	4
Data structures and algorithms	excellent (5)	6
Introduction to databases	very good (4)	5
Introduction to computer networks	good (3)	5
Authentication systems and databases	very good (4)	4
Object-oriented programming	excellent (5)	6
Object-oriented programming - lab in .NET environment	excellent (5)	5
Database development	very good (4)	5
Basics of business communication	very good (4)	5
Java programming 1	excellent (5)	6
Project management	good (3)	4
Project approach to applications development	excellent (5)	4
Development of web applications	excellent (5)	6
Information system security 1	very good (4)	5
Standards in internet technology application	excellent (5)	5
Probability and statistics	good (3)	5
Interoperability of information systems	excellent (5)	5
Application development for mobile devices	excellent (5)	6
Java web programming	very good (4)	5
Designing and developing a complete application solution	excellent (5)	6
Organization and management	very good (4)	4
Information systems in business administration	very good (4)	4
Accessing data from program code	excellent (5)	5
Software engineering	good (3)	5
Decision-making support systems	excellent (5)	6
Management of information systems	very good (4)	4
Final thesis/Internship	passed	10

Average grade	**4,29**	**Weighted grade point average during studies and level of success**	**4,34**

<table>
<tr>
<td>Grading system/description of grade distribution</td>
<td>Algebra University uses a point accumulation model (maximum 100 points per course) for grading, which is combined with an absolute criterion-referenced grade distribution model. In order to pass the module, the student must collect at least 50% of the possible number of points for each of the learning outcomes within the module.
Grading is performed according to learning outcomes, using different assessment methods (exam, homework, project), whereby at least 75% of the points are awarded through objective-type assessment performed in a controlled environment.
The scoring structure of a typical module looks as follows:

<table>
<tr><th></th><th>Exam</th><th>Homework</th><th>Seminar paper</th><th>TOTAL</th></tr>
<tr><td>LO1</td><td>10</td><td></td><td>5</td><td>15</td></tr>
<tr><td>LO2</td><td>20</td><td></td><td>5</td><td>25</td></tr>
<tr><td>LO3</td><td>10</td><td>4</td><td></td><td>14</td></tr>
<tr><td>LO4</td><td>25</td><td>6</td><td></td><td>31</td></tr>
<tr><td>LO5</td><td>10</td><td>5</td><td></td><td>15</td></tr>
<tr><td>TOTAL</td><td>75</td><td>15</td><td>10</td><td>100</td></tr>
</table>

Grades are calculated according to the following criterion-referenced table:
<table>
<tr><td>0,00 - 50,00</td><td>fail (1)</td></tr>
<tr><td>50,01 - 58,00</td><td>pass (2)</td></tr>
<tr><td>58,01 - 75,00</td><td>good (3)</td></tr>
<tr><td>75,01 - 92,00</td><td>very good (4)</td></tr>
<tr><td>92,01 - 100,00</td><td>excellent (5)</td></tr>
</table>
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</tr>
<tr>
<td>Information on the method of completing the study programme and obtaining a diploma</td>
<td>In order to acquire the qualification, the student has to pass all the prescribed modules, complete an internship and prepare a final thesis and successfully defend it in the final exam.</td>
</tr>
<tr>
<td>Information on the final or graduation thesis, final or graduation exam, performance of a work of art or defense of a scientific or art dissertation</td>
<td>The final thesis was written on the topic: Development of a software solution with advanced interface for storage, organization, and management of files and folders in the cloud and defended: 30.09.2024. with the grade: excellent (5)</td>
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</table>

LEARNING OUTCOMES OF THE STUDY PROGRAMME

The student obtained the following competencies through their studies:

1. Actively, in speech and writing, communicate in English on the topics in the field of computer science and applied computing.
2. Evaluate and analyse problems in the field of expertise using concepts of information theory, applied mathematical theory and best engineering practices.
3. Suggest solutions in the field of applied computing by analysing and evaluating current knowledge, models and solutions in the field of the expertise.
4. Apply complex research and analysis methods to determine detailed user or organizational requirements for information solutions or systems.
5. Identify, analyse and explain the problems of applying, polishing and implementing existing information systems in a wider business context and propose adequate solutions.
6. Manage relationship with users and / or members of a team, recognizing possible sources of misunderstanding and conflict and proactively and effectively influence their inhibition.
7. Design, prepare and manage the implementation of development projects in the field of applied computing using recognized methodologies and considering available resources, budgets and risks.
8. Be aware of business, organizational and sociological aspects of application and impact on the environment (user, organization, society) when planning, designing and applying information systems.
9. Evaluate the entrepreneurial idea and propose adequate business and organizational conditions for its realization.
10. Proactively manage your own professional and personal development and collect new knowledge and skills in different contexts and environment (e.g. through successful and unsuccessful projects, through continuous self-learning and monitoring of scientific and technological achievements, additional education ...).
11. Independently design and manage IT project with available resources, taking responsibility for personal and team tasks in unpredictable business conditions and environment.
12. Perform an independently significant final project by following set of requirements and standards and by applying modern technologies, tools and methodology.
13. Apply basic software tools, structures and algorithms to solve problems and develop complete software solutions.
14. Apply tools and techniques for creating and formatting databases, and entering, modifying and accessing data in databases.
15. Expert usage of current programming languages (Java, C #, ...) and development tools, and apply current software development methodologies using object-oriented approach.
16. Use modern tools, techniques and development frameworks to create software solutions for the web environment.
17. Use modern tools, techniques and development frameworks to create mobile software solutions.
18. Create, plan and design user interface in accordance with current trends in design, ergonomics and accessibility, including interfaces for users with special needs.
19. Design and build complex interactive application solutions and applications for business usage
20. Create software solutions in line with current methodologies of solution development lifecycle, project development of applications, software engineering and software documentation.
21. Apply adequate methods and techniques for tackling large sets of data and create

solutions to support management and decision-making.

ADDITIONAL INFORMATION

Access to further levels of education	The student has the right to continue their studies in a professional graduate study programme or a university graduate study programme in accordance with the internal regulations of the higher education institution that conducts that study programme and along with passing differential exams determined by the higher education institution.
Access to regulated professions	-
Professional status (if any) and access to the labour market	Upon completion of the study programme, the holder of this qualification is authorised to use the professional title: Prvostupnik (baccalaureus) inženjer računarstva / Prvostupnica (baccalaurea) inženjerka računarstva (bacc. ing. comp.). Description of the title awarded: Bachelor in Applied Computer Engineering
Sources of additional information	Algebra University Gradišćanska 24 HR-10000 Zagreb Republic of Croatia Phone: + 385 1 2222 182 Fax: + 385 1 2222 183 E-mail: student@algebra.hr Web: http://www.algebra.hr ENIC/NARIC National Information Centre Donje Svetice 38/5 HR-10000 Zagreb, Republic of Croatia Phone: +385 1 627 48 88 Fax: +385 1 627 48 89 E-mail: enic@azvo.hr Web: http://www.azvo.hr
Internship carried out in:	Company: Hrvatska akademska i istraživačka mreža - CARNET Relevant work experience recognized instead of work placement.
Academic mobility:	-
Prizes:	-
Disciplinary measures:	-
During their studies, the student obtained industrial certificates as follows:	-
Other:	-

DISPLAY OF THE LEVEL OF ACHIEVEMENT OF LEARNING OUTCOMES IN THE MODULE

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-500	English for IT	1	Mandatory	15 hours	30 hours	4	4	15.02.2022	Max. 100%
Outcome 1	Use technical terminology from the professional literature in given exercises.								70%
Outcome 2	Use simple grammatical structures in given exercises.								93%
Outcome 3	Write a simple text in English in form of a business letter.								90%
Outcome 4	Hold a simple presentation in English by using professional language.								80%
Outcome 5	Integrate technical terminology into new contexts in English in given exercises.								90%
Outcome 6	Use more complex grammatical structures in English in given exercises.								95%
Outcome 7	Write a simple summary of a professional text in English.								95%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-501	Kinesiological culture 1	1	Mandatory	0 hours	30 hours	0	Pass.	13.09.2023	Max. 100%
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Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-502-1	Mathematics	1	Mandatory	30 hours	30 hours	5	4	11.02.2022	Max. 100%
Outcome 1	Analyse the elementary functions, sketch graphs of elementary functions, and calculate the domain of basic and complex functions.								95%
Outcome 2	Calculate inverse functions, basic operations on sets and display sets, and operations Venn diagrams, and calculate the arithmetic and geometric series.								88%
Outcome 3	Solve basic operations with matrices, calculate determinant of matrix, and solve systems of linear equations using appropriate methods.								79%
Outcome 4	Calculate basic geometry objects in plane and space (lines and planes) using vectors and use basic linear algebra in manipulation with geometry objects.								56%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-500	Basics of digital electronics	1	Mandatory	30 hours	30 hours	6	4	01.02.2022	Max. 100%
Outcome 1	Use number systems and codes to display digital data.								63%
Outcome 2	Use methods to detect and correct data transmission errors.								75%
Outcome 3	Apply axioms and theorems of Boolean algebra.								58%
Outcome 4	Minimize and implement complex logic functions using basic logic circuits.								83%
Outcome 5	Design a simple combinational digital circuit.								92%
Outcome 6	Design a simple arithmetic digital circuit.								92%
Outcome 7	Design a simple sequential digital circuit.								82%
Outcome 8	Analyze the characteristics of static and dynamic memories.								59%
Outcome 9	Analyze the operation of circuits for digital-to-analog and analog-to-digital conversion.								90%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-503	Programming	1	Mandatory	30 hours	45 hours	6	5	05.02.2022	Max. 100%
Outcome 1	Design a simple algorithm according to the guidelines and implement it using the basic elements of a programming language.								100%
Outcome 2	Select a suitable container for storing more data and apply complex mathematical and logical operations to its elements.								100%
Outcome 3	Design a solution to a simple problem using functions, create and call them.								89%
Outcome 4	Design a simple user data type and use its instances to solve a problem.								97%
Outcome 5	Create a solution using the available memory options of stack and heap.								100%
Outcome 6	Construct a solution using files.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-504	Business software tools	1	Mandatory	15 hours	30 hours	4	5	18.02.2022	Max. 100%
Outcome 1	Use the programme to work with e-mail for communication and organization.								70%
Outcome 2	Use basic tools and possibilities of the program for creating presentations.								79%
Outcome 3	Use basic tools and features of a word processing programme in order to design and manage documents.								93%
Outcome 4	Use basic tools, functions, formulas, and possibilities of the spreadsheet programme to design and calculate data and manage workbooks.								96%

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-501	Introduction to computer networks	1	Mandatory	30 hours	30 hours	5	3	17.02.2022	Max. 100%
Outcome 1	Define the role of computer network and network technologies.								73%
Outcome 2	Analyze computer communication using software tools for network traffic analysis.								53%
Outcome 3	Configure devices in a network topology with multiple subnets.								70%
Outcome 4	Define the architecture and role of wireless communication networks.								58%
Outcome 5	Define the role of cybersecurity in IT systems.								50%

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-502	Computer architecture	2	Mandatory	30 hours	30 hours	5	4	05.07.2022	Max. 100%
Outcome 1	Differentiate between the structure and the elements of a motherboard in a personal computer and sketch the architecture, modules, and circuits of a processor.								100%
Outcome 2	Analyze the phases of performing instructions and the state of the bus and combine basic, branching, and looping instructions in assembler assignments.								82%
Outcome 3	Sketch and analyze the structure and the basic elements of the ALU and the control unit.								76%
Outcome 4	Analyze the concept and organization of the interrupt system and methods of data transfer.								94%
Outcome 5	Analyze the parallelism on a processor, multicore processors, and systems with multiple processors.								94%
Outcome 6	Compare SMP and NUMA memory models on systems with multiple processors.								88%

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-505	Kinesiological culture 2	2	Mandatory	0 hours	30 hours	0	Pass.	13.09.2023	Max. 100%

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Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-503	Mathematical analysis	2	Mandatory	30 hours	30 hours	5	4	07.07.2022	Max. 100%
Outcome 1	Define the rules of elementary derivation and apply them on function composition derivations and implicitly and parameter-defined functions.								76%
Outcome 2	Apply differential calculus when determining characteristic parameters for drawing a function graph.								87%
Outcome 3	Define basic features of an indefinite integral and use the substitution method to solve tasks.								75%
Outcome 4	Define definite integral and use Newton-Leibnitz formula for calculating surfaces under the curves.								80%

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-504-1	Operating systems	2	Mandatory	30 hours	30 hours	5	5	11.07.2022	Max. 100%
Outcome 1	Explain how the interrupt system works on a simple computers model.								99%
Outcome 2	Explain the concept of process on a computer.								83%
Outcome 3	Explain the concept of threads on a computer and how the processor allocates time to them.								94%
Outcome 4	Explain simple principles of memory management.								88%
Outcome 5	Explain the simple principles of disk management.								88%
Outcome 6	Explain the principles of operation of simple multimedia operating systems.								82%

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-505	Basics of business economics	2	Mandatory	30 hours	15 hours	4	3	23.07.2022	Max. 100%
Outcome 1	Present the basic elements of the economic system.								65%
Outcome 2	Explain market, supply, demand, and the concept of elasticity of supply and demand.								63%
Outcome 3	Analyze the factors influencing consumer behavior and producer decisions.								65%
Outcome 4	Explain the characteristics of production inputs.								63%
Outcome 5	Explain the interaction of macroeconomic objectives, instruments, and indicators.								64%
Outcome 6	Explain the impact of various factors on economic growth and development.								54%

Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-00-506	Data structures and algorithms	2	Mandatory	30 hours	30 hours	6	5	22.07.2022	Max. 100%
Outcome 1	Determine and argue the time complexity a priori and a posteriori for a given algorithm derived in a programming language.								100%
Outcome 2	Construct a solution using linear data structures (list, linked list, stack, queue) and associated algorithms.								100%
Outcome 3	Construct a solution using hierarchical data structures (tree, heap, priority queue) and associated algorithms.								100%
Outcome 4	Construct a solution using tree-based dictionaries and associated algorithms.								100%

Outcome 5	Describe sorting and search algorithms and construct a solution based on sorting and search algorithms.								92%
Outcome 6	Create a solution using addressing techniques and argue their time complexity.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
21-06-506	Introduction to databases	2	Mandatory	30 hours	30 hours	5	4	09.07.2022	Max. 100%
Outcome 1	Construct a relational data model starting from user requirements.								96%
Outcome 2	Create a database using DDL statements based on a relational model.								100%
Outcome 3	Propose changes to the relational model to achieve a higher normal form.								100%
Outcome 4	Use basic statements to manage data in a relational database.								100%
Outcome 5	Construct a solution using system and aggregate functions and grouping.								68%
Outcome 6	Apply subqueries to create a more complex query.								77%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-507	Authentication systems and databases	3	Mandatory	15 hours	30 hours	4	4	25.01.2023	Max. 100%
Outcome 1	Support LDAP, AAA, and IDM systems.								100%
Outcome 2	Evaluate Microsoft LDAP strategy.								100%
Outcome 3	Justify the use of OpenLDAP, SAML, OAuth, and similar authentication systems.								96%
Outcome 4	Support installation and configuration of SQL instance.								75%
Outcome 5	Argue the implementation of a new database and database backup, automated data export tasks.								60%
Outcome 6	Recommend monitoring tools for SQL server performance.								67%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-510	Object-oriented programming	3	Mandatory	30 hours	45 hours	6	5	06.02.2023	Max. 100%
Outcome 1	Design a solution to a given problem according to a basic specification and implement it using classes and objects.								100%
Outcome 2	Apply the principle of inheritance in a programming language.								100%
Outcome 3	Identify the need for a polymorphic solution to the problem and implement it.								93%
Outcome 4	Anticipate the possibility of exceptions and process them.								100%
Outcome 5	Implement and apply generic structures in a programming language.								100%
Outcome 6	Implement part of the software solution using the "Publisher-Subscriber" pattern.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-512	Database development	3	Mandatory	30 hours	30 hours	5	4	04.02.2023	Max. 100%
Outcome 1	Use basic statements to create and use views and triggers in a relational database.								100%
Outcome 2	Use basic statements to create and use procedures and functions and solve slow query problems using an index in a relational database.								80%
Outcome 3	Use basic statements to create CRUD operations in a relational database.								89%
Outcome 4	Use JSON and XML methods and user-defined table data types in a relational database.								71%
Outcome 5	Use transactions and isolation levels in a relational database.								100%
Outcome 6	Use advanced grouping functions and window or analytical functions in a relational database.								100%
Outcome 7	Compare different non-relational data models and basic statements for data management in non-relational databases.								83%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-509-1	Basics of business communication	3	Mandatory	30 hours	30 hours	5	4	31.01.2023	Max. 100%
Outcome 1	Recommend ways and patterns of planning, writing, and concluding business messages, create basic patterns of routine, positive and negative messages, and explain their content, form, and effectiveness.								95%
Outcome 2	Recommend ways and patterns of planning, writing, and completing persuasive messages, reports, and proposals, explain their specifics and forms, and present, evaluate, and explain the importance and effectiveness of visual communications.								83%
Outcome 3	Recommend basic ways of collecting, analyzing, and using business information, suggest basic forms of negotiation, distinguish ways of successful and unsuccessful team communication, suggest ways of overcoming conflicts and conducting meetings, recognize cultural differences, and prepare for business.								81%
Outcome 4	Recommend a way of crisis communication immediately after the crisis, create models of presentations, suggest a way to prepare for a job interview, and write a successful resume.								77%
Outcome 5	Create a simple presentation, analyze the audience, and present the content.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-511	Standards in internet technology application	3	Mandatory	30 hours	30 hours	5	5	27.01.2023	Max. 100%
Outcome 1	Create a page structure according to a detailed specification.								100%
Outcome 2	Stylize page display.								100%

Outcome 3	Structure page display using client scripting.								100%
Outcome 4	Apply standard client scripting libraries to manage page structure.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-508	Probability and statistics	3	Mandatory	30 hours	30 hours	5	3	10.02.2023	Max. 100%
Outcome 1	Adopt the basic combinatorial notions and rules and calculate the probability in the classical probability space.								83%
Outcome 2	Determine the conditional probability of an event.								67%
Outcome 3	Determine basic numerical characteristics of a given discrete random variable and evaluate numerical characteristics of some continuous random variables, especially the normal and exponential random variables.								66%
Outcome 4	Calculate the basic quantities for given discrete statistical data.								92%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-518	Object-oriented programming - lab in .NET environment	4	Mandatory	15 hours	45 hours	5	5	11.09.2023	Max. 100%
Outcome 1	Construct a desktop solution using standard components.								100%
Outcome 2	Recommend ways of improving and implementing user experience in desktop applications.								100%
Outcome 3	Recommend ways of constructing and implementing the parent-child relationship in desktop applications.								100%
Outcome 4	Implement an appropriate desktop application architecture.								100%
Outcome 5	Apply animations for achieving better user experience in desktop applications.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-515	Java programming 1	4	Mandatory	30 hours	45 hours	6	5	07.09.2023	Max. 100%
Outcome 1	Implement the basic concepts of object-oriented paradigm in object-oriented programming language on a virtual platform.								100%
Outcome 2	Apply a functional paradigm and evaluate it in relation to an object-oriented paradigm.								100%
Outcome 3	Identify the need to use the collection framework and flows and implement them according to best practices.								100%
Outcome 4	Compare and evaluate the traditional and modern way of working with the data system.								100%
Outcome 5	Apply appropriate libraries to design standard graphics software solutions.								100%
Outcome 6	Apply appropriate libraries based on MVC architecture in designing standard graphical software solutions.								100%
Outcome 7	Compare different approaches when creating graphic software solutions.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-513	Project management	4	Mandatory	30 hours	15 hours	4	3	13.09.2023	Max. 100%
Outcome 1	Explain basic values of the methodology, project charter, and organizational structures. Develop the project's WBS structure, milestones, and activities.								50%
Outcome 2	Calculate project plan and know how to control project by using Critical path method. Explain basic parameters of Earned Value Method.								79%
Outcome 3	Explain basic concepts of managing issues, scope, communication, risks, quality, and metrics within different PM standards and methodologies.								75%
Outcome 4	Create a project timetable with project activities and resources by using tools for project management.								50%
Outcome 5	Update project plan and create a report on the progress and cost of the project by using tools for project management.								50%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-516	Project approach to applications development	4	Mandatory	30 hours	15 hours	4	5	13.06.2023	Max. 100%
Outcome 1	Independently create a functionality specification document based on collected and ranked user requests.								100%
Outcome 2	Design the application according to the given architecture.								100%
Outcome 3	Design programming tasks based on user requirements and recommend their distribution by project iterations.								100%
Outcome 4	Use the basic functionalities of the selected versioning system in the project team.								100%
Outcome 5	Independently apply different types of functionality and application characteristics testing.								88%
Outcome 6	Independently create a basic user manual document for a given application.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-517	Development of web applications	4	Mandatory	30 hours	30 hours	6	5	24.06.2023	Max. 100%
Outcome 1	Create a solution using HTTP protocol and RESTful server application.								100%
Outcome 2	Compare methods and implement state storage in a web application.								100%
Outcome 3	Implement MVC architecture in web application development.								90%

Outcome 4	Implement the model in an MVC web application.								100%
Outcome 5	Recommend the use of AJAX technology in creating views in the MVC web application.								95%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
22-00-514	Information system security 1	4	Mandatory	30 hours	30 hours	5	4	29.06.2023	Max. 100%
Outcome 1	Explain the basic concepts, methods, and techniques of information security.								58%
Outcome 2	Suggest an optimal way to approach the organization of information system protection.								79%
Outcome 3	Describe the ways in which the security of an information system may be compromised.								87%
Outcome 4	Determine methods for vulnerability management processes, Web application security, and methods for managing log records.								76%
Outcome 5	Understand the category of malicious programs and techniques for their use, network security controls, advanced persistent threat, and business continuity.								84%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-523	Application development for mobile devices	5	Elective	30 hours	30 hours	6	5	27.06.2024	Max. 100%
Outcome 1	Evaluate the architecture of the mobile ecosystem.								100%
Outcome 2	Implement a mobile application using advanced graphical interface elements.								100%
Outcome 3	Evaluate standard architectural components of mobile applications and apply them when implementing user requirements.								100%
Outcome 4	Implement the data layer of the mobile application.								100%
Outcome 5	Analyze and use different types of mobile ecosystem services in order to meet user requirements.								100%
Outcome 6	Implement different levels of security within the mobile environment.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-519	Organization and management	5	Mandatory	30 hours	15 hours	4	4	10.02.2024	Max. 100%
Outcome 1	To define management, its functions, activities and manager roles and to enumerate management skills.								100%
Outcome 2	Interpret the elements of the external and internal environment od the organization.								83%
Outcome 3	Explain the relationship and connection of different planning elements.								100%
Outcome 4	Critically evaluate the decision-making stages and various models and decision-making techniques.								68%
Outcome 5	Analyze the advantages and disadvantages of different organizational structures.								83%
Outcome 6	Argue the importance of human resource management in the enterprise.								68%
Outcome 7	Evaluate the advantages and disadvantages of different leadership models and motivation theories.								92%
Outcome 8	Explain the importance of the organization's controlling process.								88%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-522	Accessing data from program code	5	Mandatory	30 hours	30 hours	5	5	03.02.2024	Max. 100%
Outcome 1	Create a software solution using a relational database on the cloud as a data source.								100%
Outcome 2	Create a software solution using solutions for storing unstructured data in the cloud as a data source.								100%
Outcome 3	Create a software solution using a non-relational cloud database as a data source.								100%
Outcome 4	Select the optimal conceptual data model and implement it.								100%
Outcome 5	Implement a software solution using selected ORM tools.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-521	Software engineering	5	Mandatory	30 hours	30 hours	5	3	15.02.2024	Max. 100%
Outcome 1	Recommend and argue an appropriate method of software development or team organization with regard to the specifics of the project.								60%
Outcome 2	Recommend the use of appropriate agile methods and practices.								50%
Outcome 3	Categorize the offered characteristics with regard to roles, ceremonies or artefacts in the selected agile process framework.								82%
Outcome 4	Develop a way to monitor the design based on the characteristics of the organization or working group.								50%
Outcome 5	Calculate an estimate of the scope of a software release in agile planning and evaluation.								54%
Outcome 6	Organize software system requirements and develop software system specification.								64%
Outcome 7	Create an appropriate UML diagram in a specific aspect of the software process.								82%
Outcome 8	Identify the area of application of certain good practices in code writing (e.g. software craftsmanship, agile architecture, and agile testing).								77%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-525	Decision-making support systems	5	Elective	30 hours	30 hours	6	5	30.01.2024	Max. 100%
Outcome 1	Classify decision support system elements.								100%
Outcome 2	Attribute relevance analysis calculation.								100%
Outcome 3	Evaluate usage of specific quantitative method within decision support system.								94%
Outcome 4	Select adequate quantitative method for solving problems in domain of decision support systems.								56%

Outcome 5	Analyze data and create a holistic solution.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-520	Management of information systems	5	Mandatory	30 hours	15 hours	4	4	01.02.2024	Max. 100%
Outcome 1	Describe basic terms and concepts of information systems management.								80%
Outcome 2	Explain the purpose and application of information systems management.								76%
Outcome 3	Describe standards applicable to information systems management.								80%
Outcome 4	Define the stages in managing information services.								68%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-529	Interoperability of information systems	6	Mandatory	30 hours	30 hours	5	5	28.06.2024	Max. 100%
Outcome 1	Assess the justification for introducing interoperability in public and private organizations in terms of e-business, legal framework, strategy, and interoperability framework.								100%
Outcome 2	Compare the performances of mark-up languages in the interoperability of information systems and argue the opinion about it.								100%
Outcome 3	Select and justify the use of technology used in services in more complex cases of distributed system integration.								100%
Outcome 4	Recommend the use of security aspects in web services when it is most appropriate to achieve interoperability of information systems.								100%
Outcome 5	Select the option of introducing new services in the SOA or microservice architecture or reusing of existing services.								84%
Outcome 6	Recommend the standards of communication, information exchange, and storage formats important for interoperability.								100%
Outcome 7	Determine which security mechanisms should be used on existing interoperable services to ensure optimal protection.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-531	Java web programming	6	Elective	30 hours	30 hours	5	4	26.06.2024	Max. 100%
Outcome 1	Create a simple web application using language of the virtual platform using the given language specification.								80%
Outcome 2	Structure views in a web application using object-oriented language libraries on a virtual platform.								86%
Outcome 3	Apply appropriate libraries when creating web applications to join views and background code.								100%
Outcome 4	Define application security aspects using deployment descriptor.								100%
Outcome 5	Implement filters for request processing.								70%
Outcome 6	Apply event handlers when creating web applications.								70%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-528	Designing and developing a complete application solution	6	Mandatory	15 hours	45 hours	6	5	20.06.2024	Max. 100%
Outcome 1	Plan a complete solution to a simpler problem in applied computing.								100%
Outcome 2	Implement a complete solution to a simpler problem in applied computing.								96%
Outcome 3	Recommend appropriate ways to prevent the misuse of personal data in the software product.								100%
Outcome 4	Develop project documentation using classical or agile development methodology applying relevant standards and approaches.								100%
Outcome 5	Explain to users and other stakeholders the details of architecture, design, and finished software product.								100%
Outcome 6	Present the finished software product to the stakeholders, participate in the product discussion and self-critically evaluate own contribution.								100%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	Level of adoption of learning outcomes
23-00-526	Information systems in business administration	6	Mandatory	30 hours	15 hours	4	4	18.06.2024	Max. 100%
Outcome 1	Define basic terms and concepts of business information systems.								80%
Outcome 2	Define business information systems in the context of support for management and decision making.								88%
Outcome 3	Define business information systems in the context of support for business functions.								68%
Outcome 4	Define strategic management of business information systems.								68%
Code	Name	Semester	E/M	Lecture	Ex.	ECTS	Grade	Date	
23-00-527	The final thesis	6	Mandatory	0	0	10	5	30.09.2024	
Topic of final thesis was "Development of a software solution with advanced interface for storage, organization, and management of files and folders in the cloud" with mentor Daniel Bele.									

Rector

Zagreb, 30 September 2024 locus sigilli Assoc. Prof. Mislav Balković, PhD

INFORMATION ON THE HIGHER EDUCATION SYSTEM IN THE REPUBLIC OF CROATIA

TYPES OF HIGHER EDUCATION INSTITUTIONS

Higher education institutions are universities, faculties, art academies and polytechnics (universities of applied sciences).

Universities (sveučilišta) are higher education institutions which offer university study programmes in at least two scientific fields/fields of arts and in at least three scientific areas/areas of arts. Universities may also offer professional study programmes. Universities may establish faculties (fakulteti) and art academies (umjetničke akademije) as constituent units which are legal entities. Universities may establish university departments, faculties or art academies which are not legal entities, research institutes, centres, institutes, clinics or other organisational units as constituent units which are not legal entities. Universities and their constituent unts perform higher education activities, scientific or artistic activities as well as professional activities.

Polytechnics/Universities of applied sciences (veleučilišta) are higher education institutions which offer professional study programmes. They perform higher education activities and professional activities and may perform scientific or artistic activities.

Public universities are established by law, public polytechnics are established by a decree of the Government of the Republic of Croatia, and private higher education institution are established by a decision of the founder.

TYPES OF STUDY PROGRAMMES

Higher education institutions perform university or professional study programmes.

University study programmes prepare students for work in science, arts and higher education, in the private and public sectors and society in general, as well as for the development and application of scientific, artistic and professional achievements.

Professional study programmes prepare students for professional work in the private and public sectors and society in general.

Levels of studies are: short-cycle study programmes, undergraduate study programmes, graduate study programmes and postgraduate or doctoral study programmes.

The Republic of Croatia joined the Bologna Process in 2001, and since 2005 learning outcomes and student workload expressed in ECTS credits have been defined within study programmes. Students can normally obtain 60 ECTS credits within one year.

Short-cycle study programmes

Short-cycle study programmes (stručni kratki studiji) take two years in which students earn 120 ECTS credits.

The requirement for enrolling in a short-cycle study programme is to complete a corresponding secondary school programme according to the requirements determined by the higher education institution.

Upon completion of the study programme, students receive a certificate as well as a certificate supplement and the professional title of pristupnik with an indication of the field of study.

Undergraduate study programmes

University undergraduate (sveučilišni prijediplomski studiji) or professional undergraduate study programmes (stručni prijediplomski studiji) are performed in the first cycle of higher education and take three years in which students earn at least 180 ECTS credits, or take four years in which students earn at least 240 ECTS credits.

They can be enrolled in by a person who has completed a corresponding secondary school programme in the duration of at least four years and passed the state matura examination. A professional undergraduate study programme can be enrolled in by a person who has completed a short-cycle study programme. Exceptionally, undergraduate study programmes in the field of arts can be enrolled in without a completed corresponding secondary school education on the basis of the recognition of prior non-formal and informal learning. More detailed enrolment requirements for specific study programmes are determined by the higher education institution.

Upon completion of the study programme, students receive a diploma and a diploma supplement.

Students graduating in university undergraduate study programmes are awarded the academic title of University Bachelor/baccalaureus (sveučilišni prvostupnik/prvostupnica) with an indication of the field of study (univ. bacc.). Students graduating in professional undergraduate study programmes are awarded the professional title of Bachelor/ baccalaureus (prvostupnik/prvostupnica) with an indication of the field of study (bacc.).

Graduate study programmes

University (sveučilišni diplomski studiji) and professional graduate study programmes (stručni diplomski studiji) are performed in the second cycle of higher education. They normally take two years in which students earn at least 120 ECTS credits. The requirement for enrolment is a completed three-year undergraduate study programme with at least 180 ECTS credits obtained.
One-year graduate study programmes in which students earn at least 60 ECTS credits can also be performed. They can be enrolled in by students who have completed four-year university or professional undergraduate study programmes and earned 240 ECTS credits.
Normally, students who complete a university undergraduate study programme can enrol in a university graduate study programme, and students who complete a professional undergraduate study programme can enrol in a professional graduate study programme. However, it is possible that students who complete a professional undergraduate study programme enrol in a university graduate study programme if they pass differential exams.
More detailed enrolment requirements for specific study programmes are determined by the higher education institution.
Upon completion of the study programme, students receive a diploma and a diploma supplement.
By completing a university graduate study programme, students are awarded the academic title of University Master (sveučilišni magistar) with an indication of the field of study (univ. mag. with an indication of the field of study). In the field of technical sciences and some programmes in the field of biotechnical sciences, students are awarded the academic title of University Master of Engineering (sveučilišni magistar inženjer) with an indication of the field of study (univ. mag. ing. with an indication of the field of study).
By completing a professional graduate study programme, students are awarded the professional title of Master (magistar) with an indication of the field of study (mag. with an indication of the field of study), and in the technical field students are awarded the title of Master of Engineering (magistar inženjer) with an indication of the field of study (mag. ing. with an indication of the field of study).

Integrated university undergraduate and graduate study programmes

Integrated university undergraduate and graduate study programmes (sveučilišni integrirani prijediplomski i diplomski studiji) encompass the first and the second cycle of higher education and take five years in which students earn at least 300 ECTS credits, or six years in which students earn at least 360 ECTS credits.
They can be enrolled in by a person who has completed a corresponding secondary school programme in the duration of at least four years and passed the state matura examination. Exceptionally, integrated university undergraduate and graduate study programmes in the field of arts can be enrolled in without a completed corresponding secondary school education on the basis of the recognition of prior non-formal and informal learning. More detailed enrolment requirements for specific study programmes are determined by the higher education institution.
Upon completion of the study programme, students receive a diploma and a diploma supplement.
By completing an integrated university undergraduate and graduate study programme, students are awarded the academic title of University Master (sveučilišni magistar) with an indication of the field of study (univ. mag. with an indication of the field of study), and in the field of medicine, veterinary medicine and dental medicine students are awarded the academic title of Doctor (doktor) with an indication of the field of study (dr. with an indication of the field of study).

Specialist university study programmes

Specialist university study programmes (sveučilišni specijalistički studiji) are performed in the third cycle of higher education and take one to two years in which students earn from 60 to 120 ECTS credits.
Specialist university study programmes can be enrolled in by a person who has completed a corresponding university graduate or university integrated undergraduate and graduate study programme, and exceptionally by a person who has completed a professional graduate study programme if they pass differential exams. More detailed enrolment requirements for specific study programmes are determined by the higher education institution.
Upon completion of the study programme, students receive a diploma and a diploma supplement.
By completing a specialist university study programme, students are awarded the academic title of Specialist (specijalist) with an indication of the field of study (spec. with an indication of the field of study), and in the field of medicine, veterinary medicine, dental medicine, pharmacy and medical biochemistry, students are awarded the academic title of University Specialist (sveučilišni specijalist) with an indication of the field of study (univ. spec. with an indication of the field of study).

Doctoral study programmes

Doctoral study programmes (doktorski studiji) are performed in the third cycle of higher education and take three years in which students earn 180 ECTS credits.
They can be enrolled in by a person who has completed a corresponding university graduate study

programme, an integrated university undergraduate and graduate study programme or a specialist university study programme.
Upon completion of the study programme, students receive a diploma and a diploma supplement.
By completing a doctoral study programme, students are awarded the academic degree of Doctor of Science (doktor znanosti) with an indication of the scientific field (dr. sc. with and indication of the scientific field) or Doctor of Fine Arts (doktor umjetnosti) (dr. art.).

ACCREDITATION OF HIGHER EDUCATION INSTITUTIONS AND STUDY PROGRAMMES

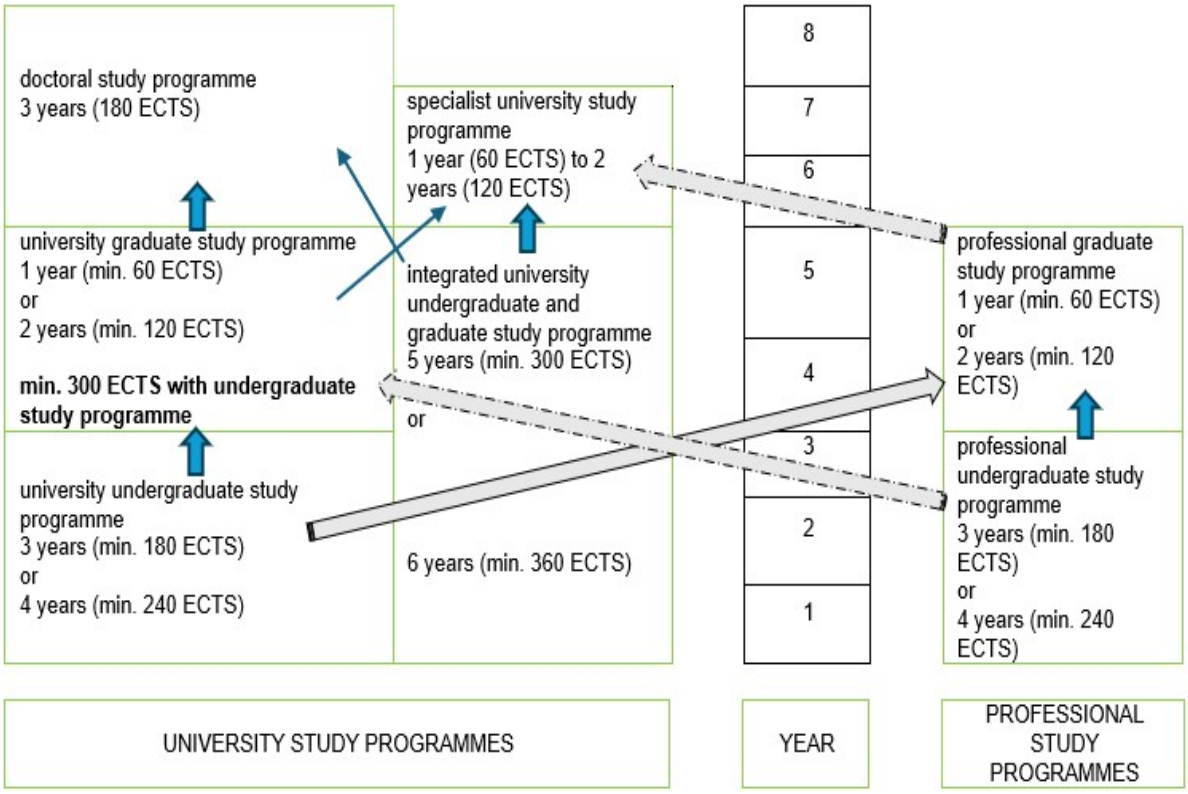
The Agency for Science and Higher Education is a national body responsible for different types of external evaluation of the quality in higher education and science in alignment with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). The Agency was founded by the Republic of Croatia, is periodically evaluated by the European Association for Quality Assurance in Higher Education (ENQA) and is registered with the European Quality Assurance Register for Higher Education (EQAR).
All higher education institutions in the Republic of Croatia are subject to the initial accreditation procedure in order to obtain a licence for operating.
For all new study programmes, an initial accreditation is conducted by the Agency for Science and Higher Education according to the uniform criteria for all public and private higher education institutions and for all university and professional study programmes.
The Agency for Science and Higher Education also conducts the procedure of a regular re-accreditation of higher education institutions in the Republic of Croatia, as well as thematic evaluations.

GRADING SYSTEM

The learning outcomes obtained in a study programme are evaluated by the following grades:
Izvrstan (excellent) (5) - excellent achievement corresponding to the letter grade A
Vrlo dobar (very good) (4) - above-average achievement corresponding to the letter grade B
Dobar (good) (3) - average achievement corresponding to the letter grade C
Dovoljan (pass) (2) - satisfactory achievement corresponding to the letter grade D
Nedovoljan (fail) (1) - learning outcomes have not been achieved, and the grade corresponds to the letter grade F.
Particular courses can be evaluated descriptively, in which case they are not included in the calculation of the grade point average of the study programme.

NATIONAL QUALIFICATIONS FRAMEWORK

The Croatian Qualifications Framework (CROQF) is an instrument for regulating the entire system of qualifications at all education levels in the Republic of Croatia, referencing the levels of qualifications obtained in the Republic of Croatia to the levels of the European Qualifications Framework (EQF) and the Qualifications Frameworks in the European Higher Education Area (QF-EHEA).
More information on the Croatian Qualifications Framework can be accessed via: http:/www.kvalifikacije.hr.


doctoral study programme
3 years (180 ECTS)
specialist university study programme
1 year (60 ECTS) to 2 years (120 ECTS)
university graduate study programme
1 year (min. 60 ECTS)
or
2 years (min. 120 ECTS)
min. 300 ECTS with undergraduate study programme
integrated university undergraduate and graduate study programme
5 years (min. 300 ECTS)
or
university undergraduate study programme
3 years (min. 180 ECTS)
or
4 years (min. 240 ECTS)
6 years (min. 360 ECTS)
professional graduate study programme
1 year (min. 60 ECTS)
or
2 years (min. 120 ECTS)
professional undergraduate study programme
3 years (min. 180 ECTS)
or
4 years (min. 240 ECTS)
8
7
6
5
4
3
2
1
UNIVERSITY STUDY PROGRAMMES
YEAR
PROFESSIONAL STUDY PROGRAMMES