

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



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

**HANDBOOK**

for students enrolled for the first time in the first year in the 2020/2021 academic year

Ljubljana, 2020

# INFORMATION ABOUT THE STUDY PROGRAMME COMPUTER AND INFORMATION SCIENCE

## Main objectives of the programme

Computer and information science is one of the leading breakthrough areas that have been shaping today's economy, education, culture and other activities 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. The professional study programme is aimed principally at those with an interest in learning to solve practical problems in computer and information science. The programme is comparable to international standards and recommendations, taking into account the rapid development of computer science and new knowledge. In addition to providing a knowledge of all the fundamental subjects necessary for future engineers, the study programmes enable students to tailor their studies according to their own wishes, motivations and strengths, taking into account the various possibilities of professional specialisation. This is helped by the compulsory nine-week work assignment, which acquaints students with the needs of the commercial and public sectors and enables them once they become employed to be productively involved in the work of their selected company. The study programme accordingly provides future engineers with a sufficient professional basis, once they have completed this professional course of study, to be able to keep abreast of technical changes and continue their careers successfully at home as well as at an international level.

## General competences

Graduates will be able to resolve practical problems in the area of information technology. They acquire a complete set of competences that enables them to enter directly into a working environment:

- the capacity for critical, analytical and synthetic thinking,
- the capacity to understand and solve technical challenges,
- a knowledge of basic skills in computer science and information technology, including theoretical foundations and practical skills,
- the ability to independently perform less demanding and complex developmental engineering tasks in individual specialised fields and independently solve specific well-defined tasks in other areas of computer and information science,
- the ability to transfer specific computer skills to relevant fields,
- a qualification for group work and the ability to head small groups,
- the ability to become rapidly and productively involved in the working process at a future employer,
- a knowledge of sources of information and their application in professional work,
- the ability to communicate on a professional level in the native language and in one foreign language,
- a knowledge of professional responsibility and understanding of ethics at work,
- sufficient training in the fields of computer science and information technology to enable further study in second-cycle programmes.

## Subject-specific competences

- a knowledge of the operating principles of hardware and software, networks, programming languages and applications,
- a knowledge of programming constructs and databases and their effective application to solve problems in the real world,
- the ability to analyse a problem and create appropriate algorithm solutions,
- a knowledge of the appropriate programmer approaches and the capacity to distinguish between poorer and better solutions,

- a knowledge of the mathematical language for consistent and accurate description of phenomena and an understanding of the relationship between a theoretical model and its implementation in various fields of computer science,
- an understanding of the functioning of multifaceted systems of modern communication and their use,
- an awareness of security and insecurity in a network environment and the use of basic security mechanisms,
- a knowledge of the basic business functions and organisation of the selected company (practical assignment).

### Admission requirements

Enrolment in the professional study programme Computer and Information Science is open to students who:

- have completed the final examination in any four-year secondary school programme,
- have passed the vocational matura or general matura.

### Selection criteria for limited enrolment

In the event of a decision limiting enrolment, candidates will be selected depending on:

- the GPA in the final examination, vocational matura or matura examination, 60 points,
- the GPA of years 3 and 4 of secondary school, 40 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

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 professional 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 to Mathematics and Programming 1 in the study programme they are being transferred from (the recognised courses must have at least the same number of credits as the aforementioned subjects),
- 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.

#### 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 (VS)

#### Professional or academic title (female)

- diplomirana inženirka računalništva in informatike (VS)

#### Professional or academic title (abbreviated)

- dipl. inž. rač. in inf. (VS)

## CURRICULUM OF THE STUDY PROGRAMME WITH EXPECTED SUBJECT LECTURERS

No specified direction (Study programme)

### YEAR 1

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63701	Introduction to computer science	Danijel Skočaj	45		30			105	180	6	Fall	No
2.	63702	Programming 1	Janez Demšar	45		30			105	180	6	Fall	No
3.	63703	Computer Architecture	Robert Rozman	45		30			105	180	6	Fall	No
4.	63704	Mathematics	Polona Oblak	45		30			105	180	6	Fall	No
5.	63705	Discrete Structures	Gašper Fijavž	45		30			105	180	6	Fall	No
6.	63706	Programming 2	Tomaz Dobravec	45		30			105	180	6	Spring	No
7.	63707	Databases	Matjaz Kukar	45		30			105	180	6	Spring	No
8.	63708	Computer Communications	Mojca Ciglarič	45		30			105	180	6	Spring	No
9.	63709	Operating Systems	Peter Peer	45		30			105	180	6	Spring	No

10.	63710	Introduction to Probability and Statistics	Aleksandar Jurišić	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.	63711	Algorithms and Data Structures 1	Jurij Mihelič	45		30			105	180	6	Fall	No
2.	0005	Professional elective courses		180		120			420	720	24	Fall	Yes
3.	63723	Algorithms and Data Structures 2	Andrej Brodnik	45		30			105	180	6	Spring	No
4.	0006	Professional elective courses		135		90			315	540	18	Spring	Yes
5.	0002	General elective courses		45		30			105	180	6	Spring	Yes
Total				450	0	300	0	0	1050	1800	60		

**Year 2, Professional Elective Courses**

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63712	Electronic and Mobile Business	Rok Rupnik	45		30			105	180	6	Fall	Yes
2.	63713	Databases 2	Damjan Vavpotič	45		30			105	180	6	Fall	Yes
3.	63714	Information Systems	Damjan Vavpotič	45	10	20			105	180	6	Fall	Yes
4.	63715	Graphic Design	Iztok Lebar Bajec, Narvika Bovcon	45		30			105	180	6	Fall	Yes
5.	63716	Communications Protocols and Network Security	Andrej Brodnik	45		30			105	180	6	Fall	Yes
6.	63717	Computer Organisation	Robert Rozman	45	6	24			105	180	6	Fall	Yes
7.	63718	Digital Circuits	Mira Trebar	45	10	20			105	180	6	Fall	Yes
8.	63719	Computer Graphics	Iztok Lebar Bajec	45	15	15			105	180	6	Fall	Yes
9.	63720	Artificial Intelligence	Igor Kononenko	45	6	24			105	180	6	Fall	Yes
10.	63721	User Interfaces	Aleš Smrdel	45		30			105	180	6	Spring	Yes
11.	63722	Compilers and Virtual Machines	Boštjan Slivnik	45		30			105	180	6	Spring	Yes

12.	63724	Testing and Quality	Igor Rožanc	45		30			105	180	6	Spring	Yes
13.	63725	Information Systems Development	Damjan Vavpotič	45	10	20			105	180	6	Spring	Yes
14.	63726	Multimedia Content production	Borut Batagelj	45	10	20			105	180	6	Spring	Yes
15.	63744	Digital Signal Processing	Franc Jager	45		30			105	180	6	Fall	Yes
16.	63727	Web technologies	Aleš Smrdel	45	10	20			105	180	6	Spring	Yes
17.	63728	Input – Output Systems	Mira Trebar	45		30			105	180	6	Spring	Yes
18.	63729	Digital Logic Design	Miha Moškon	45		30			105	180	6	Spring	Yes
19.	63765	Data Mining	Tomaž Curk	45	10	20			105	180	6	Spring	Yes
20.	63769	Programming Language C	Tomaž Dobravec	15		45			30	90	3	Fall	Yes
21.	63767	Computer Science Skills	Tomaž Dobravec	15		45			30	90	3	Spring, Fall	Yes
22.	63766	Computer Science Skills 2	Tomaž Dobravec	15		45			30	90	3	Spring, Fall	Yes
23.	63749	Topics in Computer and information Science		45		30			105	180	6	Spring	Yes
Total				945	87	648	0	0	2190	3870	129		



**YEAR 3**

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	63732	Software Engineering	Igor Rožanc	45	20	10			105	180	6	Fall	No
2.	0005	Professional elective courses		180		120			420	720	24	Fall	Yes
3.	63743	Industrial Practice						225	315	540	18	Spring	No
4.	63770	Diploma seminar	Franc Solina	45	10	5			120	180	6	Spring	No
5.	0002	General elective course		45		30			105	180	6	Spring	Yes
		Total		315	30	165	0	225	1065	1800	60		

**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.	63768	IT Governance	Rok Rupnik	45		30			105	180	6	Fall	Yes
2.	63734	Multimedia Technologies	Alenka Kavčič	45	10	20			105	180	6	Fall	Yes

3.	63735	Parallel and Distributed Systems and Algorithms	Patricio Bulić	45	10	20			105	180	6	Fall	Yes
4.	63736	System Software	Branko Šter	45		30			105	180	6	Fall	Yes
5.	63737	Process Automation	Uroš Lotrič	45	10	20			105	180	6	Fall	Yes
6.	63738	Embedded Systems	Patricio Bulić	45	10	20			105	180	6	Fall	Yes
7.	63739	Robotics and Machine Perception	Danijel Skočaj	45		30			105	180	6	Fall	Yes
8.	63740	Game Technology and Virtual Reality	Peter Peer	45		30			105	180	6	Fall	Yes
9.	63741	Decision Systems	Aleksander Sadikov	45	10	20			105	180	6	Fall	Yes
10.	63742	Numerical Methods	Bojan Orel	45		30			105	180	6	Fall	Yes
Total				450	50	250	0	0	1050	1800	60		

**Year 2 and Year 3, General Elective Courses**

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63745	English – Level A	Nina Bishop Bostič	30		15			45	90	3	Spring	Yes
2.	63746	English – Level B	Nina Bishop Bostič	30		15			45	90	3	Fall	Yes
3.	63747	English – Level C	Nina Bishop Bostič	30		15			45	90	3	Spring	Yes
4.	63752	Computer Science in Practice I	Gašper Fijavž	5				40	45	90	3	Spring, Fall	Yes
5.	63753	Computer Science in Practice II	Gašper Fijavž	5				40	45	90	3	Spring, Fall	Yes
6.	63750	Physical Education	Iztok Mihevc			30			60	90	3	Fall	Yes
7.	63001	Use of IT for study	Veljko Pejović	30		15			45	90	3	Spring, Fall	Yes
		Total		130	0	90	0	80	330	630	21		

