

University of Maribor
Faculty of Natural Sciences and Mathematics

Information on the undergraduate programme
Educational Computer Science

A) General description

QUALIFICATION AWARDED

Undergraduate programme of university studies Educational Computer Science

Qualification awarded: University degree in Educational Computer Science.

Duration of study: 3 years

ADMISSION REQUIREMENTS

Undergraduate university programme:

- a) a successfully completed Matura examination, or
- b) a successfully completed vocational leaving exam and exam from one of the subjects of the Matura examination; the selected subject can not be one of the subjects passed on the vocational leaving exam; or
- c) Successfully finished secondary school before June 1, 1995.

In case of enrolment limitations, applicants under a) are admitted according to their GPA on the Matura examination or final exam (60% of the points) and their overall GPA in the third and the fourth year of secondary school (20% of the points) and overall grade of mathematics in the third and the fourth year (20% of the point). Applicants under b) are admitted to their GPA on the vocational leaving exam (20% of the points), their overall GPA in the third and the fourth year of secondary school (20% of the points), their overall GPA in the third and the fourth year of secondary school in mathematics (40% of the points) and GPA of the selected subject in Matura examination (20% of the point). Applicants under c) are admitted according to their GPA at the final examination (60% of the points), their overall GPA in the third and the fourth year of secondary school (20% of the points), their overall GPA in the third and the fourth year of secondary school in mathematics (20% of the points).

EDUCATIONAL AND PROFESSIONAL GOALS

Computer science is one of the most important scientific areas in the information era we live in. For the proper development of EU it is important to further develop sciences from the area of natural sciences and mathematics. The influence of Computer Science can be found in all leading scientific and research areas. The first level study programme Educational Computer Science gives the base for further education for teachers of computer science and other experts with computer scientific knowledge.

The main goal of this programme is to give the student the base knowledge in computer science and educate them in those areas of pedagogics, didactics and psychology which are important for the continuation of the studies on the second level or a possible employment after the completed first level. A graduate student of this programme is also educated in the areas of natural sciences and mathematics. The elective subjects enable the student to deepen the knowledge in the areas of interest and importance for the later employment. The degree in this programme enables the employment in companies, organizations and institutions, who require experts with the combination of knowledge in computer science and educational sciences, e.g. system administrator, laboratory assistant, or continuation of the studies at the second level.

The main general competences achieved by the graduates:

- The students gain the ability to think analytically and understand complex systems that enable the graduate to embed into diverse interdisciplinary groups.
- The are skilled in communication with others as well as in team work with experts in the same as well as in other areas of research.
- The graduates are able to cooperate in research projects intended to improve the quality of educational work.
- The students are able to critically apply the skills in their own work.
- The students are skilled in planning their own professional development, are able to follow the development of sciences important for their own work and include that progress into their own work and ideas critically.
- The graduates are able to find solutions to their problems by using external sources and scientific methods.
- The students are able to self-educate in use sources in at least one foreign language.
- The students are skilled in using information-communicational technologies in education and everyday situations.
- The students are open to and able to respect other people's cultural, religious and ethical differences.

The main specific competences achieved by the graduates:

- The graduates are able to understand the important facts, theoretical and practical concepts from the area of computer science.
- The graduates know and are able to choose tools necessary for quality work in the area of computer systems and user software.
- The graduates are able to communicate their knowledge and understanding of computer scientific concepts and procedures to others.
- The graduates understand and are able to use basic strategies with computer solving of problems.
- The graduates know and are able to use education-specific topics connected with the area of computer science.
- The graduates can recognize and use different forms of data and information.
- The graduates are skilled in using proper expert language in the area of computer science.
- The graduates are able to understand and solve problems in computer science in both quality and quantity levels.
- The graduates are qualified for integrating knowledges of different natural sciences.

ACCESS TO FURTHER STUDIES

Graduates of the undergraduate university programme Educational Computer Science can continue their studies at the second level leading to the second bologna degree. Graduates of the postgraduate level will be able to continue the studies at a higher level leading to the Doctor degree.

COURSE STRUCTURE DIGRAM WITH CREDITS

Complete curricula of the undergraduate university programme of the Educational Computer Science are given in the following pages. All the courses (obligatory and elective) are given together with the semester of study, the amount and type of the contact hours and the assigned number of the ECTS credits. The abbreviations in the curriculum have the following meaning:

L – Lectures

EL – experimental lectures

S – Seminar

T – Tutorial

LW – lab work

FW – field work

Undergraduate university programme Educational Computer Science

1st year, 1st semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	Fundamentals of Computer Science and Informatics	45			45		90	120	210/7
2	Discrete Structures	45		30			75	75	150/5
3	Common course 1**	22,5		15			37,5	52,5	90 / 3*
	Cummulative	112,5		45	45		202,5	247,5	450/15

* Given hours and ECTS represent only those for this programme, the same amount is achieved on the second programme.

**See the table of Common courses.

1st year, 2nd semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
4	Programming II	30			45		75	105	180/6
5	Application software in education	45			30		75	105	180/6
6	Common course 2**	22,5		15			37,5	52,5	90/3*
	Cummulative	97,5		15	75		187,5	262,5	450/15

* Given hours and ECTS represent only those for this programme, the same amount is achieved on the second programme.

**See the table of Common courses.

2nd year, 3rd semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
7	Algorithms and data structures	30		15	30		75	105	180/6
8	Computer architecture	45			30		75	105	180/6
9	Psychology of developement and learning	22,5	7,5	7,5			37,5	52,5	90/3*
	Cummulative	97,5	7,5	22,5	60		187,5	262,5	450/15

* Given hours and ECTS represent only those for this programme, the same amount is achieved on the second programme.

2nd year, 4th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
10	ICT	15			15		30	30	60/2*
11	Human-Computer Interaction	30			45		75	105	180/6
12	Fundamentals of Databases	30	15		15		60	60	120/4
	Elective Course 1**	15			22,5		37,5	52,5	90/3*
	Cummulative	90	15		97,5		202,5	247,5	450/15

* Given hours and ECTS represent only those for this programme, the same amount is achieved on the second programme.

**See the table of elective courses for this year / semester.

3rd year, 5th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
16	Network centric computing	30			45		75	105	180/6
17	Fundamentals of Information Systems	30	15		15		60	60	120/4
18	Pedagogy	15	7,5				22,5	37,5	60/2*
	Elective Course 2**	15			22,5		37,5	52,5	90/3*
	Cummulative	135	15		105		255	345	450/15

* Given hours and ECTS represent only those for this programme, the same amount is achieved on the second programme.

**See the table of elective courses for this year / semester.

3rd year, 6th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
20	System Administration	30			45		75	105	180/6
21	Web applications in education	30			30		60	60	120/4
22	Didactics	15	7,5				22,5	37,5	60/2*
	Elective Course 3**	15			22,5		37,5	52,5	90/3*
	Cummulative	90	7,5		97,5		195	255	450/15**

* Given hours and ECTS represent only those for this programme, the same amount is achieved on the second programme.

**See the table of elective courses for this year / semester.

Common Courses

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	Physics	30	30		15		75	105	180/6
2	Chemistry	45			30		75	105	180/6
3	Mathematics	45		30			75	105	180/6
4	Numerical problem solving	30			45		75	105	180/6
5	Basic concepts of design and technology	30	15		30		75	105	180/6
6	Modern biology	30	30				75	105	180/6

Elective Courses

Elective Courses of the 2nd year, 4th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	System software	30			45		75	105	180/6
2	Web programming	30			45		75	105	180/6

Elective Courses of the 3rd year, 5th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	Operating systems	45			30		75	105	180/6
2	Computer graphics	30			45		75	105	180/6

Elective Courses of the 3rd year, 6th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	Programming Paradigms	30			45		75	105	180/6
2	Mathematical Modelling	45	15		15		75	105	180/6

FINAL EXAMINATION

There is no final examination.

EXAMINATION AND ASSESMENT REGULATIONS

The examinations are usually written and/or oral. Some of the courses involve the preparation of a seminar work which is usually defended by an oral presentation. The oral examination is usually preconditioned by laboratory attendance, the successful completion of the written exam and the seminar or laboratory work where required.

Timetables of examinations are issued yearly by the Faculty senate at the beginning of the academic year and are published on the faculty web page and on the notice boards. There are at least 5 examinations for each course per academic year and students are free to choose the date of examination. The students need to register for examination 7 days before the examination date. The examination can be cancelled no later than 3 days before the examination date. The use of calculators, literature and other items during the examination is determined by the lecturer and may vary from course to course.

ECTS DEPARTMENTAL CO-ORDINATOR

ECTS departmental co-ordinator is the actual head of the department.

Information on the degree programme
Educational Computer Science

B) List of Subjects

Undergraduate university programme Biology

Code	Course title	Type	ECTS
	Algorithms and data structures	O	6
	Application software in education	O	6
	Basic concepts of design and technology	E	6
	Chemistry	E	6
	Computer Architecture	O	6
	Computer Graphics	E	6
	Didactics	O	4
	Discrete structures	O	5
	Fundamentals of Computer Science and Informatics	O	7
	Fundamentals of Databases	O	4
	Fundamentals of Information Systems	O	4
	Human-Computer Interaction	O	6
	ICT	O	4
	Mathematical Modelling	E	6
	Mathematics	E	6
	Modern biology	E	6
	Network centric computing	O	6
	Numerical problem solving	E	6
	Operating systems	E	6
	Pedagogy	O	4
	Physics	E	6
	Programming II	O	6
	Programming Paradigms	E	6
	Psychology of development and learning	O	6
	System administration	O	6
	System Software	E	6
	Web application in education	O	4
	Web programming	E	6

O ... obligatory course E ... elective course