

University *of Ljubljana*
Faculty *of Computer and Information Science*



**FIRST CYCLE UNIVERSITY STUDY PROGRAMME
COMPUTER AND INFORMATION SCIENCE**

HANDBOOK

for students enrolled for the first time in the first year in the 2024/2025 academic year

Ljubljana, 2024

INFORMATION ABOUT THE STUDY PROGRAMME COMPUTER AND INFORMATION SCIENCE

Main objectives of the programme

Computer and information science is one of the leading breakthrough fields that have been shaping today's economy, education, culture, administration and other areas for several decades now. The striking growth of computer technology dictates the need for highly qualified staff capable of developing, managing and maintaining user and systems technology and the IT systems based on those technologies. This academic study programme appeals to and motivates young professionals, especially those who feel drawn to computer and information science. The programme is comparable with international standards and recommendations, and keeps up with the rapid development of computer science and the latest knowledge. The study programme accordingly provides future engineers with a sufficient professional basis to be able later on, after completing undergraduate studies, to keep abreast of technological changes and successfully continue their career both in Slovenia and on an international level. The study programme allows students to tailor courses according to their desires, preferences and motivation, in keeping with the various possibilities offered by professional specialisations. The initial core courses are followed by elective modules that offer specialisations in various technical fields.

General competences

- developing skills in critical, analytical and synthetic thinking,
- the ability to define, understand and creatively solve technical challenges in computer and information science,
- the ability to transfer knowledge, and professional communication and writing skills,
- the ability to search sources and critically analyse information,
- professional, environmental and social responsibility,
- the ability to apply acquired knowledge in independent work for solving technical and scientific problems in computer and information science,
- the ability to acquire new and enhance acquired technical knowledge,
- skills for group work in the profession, including with experts in other technical fields,
- developing professional responsibility and ethics,
- basic theoretical knowledge acquired in the fields of computer science and information technology and in the natural sciences and mathematics, which provides an excellent basis for continuing studies at the next level, both in computer science and in other technical fields.

Subject-specific competences

- basic skills in computer and information science, which include basic theoretical skills and skills essential for the fields of computer and information science (mathematical treatment of problems, theoretical basis of computer science),
- the ability to understand and apply computer and information science knowledge to other technical and professionally relevant fields (economics, organisational science, etc.),
- practical knowledge and skills in the development of software, hardware and information technologies, which are a necessary part of a successful professional's work in computer and information science (programming, computer architecture, networks),
- the ability to independently perform complex developmental engineering and organisational tasks in own specialised fields, and independently tackle specific, well-defined tasks in computer and information science areas.

Admission requirements

Enrolment in the academic programme is open to students who:

- a) have passed the general school-leaving examination (matura),

b) have completed a vocational matura exam in any secondary school programme and an exam in one of the matura subjects: computer science, mathematics or physics; the chosen subject must not be the same as the subject the candidate passes for the vocational Matura exam,

c) have completed any four-year secondary school study programme before 1 June 1995.

Selection criteria for limited enrolment

If a decision is taken to limit enrolment,

- candidates referred to in points 29 a) and c) will be selected depending on:

- overall pass in the general matura or school-leaving exam, 60% of points,
- overall grades in the third and fourth years, 35% of points,
- grades in mathematics in years 3 and 4 of secondary school, 5% of points;

- candidates from point 29 b) will be selected depending on:

- overall grades in the vocational matura, 20% of points,
- overall grades in the third and fourth years, 35% of points,
- grades in mathematics in years 3 and 4 of secondary school, 5% of points
- grade in one matura exam subject, 40% of points.

Criteria for recognising knowledge and skills acquired prior to enrolment

The study programme enables the recognition of relevant knowledge in the field acquired through formal, non-formal or experiential learning. The basis for recognition is the [Rules on the procedure and criteria for recognising non-formally acquired knowledge and skills](#). This type of knowledge can be recognised as part of the completed study requirements, at up to 6 ECTS for one set (the approximate study programme covered in one course) of knowledge acquired outside the Faculty. In the recognition process certificates and other documents are taken into account. Requests for recognition of acquired knowledge will be considered by FRI's Committee for Study Affairs.

Assessment methods

The methods of assessment comply with the [UL Statutes](#) and are set out in the curriculums.

Requirements for progression through the course

Requirements for progressing to a higher year

Students who have completed course units consisting of 53 credit points may enrol in the second year.

Students who have completed all the requirements of the first year and course units consisting of 53 credits in the second year may enrol in the third year.

Requirements for retaking a year

To retake a year, students must complete the following:

- a) at least half of the requirements from the study programme of that year (30 ECTS),
- b) all exams from the years before.

Students can only retake a year once in their course of study; changing programme is also considered retaking a year, because of the uncompleted requirements of the previous study programme.

Counselling and guidance during study

During the period of study the Career Centre at the Faculty of Computer and Information Science and tutors will be in direct contact with students, guiding their development, exercising concern for their academic success, motivating them towards personal advancement in the profession, and helping and advising them in resolving possible difficulties, problems and crises that can impede students during their course. If they encounter difficulties, students can also turn to the Career Centre of the University of Ljubljana.

Requirements for transferring between programmes

In accordance with the Criteria for Transferring between Programmes, transferring is possible from study programmes which upon completion guarantee similar competences and which enable the recognition of at least half of the obligations based on the European Credit Transfer System (ECTS) from the first study programme relating to compulsory subjects of the second study programme. Transferring from

other programmes is possible after the first year of study.

The requirements for transferring to the first-cycle academic study programme Computer and Information Science from other programmes (academic and professional) are:

- completed requirements for enrolment in the programme,
- at least an equivalent curriculum in Mathematics and Physics in the programme from which students transfer; the recognised courses must have at least as many credits as the aforementioned courses,
- the appropriate faculty authority defines, on the basis of a comparison of the two programmes, the requirements to be recognised and the year in which the candidate can enrol, and consequently issues a decision. Transferring is possible on the basis of the provisions applicable to such programmes.

The requirements for transferring to the academic programme Computer and Information Science from post-secondary programmes are:

- recognised ECTS credits the candidate obtained in the post-secondary programme; due to the variability and the different levels of difficulty in post-secondary programmes, the level of the candidate's knowledge is assessed by a special Admissions Committee, headed by the Vice Dean for Education, and it consequently approves the courses to be recognised for each individual student,
- the appropriate faculty authority defines, on the basis of a comparison of the two programmes, the requirements to be recognised and the year in which the candidate can enrol, and consequently issues a decision.

Requirements for completing the study programme

The requirements for completion of the programme are the passing of all exams and other requirements, including the diploma seminar, in a total of 180 ECTS.

Requirements for completing individual parts of the programme if the programme contains them

The study programme contains no parts that can be completed individually. The programme is integral.

Professional or academic title

- Bachelor of Science

Professional or academic title (abbreviated)

- B. Sc.

STUDY PROGRAMME CURRICULUM COMPUTER AND INFORMATION SCIENCE

2023/2024

Name of study programme	Computer and information science
Programme characteristics	
Type	academic
Cycle	bachelor
University of Ljubljana members	<ul style="list-style-type: none"> Faculty of Computer and Information Science, Večna pot 113, 1000 Ljubljana, Slovenija

Year 1

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0153574	Programming 1	Luka Fürst	45		30			105	180	6	1st semester	no
2.	0039582	Calculus	Žiga Virk	45		30			105	180	6	1st semester	no
3.	0039577	Discrete Structures	Gašper Fijavž	45		30			105	180	6	1st semester	no
4.	0039580	Introduction to Digital Circuits	Nikolaj Zimic	45		30			105	180	6	1st semester	no
5.	0039578	Physics	Borut Paul Kerševan	45		30			105	180	6	1st semester	no
6.	0039584	Programming 2	Boštjan Slivnik	45		30			105	180	6	2nd semester	no
7.	0039579	Linear Algebra	Polona Oblak	45		30			105	180	6	2nd semester	no
8.	0039576	Computer Systems Architecture	Branko Šter	45		30			105	180	6	2nd semester	no

9.	0039585	Computer Communications	Zoran Bosnić	45		30			105	180	6	2nd semester	no
10.	0039581	Introduction to Information Systems	Dejan Lavbič	45		30			105	180	6	2nd semester	no
Total				450	0	300	0	0	1050	1800	60		

Year 2

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039586	Algorithms and data structures 1	Tomaž Hočevar	45		30			105	180	6	1st semester	no
2.	0039591	Basics of Databases	Marko Bajec	45		30			105	180	6	1st semester	no
3.	0039593	Probability and Statistics	Aleksandar Jurišić	45	10	20			105	180	6	1st semester	no
4.	0039590	Computer Systems Organisation	Patricio Bulić	45		30			105	180	6	1st semester	no
5.	0039588	Computability and Computational Complexity	Borut Robič	45		30			105	180	6	1st semester	no
6.	0039592	Theory of Informations and Systems	Uroš Lotrič	45		30			105	180	6	2nd semester	no
7.	0039587	Algorithms and data structures 2	Borut Robič	45		30			105	180	6	2nd semester	no
8.	0039589	Operating Systems	Jurij Mihelič	45		30			105	180	6	2nd semester	no
9.	0069529	General elective course		45		30			105	180	6	2nd semester	yes
10.	0100845	Specialist elective course		45		30			105	180	6		yes

	Total	450	10	290	0	0	1050	1800	60	
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Year 2, Professional Elective Courses

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039605	Mathematical Modelling	Žiga Virk	45		30			105	180	6	2nd semester	yes
2.	0039606	Principles of Programming Languages	Andrej Bauer	45		30			105	180	6	2nd semester	yes
3.	0039607	Computer Technologies	Rok Žitko	45		30			105	180	6	2nd semester	yes
Total				135	0	90	0	0	315	540	18		

Year 2 and Year 3, General Elective Courses

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039594	English-level A	Nina Bishop Bostič	30		15			45	90	3	2nd semester	yes
2.	0039595	English-level B	Nina Bishop Bostič	30		15			45	90	3	1st semester	yes
3.	0039596	English-level C	Nina Bishop Bostič	30		15			45	90	3	2nd semester	yes

4.	0039597	Topics in Computer and Information Science		45		30			105	180	6	2nd semester	yes
5.	0039601	Computer Science in Practice I	Slavko Žitnik	5				40	45	90	3	1st semester, 2nd semester	yes
6.	0039602	Computer Science in Practice II	Slavko Žitnik	5				40	45	90	3	1st semester, 2nd semester	yes
7.	0039603	Computer Science Skills	Uroš Čibej	15		45			30	90	3	1st semester, 2nd semester	yes
8.	0568792	Economics and Entrepreneurship	Tomaž Hovelja	45	10	20			105	180	6	1st semester	yes
Total				205	10	140	0	80	465	900	30		

Year 3

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039610	Introduction to Artificial Intelligence	Zoran Bosnić	45		30			105	180	6	1st semester	no
2.	0100850	Module elective course 1/4		45		30			105	180	6	1st semester	yes
3.	0100851	Module elective course 2/4		45		30			105	180	6	1st semester	yes
4.	0100853	Module elective course 3/4		45		30			105	180	6	2nd semester	yes
5.	0100854	Module elective course 4/4		45		30			105	180	6	2nd semester	yes
6.	0069536	Software Engineering	Dejan Lavbič	45	10	20			105	180	6	2nd semester	no
7.	0100889	Professional elective courses (moduli + list)		45		30			105	180	6		yes

8.	0100890	Professional elective courses (list)		45		30			105	180	6		yes
9.	0100845	General elective course		45		30			105	180	6		yes
10.	0039608	Diploma seminar	Franc Solina	45	10	5			120	180	6	2nd semester	no
Total				450	20	265	0	0	1065	1800	60		

Year 3, Module Informatics

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039614	Electronic Business	Denis Trček	45		30			105	180	6	1st semester	yes
2.	0039622	Data Management Technologies	Matjaž Kukar	45	10	20			105	180	6	1st semester	yes
3.	0100860	Information Systems Development	Marko Bajec	45	20	10			105	180	6	2nd semester	yes
4.	0039620	Informatics Planning and Management	Rok Rupnik	45		30			105	180	6	2nd semester	yes
Total				180	30	90	0	0	420	720	24		

Year 3, Module Software

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039629	Software Development Processes	Branko Matjaž Jurič	45	10	20			105	180	6	1st semester	yes
2.	0039613	System Software	Tomaž Dobravec	45	10	20			105	180	6	1st semester	yes

3.	0100872	Analysis of Algorithms and Heuristic Problem Solving	Marko Robnik Šikonja	45	10	20			105	180	6	2nd semester	yes
4.	0039611	Compilers	Boštjan Slivnik	45		30			105	180	6	2nd semester	yes
Total				180	30	90	0	0	420	720	24		

Year 3, Module Computer Systems and Networks

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039625	Computer Networks Modeling	Miha Mraz	45	10	20			105	180	6	1st semester	yes
2.	0039627	Distributed Systems Computer	Uroš Lotrič	45		30			105	180	6	1st semester	yes
3.	0100867	Communication Protocols	Mojca Ciglarič	45		30			105	180	6	2nd semester	yes
4.	0039623	Mobile and Wireless Networks	Nikolaj Zimic	45	10	20			105	180	6	2nd semester	yes
Total				180	20	100	0	0	420	720	24		

Year 3, Module Artificial Intelligence

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039643	Intelligent Systems	Marko Robnik Šikonja	45	6	24			105	180	6	1st semester	yes
2.	0039645	Machine Perception	Matej Kristan	45	10	20			105	180	6	1st semester	yes

3.	0039644	Development of Intelligent Systems	Danijel Skočaj	45		30			105	180	6	2nd semester	yes
4.	0100896	Introduction to Data Mining	Blaž Zupan	45	20	10			105	180	6	2nd semester	yes
Total				180	36	84	0	0	420	720	24		

Year 3, Module Media Technologies

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039619	Computer Graphics and Game Technology	Matija Marolt	45	10	20			105	180	6	1st semester	yes
2.	0039617	Multimedia Systems	Luka Čehovin Zajc	45	10	20			105	180	6	1st semester	yes
3.	0039618	Introduction to Graphics Design	Narvika Bovcon	45		30			105	180	6	2nd semester	yes
4.	0069537	Platform Based Development	Veljko Pejović	45		30			105	180	6	2nd semester	yes
Total				180	20	100	0	0	420	720	24		

Year 3, Professional Elective Courses

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0039630	Web Programming	Dejan Lavbič	45	20	10			105	180	6	1st semester	yes

2.	0070351	Digital Design	Ratko Pilipović	45	10	20			105	180	6	1st semester	yes
3.	0171404	Organisation and Management	Tomaž Hovelja	45	10	20			105	180	6	2nd semester	yes
4.	0039628	Computer Systems Reliability and Performance	Miha Mraz	45	20	10			105	180	6	2nd semester	yes
Total				180	60	60	0	0	420	720	24		