University *of Ljubljana*

Faculty *of Computer and Information Science*

THIRD-CYCLE

COMPUTER AND INFORMATION SCIENCE STUDY PROGRAMME

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 (DOCTORAL STUDIES)

Main objectives of the programme

The fundamental objectives of the doctoral study programme in Computer and Information Science are:

- To educate highly trained experts, developers, researchers and future scientists for the field of computer and information science.
- To train doctoral students to perform independent research and development work, to use scientific approaches in their work and to master the latest development processes in the field of computer and information science.
- To develop the abilities of doctoral students to work in groups, develop communication abilities and the ability to report on scientific and research work, and to develop the abilities of doctoral students to work in interdisciplinary groups and circles.
- To enable doctoral students to gain an in-depth understanding of computer and information science.

Verification is conducted during the academic year as well as at the end of the year in subject-appropriate ways of verifying knowledge. In this way we verify the level of knowledge acquired and how this matches the objectives set out in the syllabuses for individual subjects. In accordance with the Statutes of the University of Ljubljana, exams are graded 1-10, where the passing grades are 6-10 inclusive. Depending on the subject, the grade will include the level achieved in written and oral exams and in the preparation and oral presentation of seminars and projects as homework assignments. The subjects Seminar I to V, Skills in Scientific Work I and II, Research I to III and the Doctoral Dissertation are graded as "passed" or "failed". The work of graduates is also monitored after the doctorate is completed, and in this way we determine the adequacy of the knowledge and skills acquired in practice.

General competences

Upon the completion of studies, doctoral graduates will be capable of creative, independent scientific, research and development work and of solving scientific and development problems at future employers. They will gain the capacity to understand and critically assess solutions for demanding and complex problems. They will be capable of creatively and independently addressing scientific and research problems, critically assessing research results, developing new research methods and transferring new technologies and knowledge into practice. They will be able to plan the development of solutions to complex problems, prepare adequate project documentation and lead and participate in implementing research and development projects.

Subject-specific competences

Doctoral students will gain the ability to use modern computer and IT methods and procedures in solving R&D problems, the ability to place computer and information science in the wider social context, the ability to use engineering approaches in solving complex problems, communication skills and the ability to report on work and results to world computer scientists and society. Additional subject-specific competences are set out under the syllabus for each subject separately (see syllabus).

Admission requirements

Pursuant to the provisions of the Act Amending the Higher Education Act, in force since 9 September 2006, enrolment in the postgraduate third-cycle study programme Computer and Information Science is open to students who have completed:

- a second-cycle study programme,
- a study programme leading to professions regulated by EU directives, or another integrated master's degree programme consisting of 300 ECTS credits,
- a programme leading to an academic higher education qualification, adopted before 11 June 2004,

- a professional higher education programme adopted prior to 11 June 2004 and a study programme to obtain a specialised qualification. Before enrolment, these candidates must complete course units consisting of a maximum of 60 ECTS credits in the second-cycle programme in Computer and Information Science. The study requirements (selection of courses) are determined for such candidates by the Faculty's Study Committee, which takes into account the candidate's field of education (type of programme the candidate has completed),
- a study programme leading to a master of science degree. Candidates will have study requirements in the scope of 60 ECTS credits recognised.

Students from abroad applying for the doctoral programme are subject to the same conditions as Slovenian citizens, provided they have completed an equivalent education abroad. The equivalence of education to continue studies is determined in accordance with the UL Statutes, and the procedure is led by the authorised official of the UL, while the senate of the member institution or UL Senate perform the substantive decision.

Selection criteria for limited enrolment

Any restrictions on enrolment in the doctoral programme will be decided on by the Senate, on the proposal of the Vice Dean for Research. The selection of candidates will be based on the GPA or average study grades (50%) and the bachelor's or master's thesis grade (50%).

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.

http://www.uni-lj.si/o_univerzi_v_ljubljani/organizacija__pravilniki_in_porocila/predpisi_statut_ul_in_pravilniki/2013071115595174/

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 the UL FRI Committee for Research and Doctoral Studies and on its recommendation approved by the Faculty Senate.

Assessment methods

FRI adheres to the criteria and method of verification and assessment of learning outcomes as defined in the UL Statutes, accessible at http://www.uni-lj.si/o_univerzi_v_ljubljani/predpisi_statut_ul_in_pravilniki/statut_univerze_v_ljubljani.aspx.

Verification and assessment of learning outcomes at FRI are regulated in detail by the Study Rules and the Rules on the Doctoral Study Programme. For greater accessibility and more detailed explanations of individual procedures, UL FRI has issued Instructions for Doctoral Students of Computer and Information Science and a diagrammatical plan of doctoral studies; these documents can be viewed at http://www.fri.uni-lj.si/si/izobrazevanje/informacije/pravilniki/.

Since foreign students will also be pursuing doctoral studies, all forms and the rules are also translated into English. These documents are available online at http://www.fri.uni-lj.si/en/phd/forms_and_procedure/.

The heads, Committee for Research and Doctoral Studies and those heading subject courses analyse the learning outcomes and students' acquired competences, and propose possible changes and measures to eliminate deficiencies (overhaul content, change the workload, those in charge, literature, teaching methods and conditions for advancement). Regarding difficulties and necessary measures, upon the

conclusion of lectures a discussion is held annually at the Pedagogical Conference which is normally attended by all teaching staff at FRI. The Faculty management and Committee for Research and Doctoral Studies are bound to implement measures stemming from the findings of the Pedagogical Conference. Assessment criteria are applied consistently at the Faculty.

Requirements for progression through the course

- Students must meet requirements totalling 55 ECTS credits, i.e. all requirements of the first year with the exception of one in-depth or elective subject, to progress from the first year to the second year.
- Students must meet requirements totalling 115 ECTS credits, i.e. all requirements of the first two years with the exception of one in-depth or elective subject, to progress from the second year to the third year, and must have a confirmed positive assessment from the Committee for Monitoring Doctoral Students regarding the appropriateness of their doctoral dissertation topic at the FRI Senate.
- In order to progress from the third to the fourth year, students must complete all requirements of the first three years totalling 180 ECTS, and have their doctoral dissertation topic confirmed by the UL Senate.

Requirements for transferring between programmes

In accordance with the valid Criteria for Transferring Between Programmes, a student ceasing studies in the programme in which they enrolled and continuing in the doctoral programme Computer and Information Science is deemed to be a transfer 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 Transfer Credit System (ECTS) from the first study programme that are related to obligatory courses of the second study programme. Requests from candidates to transfer to the doctoral programme Computer and Information Science will be processed individually by the Faculty's Committee for Research and Doctoral Studies, in accordance with the Statutes of the University of Ljubljana.

Requirements for completing the study programme

The condition for completion of the study programme and acquiring the academic title of doctor of science is the successful completion of all of the study requirements from the programme, enrolment in all four years of doctoral study and a successful defence of their doctoral dissertation. Pursuant to Article 127 of the UL Statutes, students also have the option of more rapid advancement and early conclusion of studies.

Doctoral candidates must publish at least one scientific article in the field of their doctorate in a journal indexed by the SCI. The doctoral candidate must be the lead author of the article. The scholarly article must be published or accepted for publication before the doctoral dissertation is submitted for evaluation.

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)

- doktor znanosti

Professional or academic title (female)

- doktorica znanosti

Professional or academic title (abbreviated)

- dr.

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.	63802	Scientific Skills 1	Tomaž Curk	30	20	20		55		125	5	Fall	No
2.	63804	Seminar 1	Danijel Skočaj		20			105		125	5	Fall	No
3.	0001	Computer science course (elective)		15	20	15		75		125	5	Fall	Yes
4.	63836	Research 1							875	875	35	Fall, Spring	No
5.	63805	Seminar 2	Zoran Bosnić		20			105		125	5	Spring	No
6.	0002	General elective course		15	20	15		75		125	5	Spring	Yes
		Total		60	100	50	0	415	875	1500	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.	63806	Seminar 3	Danijel Skočaj		20			105		125	5	Fall	No
2.	0001	Computer science course (elective)		15	20	15		75		125	5	Fall	Yes
3.	63837	Research 2							1000	1000	40	Fall, Spring	No
4.	63807	Seminar 4	Zoran Bosnić		20			105		125	5	Spring	No
5.	0002	General elective course		15	20	15		75		125	5	Spring	Yes
		Total		30	80	30	0	360	1000	1500	60		

YEAR 3

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63838	Research 3							1500	1500	60	Fall, Spring	No
		Total		0	0	0	0	0	1500	1500	60		

YEAR 4

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63803	Scientific skills 2	Tomaž Curk	5	10			110		125	5	Fall	No
2.	63808	Seminar 5	Tomaž Curk		40			210		250	10	Spring	No
3.	63800	Doctoral dissertation						1125		1125	45	Fall, Spring	No
		Total		5	50	0	0	1445	0	1500	60		

Year 1 and Year 2, Computer science course (elective)

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63824	Selected Topics in Architectures and Algorithms 1	Borut Robič	15	20	15		75		125	5	Spring	Yes
2.	63825	Selected Topics in Architectures and Algorithms 2	Borut Robič	15	20	15		75		125	5	Spring	Yes
3.	63826	Selected Topics in Informatics 1	Marko Bajec	15	20	15		75		125	5	Fall	Yes

4.	63827	Selected Topics in Informatics 2	Marko Bajec	15	20	15		75		125	5	Fall	Yes
5.	63828	Selected Topics in Mathematical Methods in Computer Sciences 1	Polona Oblak	30	15	15		65		125	5	Spring	Yes
6.	63829	Selected Topics in Mathematical Methods in Computer Sciences 2	Polona Oblak	30	15	15		65		125	5	Spring	Yes
7.	63830	Selected Topics in Computer Systems 1	Miha Mraz	15	20	15		75		125	5	Fall	Yes
8.	63831	Selected Topics in Computer Systems 2	Miha Mraz	15	20	15		75		125	5	Fall	Yes
9.	63832	Selected Topics in Software Development 1	Franc Jager	15	20	15		75		125	5	Fall	Yes
10.	63833	Selected Topics in Software Development 2	Franc Jager	15	20	15		75		125	5	Fall	Yes
11.	63834	Selected Topics in Artificial Intelligence 1	Marko Robnik Šikonja	15	20	15		75		125	5	Spring	Yes

12.	63835	Selected Topics in Artificial Intelligence 2	Marko Robnik Šikonja	15	20	15		75		125	5	Spring	Yes
		Total		210	230	180	0	880	0	1500	60		

Year 1 and Year 2, General elective course

				Contact hours									
No.	**Course code**	**Study unit**	**Lecturer**	**Lectures**	**Seminar**	**Tutorial**	**Laboratory work**	**Field work**	**Individ. work**	**Total**	**ECTS**	**Semester**	**Elective**
1.	63818	Izbrana poglavja iz računalništva in informatike	Tomaž Curk	15	20	15		75		125	5	Spring	Yes
		Total		15	20	15	0	75	0	125	5		