

Computer science master study programme, second Bologna cycle

COURSE STRUCTURE of the study programme

The study programme consists of 12 courses, 3 seminars, and a Master's thesis. Courses are divided into core courses (4 courses), internal elective courses (6 courses), and external elective courses (2 courses).

Core courses expand and deepen fundamental (general) knowledge in the field of computer science and informatics. To ensure comprehensive coverage of the discipline, core courses are divided into Blocks A and B.

Internal elective courses serve a dual purpose: as discipline-specific courses in computer science, informatics, and mathematics, they deepen specialized knowledge, while also enabling students who did not acquire sufficient general knowledge in computer science and informatics during their undergraduate studies to compensate for this gap. This is particularly important for students intending to continue their studies at the doctoral level.

External elective courses may be selected from any study programme in the fields of social sciences, humanities, and natural sciences offered by other faculties. Students may also choose to select courses from the pool of internal elective courses instead of external electives.

Students may register the topic of their Master's thesis upon enrolment in the second year. Prior to the defence of the Master's thesis, all remaining academic requirements (90 ECTS) must be completed. The topic of the Master's thesis is first presented publicly in a seminar, after which the student prepares the thesis and subsequently defends it in a public oral defence.

To complete the programme, a minimum of 120 ECTS must be obtained, including all academic requirements within individual courses of the study programme, as well as the preparation and defence of the Master's thesis.

The following section presents the structure of the study programme by year, as well as the compulsory and internal elective courses of the programme.

Table 1: Structure of the study programme

Year of study	Study obligation	ECTS-credits (ECTS)	
		ECTS	ECTS/ Year of study
1.	Basic Course I – Core A	6	60
	Basic Course II – Core A	6	
	Basic Course III – Core B	6	
	Basic Course IV – Core B	6	
	Elective Course I – Internally Selected	6	
	Elective Course II – Internally Selected	6	
	Elective Course III – Internally Selected	6	
	Elective Course IV – Externally Selected	6	
	Seminar I	6	
	Seminar II	6	
2.	Elective Course V – Internally Selected	6	60
	Elective Course VI – Internally Selected	6	
	Elective Course VII – Internally Selected	6	
	Elective Course VIII – Externally Selected	6	
	Seminar III	6	
	Master's Thesis	30	

Legend:

ECTS credits (ECTS) = credit points awarded under the European Credit Transfer and Accumulation System (ECTS). The credit system facilitates student mobility and the mutual recognition of completed academic requirements.

ECTS credits represent an average estimate of the time required to complete a course and include both organized forms of instruction (lectures, seminars, seminar and laboratory exercises, fieldwork, practical training, etc.) and the student's independent work (exam preparation and other course-related obligations, etc.). One (1) ECTS credit corresponds to 25 to 30 hours of study workload. Credits are awarded upon the successful completion of the requirements for an individual course.

Table 2: Basic Courses of the Study Programme

No.	Course	ECTS
1.	Selected Topics in Theoretical Computer Science (Core A)	6
2.	Selected Topics in Theory of Algorithms (Core A)	6
3.	Intelligent Systems (Core B)	6
4.	Applied Statistics (Core B)	6

Table 2 lists **the core courses** offered in the current or previously offered in the preceding academic year. Each academic year, the faculty **offers only a selection of core courses** from a broader pool, taking into account its staffing and financial capacities, as well as student interest in individual courses. The final list of core courses offered to students for the upcoming academic year is published prior to the start of enrolment for that year.

In the first year, students select a total of four core courses, two from Block A and two from Block B.

ELECTIVE courses

Students select elective courses in the first and second year of study. All courses carry 6 ECTS.

In the first year, students select three internal elective courses and one external elective course; in the second year, they likewise select three internal elective courses and one external elective course.

Table 3: Internal elective courses of the study programme

No.	Course	ECTS
1.	Graph Algorithms	6
2.	Computer Vision	6
3.	Selected Topics in Information Visualisation	6
4.	Selected Topics in Intelligent Systems Applications	6
5.	Selected Topics in Digital Signal Processing and Analysis	6
6.	Computational Social Science	6

The group of **internal elective courses** across both years consists of six courses selected by students from the list in Table 2. As an **internal elective**, students may also choose any course offered within the Master's study programmes in [Data Science](#) and [Mathematical Sciences](#), provided that the course is not listed among the core or internal elective courses of the Computer Science and Informatics study programme.

However, UP FAMNIT **offers only a selection of elective courses** from the broader pool each academic year. In doing so, the faculty takes into account its staffing and financial capacities, as well as student interest in individual courses. The final list of elective courses offered to students for the upcoming academic year is published prior to the start of enrolment for that year.

Students may also select non-chosen core courses from Blocks A and B as elective courses.

External elective courses may be selected within accredited study programmes at higher education institutions in Slovenia or abroad. External electives enable students to broaden their knowledge in selected areas of the social sciences, humanities, and natural sciences and/or to pursue more in-depth study within their discipline. Students may also choose to select courses from the pool of internal elective courses instead of external electives.

During the course of study, the student completes three **seminars**. At least one must be a project seminar and one a research seminar; the third seminar may be either a project or a research seminar (at the student's discretion).

Seminar courses constitute a central component of the programme, where students become familiar with modern methods of work in technologically demanding environments and gather information from various sources, such as journals, conference proceedings, and online materials. Research seminars develop research skills, the implementation of prototypes, and scientific communication, while project seminars focus on teamwork, managing industry requirements, and problem-solving in software system development. Work within seminars enables students to explore new technologies and academic prototypes that represent future trends in computer science.

Within seminar courses, students gain experience with modern approaches to work in technologically advanced environments, where, in addition to classical knowledge in computer science and mathematics, it is necessary to collect information from diverse sources (e.g., journals, conference proceedings, and online publications).

Within research seminars, students are introduced to the fundamental principles of research work, the implementation of research prototypes, and scientific communication (papers, presentations). In project seminars, students acquire techniques for collaborative project work, become familiar with industry requirements in software development, and address challenges related to the creation of final products. Through seminar work, students are exposed both to emerging technologies in software systems and to academic prototypes that represent future technological developments.

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