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 2018/19 academic year

Ljubljana, 2018

CONTENTS

About the study programme

1. Study programme information

The first cycle professional study programme in computer and information science lasts 3 years (6 semesters) and comprises a total of 180 ECTS. Classes are conducted in Slovenian.

The professional title obtained is:

- diplomirani inženir računalništva in informatike (VS) ,
- diplomirana inženirka računalništva in informatike (VS)

abbreviated to "dipl. inž. rač. in inf. (VS)".

Area of study to which the programme belongs (ISCED): The basic field is "computer science (48)".

Scientific disciplines underlying the programme (according to the Frascati classification): The programme falls within the scope of "technology and natural sciences and mathematics".

Levels of SQF, EQF and EHEQF: Slovenian Qualifications Framework (SQF) 7; European Qualifications Framework (EQF) 6; European Higher Education Qualifications Framework (EHEQF) First cycle

2. Main objectives and general skills 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. The strident development of computer technology dictates the need for highly qualified personnel capable of developing new computer and information technology and implementing it in innovative environments. 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, taking into account the rapid development of computer science and new knowledge. In addition to providing fundamental knowledge of subjects necessary for future engineers, the study programmes enable students to tailor their studies according to their own wishes, motivations and strengths, always 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 skills

General skills acquired in the programme

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.

Specific skills acquired in the programme

- an understanding 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).

Information on the programme's international comparisons

We compared the Professional Study Programme in Computer and Information Science at the Faculty of Computer and Information Science to other related study programmes from the following universities/higher education institutions:

- Informatique, Université Pierre et Marie Curie, France
- Informatik, Fachhochschule Vorarlberg, Austria
- Informatik, Hochschule Darmstadt, Germany
- Ingegneria Informatica, Facolta' di Ingegneria, Universita di Pisa, Italy

3. Admission requirements and selection criteria for limited enrolment

To enrol in the Professional Computer and Information Science Study Programme candidates must have:

a) A completed final examination at any four-year secondary school;
b) A completed vocational matura examination; or
c) A completed matura examination.

In the event of a decision limiting enrolment, candidates will be selected according to:

- The GPA in the final examination, vocational matura examination or matura examination 60 %;
- The GPA of Years 3 and 4 of secondary school 40 %.

4. Criteria for recognizing knowledge and skills acquired prior to enrolment

The study programme enables the recognition of relevant knowledge acquired through formal and informal learning or experience. 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 university. In the recognition process certificates and other documents are taken into account. Requests for recognition of acquired knowledge will be considered by the Faculty's Committee for Student Affairs.

5. Requirements for progression through the programme

Requirements for progressing to a higher year
Students can enrol in Year 2 if they have obtained 53 ECTS.
Students can enrol in Year 3 if they have completed all credit points from Year 1 and 53 ECTS from Year 2.

Requirements for retaking a year
To retake a year, students must complete the following:

- At least half of the requirements from the study programme of the year in progress (30 ECTS);
- 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.

6. 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.

7. Transferring between study 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 Transfer Credit System (ECTS) from the first study programme that are related to obligatory courses of the second study programme. Transferring from other programmes is possible after the first year of study.

The requirements for transferring to the Professional Programme Computer and Information Science from other programmes (university and professional) are:

- Completed requirements for entry into the programme;
- 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 or more than the aforementioned subjects);

- The appropriate authority defines, on the basis of the 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.

8. Assessment methods

The assessment methods are defined in the study programmes for individual courses. The assessment methods for all courses are either in the form of written or oral examinations. Assessment includes: tests from exercises, defences of tests, oral examinations, seminars and projects, presentations of seminars and project work. The grading scale is in accordance with the Statutes of the University of Ljubljana. All assessments are graded on a scale from 5-10, where 6-10 are passing grades and 5 failing grade or or descriptively “passed with excellence”, “passed” or “failed”.

The general rules for assessment methods are regulated by the Faculty’s Study Regulations UL FRI.

9. Curriculum

Legend:
L = number of lectures
S = number of seminar exercises
T = number of theoretical and tutorial exercises
ECTS = number of ECTS points.

Each Semester lasts 15 weeks.

YEAR 1

No.	Study unit	Semester 1 L/S/T	Semester 2 L/S/T	ECTS
63701	Introduction to computer science	45/0/30		6

63702	Programming 1	45/0/30		6
63703	Computer Architecture	45/0/30		6
63704	Mathematics	45/0/30		6
63705	Discrete Structures	45/0/30		6
63706	Programming 2		45/0/30	6
63707	Databases		45/0/30	6
63708	Computer Communications		45/0/30	6
63709	Operating Systems		45/0/30	6
63710	Introduction to Probability and Statistics		45/0/30	6

YEAR 2

No.	Study unit	Semester 1 L/S/T	Semester 2 L/S/T	ECTS
63711	Algorithms and Data Structures 1	45/0/30		6
	Professional elective courses	45/0/30		6
	Professional elective courses	45/0/30		6
	Professional elective courses	45/0/30		6
	Professional elective courses	45/0/30		6
63723	Algorithms and Data Structures 2		45/0/30	6
	Professional elective courses		45/0/30	6
	Professional elective courses		45/0/30	6
	Professional elective courses		45/0/30	6
	General elective courses		45/0/30	6

YEAR 3

No.	Study unit	Semester 1 L/S/T	Semester 2 L/S/T	ECTS
63732	Software Engineering	45/20/10		6
	Professional elective courses	45/0/30		6
	Professional elective courses	45/0/30		6
	Professional elective courses	45/0/30		6
	Professional elective courses	45/0/30		6
	Industrial Practice			18
63770	Diploma seminar		45/10/5	6
	General elective course**			6

PROFESSIONAL ELECTIVE COURSES - YEAR 2

No.	Study unit	Semester 1 L/S/T	Semester 2 L/S/T	ECTS
63712	Electronic and Mobile Business	45/0/30		6
63713	Databases 2	45/0/30		6
63714	Information Systems	45/10/20		6
63715	Graphic Design	45/0/30		6
63716	Communications Protocols and Network Security	45/0/30		6

63717	Computer Organisation	45/6/24		6
63718	Digital Circuits	45/10/20		6
63719	Computer Graphics	45/15/15		6
63720	Artificial Intelligence	45/6/24		6
63721	User Interfaces		45/0/30	6
63722	Compilers and Virtual Machines		45/0/30	6
63724	Testing and Quality		45/0/30	6
63725	Information Systems Development		45/10/20	6
63726	Multimedia Content production		45/10/20	6
63744	Digital Signal Processing	45/0/30		6
63727	Web technologies		45/10/20	6
63728	Input – Output Systems		45/0/30	6
63729	Digital Logic Design		45/0/30	6
63765	Data Mining		45/10/20	6
63769	Programming Language C	15/0/45		3
63767	Computer Science Skills	15/0/45		3
63766	Computer Science Skills 2		15/0/45	3
63749	Topics in Computer and information Science	45/0/30		6

PROFESSIONAL ELECTIVE COURSES - YEAR 3

No.	Study unit	Semester 1 L/S/T	Semester 2 L/S/T	ECTS
63768	IT Governance	45/0/30		6
63734	Multimedia Technologies	45/10/20		6
63735	Parallel and Distributed Systems and Algorithms	45/10/20		6
63736	System Software	45/0/30		6
63737	Process Automation	45/10/20		6
63738	Embedded Systems	45/10/20		6
63739	Robotics and Machine Perception	45/0/30		6
63740	Game Technology and Virtual Reality	45/0/30		6
63741	Decision Systems	45/10/20		6
63742	Numerical Methods	45/0/30		6

GENERAL ELECTIVE PROGRAMMES

No.	Study unit	Semester 1 L/S/T	Semester 2 L/S/T	ECTS
63745	English – Level A		30/0/15	3
63746	English – Level B	30/0/15		3
63747	English – Level C		30/0/15	3
63752	Computer Science in Practice I	5/0/0		3
63753	Computer Science in Practice II		5/0/0	3
63750	Physical Education	0/0/30		3

10. Elective courses and mobility

Elective Courses

The study programme does not consist of traditional qualifications or modules, but has a system of prerequisites that are required to enrol in the majority of the elective courses, i.e. students must attend specific prerequisite courses to enrol in a specific elective course. In addition, students must choose at least two of the following courses:

- Compilers and Virtual Machines
- IT Governance
- Multimedia Technologies
- Web Technologies
- System Software
- Embedded Systems
- Digital Logic Design
- Robotics and Machine Perception
- Game Technology and Virtual Reality
- Decision Systems

Students must also choose all the prerequisite courses needed to enrol in the above courses.

These courses represent different areas of computer science (web, hardware, information systems, etc.) and "force" students to choose two separate sub-areas of computer science. By allowing the students to choose in Year 3 additional courses from Year 2 in fall semester, students can also learn the basics in other areas and thereby contribute to wider knowledge beyond the boundaries of their chosen specialisation.

Mobility and International Cooperation

Students can transfer 60 credits (for one study year, regardless of whether it is an obligatory course or an elective) from any computer and information science programme confirmed by the Faculty's Committee for Student Affairs. The Faculty of Computer and Information Science has signed Erasmus+ exchange programme contracts with numerous foreign universities.

11. Presentation of individual courses

Individual courses are presented on the faculty website.