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 2023/2024 academic year

Ljubljana, 2023

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

The following may enrol in the first-cycle Computer and Information Science academic study programme:

a) a candidate who has passed the general school-leaving examination (matura);

b) a candidate who has passed the vocational school-leaving examination in a programme of secondary professional or secondary technical education for the professions of electrical engineer, land surveying engineer, geotechnical engineer, construction engineer, chemical engineer, logistics engineer, media engineer, metallurgical engineer, environmental protection engineer, machine engineer, electronic communications engineer, mechatronics engineer or computer engineer, and the general school-leaving examination in: (computer science, mathematics or physics). The subject chosen may not be a subject that they have already taken for the vocational school-leaving examination;

c) a candidate who completed any four-year secondary school 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 (male)

- diplomirani inženir računalništva in informatike (UN)

Professional or academic title (female)

- diplomirana inženirka računalništva in informatike (UN)

Professional or academic title (abbreviated)

- dipl. inž. rač. in inf. (UN)

CURRICULUM OF THE STUDY PROGRAMME WITH EXPECTED SUBJECT LECTURERS

No specified direction (Study programme)

YEAR 1

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63277	Programming 1	Luka Fuerst	45		30			105	180	6	Fall	No
2.	63202	Calculus	Žiga Virk	45		30			105	180	6	Fall	No
3.	63203	Discrete Structures	Gašper Fijavž	45		30			105	180	6	Fall	No
4.	63204	Introduction to Digital Circuits	Nikolaj Zimic	45		30			105	180	6	Fall	No
5.	63205	Physics	Borut Paul Kerševan	45		30			105	180	6	Fall	No
6.	63278	Programming 2	Boštjan Slivnik	45		30			105	180	6	Spring	No
7.	63207	Linear Algebra	Polona Oblak	45		30			105	180	6	Spring	No
8.	63212	Computer Systems Architecture	Branko Šter	45		30			105	180	6	Spring	No
9.	63209	Computer Communications	Zoran Bosnić	45		30			105	180	6	Spring	No

10.	63215	Introduction to Information systems	Dejan Lavbič	45		30			105	180	6	Spring	No
		Total		450	0	300	0	0	1050	1800	60		

YEAR 2

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63279	Algorithms and Data Structures 1	Igor Kononenko	45		30			105	180	6	Fall	No
2.	63208	Basics of Databases	Marko Bajec	45		30			105	180	6	Fall	No
3.	63213	Probability and Statistics	Aleksandar Jurišić	45	10	20			105	180	6	Fall	No
4.	63218	Computer Systems Organisation	Patricio Bulić	45		30			105	180	6	Fall	No
5.	63283	Computability and Computational Complexity	Borut Robič	45		30			105	180	6	Fall	No
6.	63216	Theory of Information and Systems	Uroš Lotrič	45		30			105	180	6	Spring	No
7.	63280	Algorithms and Data Structures 2	Borut Robič	45		30			105	180	6	Spring	No
8.	63217	Operating Systems	Jurij Mihelič	45		30			105	180	6	Spring	No

9.	0001	Professional elective courses		45		30			105	180	6	Spring	Yes
10.	0002	General elective course		45		30			105	180	6		Yes
		Total		450	10	290	0	0	1050	1800	60		

Year 2, Professional Elective Courses

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63219	Mathematical Modelling	Žiga Virk	45		30			105	180	6	Spring	Yes
2.	63220	Principles of Programming Languages	Andrej Bauer	45		30			105	180	6	Spring	Yes
3.	63221	Computer Technologies	Rok Žitko	45		30			105	180	6	Spring	Yes
		Total		135	0	90	0	0	315	540	18		

Year 2 and Year 3, General Elective Courses

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63222	English Language – Level A	Nina Bishop Bostič	30		15			45	90	3	Spring	Yes
2.	63223	English Language – Level B	Nina Bishop Bostič	30		15			45	90	3	Fall	Yes

3.	63224	English Language – Level C	Nina Bishop Bostič	30		15			45	90	3	Spirng	Yes
4.	63225	Topics in Computer and Information Science		45		30			105	180	6	Spring	Yes
5.	63241	Computer Science in Practice I	Gašper Fijavž	5				40	45	90	3	Fall, Spring	Yes
6.	63242	Computer Science in Practice II	Gašper Fijavž	5				40	45	90	3	Fall, Spring	Yes
7.	63284	Computer Science Skills	Tomaž Dobravec, Zoran Bosnić	15		45			30	90	3	Fall, Spring	Yes
8.	63248	Economics and Entrepreneurships	Tomaž Hovelja	45	10	20			105	180	6	Spring	Yes
		Total		205	10	140	0	80	465	900	30		

YEAR 3

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63214	Introduction to Artificial Intelligence	Zoran Bosnić	45		30			105	180	6	Fall	No
2.	0003	Module elective course 1/4		45		30			105	180	6	Fall	Yes
3.	0004	Module elective course 2/4		45		30			105	180	6	Fall	Yes
4.	0003	Module elective course 3/4		45		30			105	180	6	Spring	Yes

5.	0004	Module elective course 4/4		45		30			105	180	6	Spring	Yes
6.	63256	Software Engineering	Dejan Lavbič	45	10	20			105	180	6	Spring	No
7.	0009	Professional elective courses (moduli + list)		45		30			105	180	6		Yes
8.	0010	Professional elective courses (list)		45		30			105	180	6		Yes
9.	0002	General elective course		45		30			105	180	6		Yes
10.	63281	Diploma seminar	Franc Solina	45	10	5			120	180	6	Spring	No
		Total		450	20	265	0	0	1065	1800	60		

Year 3, Module Informatics

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63249	Electronic Business	Denis Trček	45		30			105	180	6	Fall	Yes
2.	63226	Data Management Technologies	Matjaž Kukar	45	10	20			105	180	6	Fall	Yes
3.	63252	Information Systems Development	Marko Bajec	45	20	10			105	180	6	Spring	Yes

4.	63253	Informatics Planning and Management	Rok Rupnik	45		30			105	180	6	Spring	Yes
		Total		180	30	90	0	0	420	720	24		

Year 3, Module Software

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63254	Software Development Processes	Branko Matjaž Jurič	45	10	20			105	180	6	Fall	Yes
2.	63264	System Software	Tomaž Dobravec	45	10	20			105	180	6	Fall	Yes
3.	63263	Analysis of Algorithms and Heuristic Problem Solving	Marko Robnik Šikonja	45	10	20			105	180	6	Spring	Yes
4.	63265	Compilers	Boštjan Slivnik	45		30			105	180	6	Spring	Yes
		Total		180	30	90	0	0	420	720	24		

Year 3, Module Computer Systems and Networks

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**

1.	63257	Computer Networks Modelling	Miha Mraz	45	10	20			105	180	6	Fall	Yes
2.	63261	Distributed Systems	Uroš Lotrič	45	10	20			105	180	6	Fall	Yes
3.	63258	Communication Protocols	Mojca Ciglarič	45		30			105	180	6	Spring	Yes
4.	63259	Mobile and Wireless Networks	Nikolaj Zimic	45	10	20			105	180	6	Spring	Yes
		Total		180	30	90	0	0	420	720	24		

Year 3, Module Artificial Intelligence

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63266	Intelligent Systems	Marko Robnik Šikonja	45	6	24			105	180	6	Fall	Yes
2.	63267	Machine Perception	Matej Kristan	45	10	20			105	180	6	Fall	Yes
3.	63268	Development of Intelligent Systems	Danijel Skočaj	45		30			105	180	6	Spring	Yes
4.	63251	Introduction to Data Mining	Blaž Zupan	45	20	10			105	180	6	Spring	Yes
		Total		180	36	84	0	0	420	720	24		

Year 3, Module Media Technologies

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63269	Computer graphics and Game Technology	Matija Marolt	45	10	20			105	180	6	Fall	Yes
2.	63270	Multimedia Systems	Luka Čehovin Zajc	45	10	20			105	180	6	Fall	Yes
3.	63271	Introduction to Graphic Design	Narvika Bovcon	45		30			105	180	6	Spring	Yes
4.	63287	Platform-Based Development	Veljko Pejović	45		30			105	180	6	Spring	Yes
		Total		180	20	100	0	0	420	720	24		

Year 3, Professional Elective Courses

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63255	Web Programming	Dejan Lavbič	45	20	10			105	180	6	Fall	Yes
2.	63260	Digital Design	Patricio Bulić Nejc Ilc	45	10	20			105	180	6	Fall	Yes

3.	63250	Organisation and Management	Tomaž Hovelja	45	10	20			105	180	6	Spring	Yes
4.	63262	Computer Systems Reliability and Performance	Miha Mraz	45	20	10			105	180	6	Spring	Yes
		Total		180	60	60	0	0	420	720	24		