

University of Maribor
Faculty of Natural Sciences and Mathematics

Information on the 2nd degree Bologna Study Programme
Educational Design
Single masters programme

QUALIFICATION AWARDED

- **Magister profesor tehnike / Magistrica profesorica tehnike**

Duration of studies: 2 years

ADMISSION REQUIREMENTS

Master programme:

- a) a successfully completed 1st degree Study Programme of Technical Science direction with the total of 180 ECTS;
- b) a successfully completed 1st degree Study Programme of natural sciences direction with the total of 180 ECTS, if carried out prior to entry academic requirements that are essential for the continuation of the study. These commitments include 24 ECTS, and candidates obtained prior to enrollment in the Masters program with the performance of the following differential exams: Materials and technologies, Technical drawing, Mechanical elements, Electrical engineering;
- c) a successfully completed higher education of any Technical Science direction, approved before 11. 6. 2004;
- d) a successfully completed higher education of any Natural Science direction, approved before 11. 6. 2004, if carried out prior to entry academic requirements that are essential for the continuation of the study. These commitments include 24 ECTS, and candidates obtained prior to enrollment in the Masters program with the performance of the following differential exams: Materials and technologies, Technical drawing, Mechanical elements, Electrical engineering;
- e) a successfully completed equivalent education abroad.

In case of enrolment limitations, candidates will be selected according to the average rating of undergraduate studies.

Placements: regular: 30, non-regular: 30

THE PROVISIONS OF CROSSING BETWEEN PROGRAMMES

Under the criteria for the transitions a student can enter the 2nd year of two-stream 2nd degree Bologna Study Programme Educational Design only if he/she meet the conditions:

- a) a graduate of a one- or two-stream pedagogical university study program in direction of Educational Design, accepted before 11. 6. 2004, which is recognized with 60 ECTS at the entry in the study program;
- b) a graduate of a one- or two-stream non-pedagogical university study program of the Technical science direction, accepted before 11. 6. 2004, which is recognized with 30 ECTS at the entry in the study program. The student is presented with the following obligatories: Pedagogy (4 ECTS), Didactics (4 ECTS), Psychology of development and learning (6 ECTS), and others subjects, which are necessary to graduate on the 2nd degree study program Educational Design;
- c) a graduate of a one- or two-stream non-pedagogical university study program in direction of natural sciences, accepted before 11. 6. 2004, which is recognized with 15 ECTS at the entry in the study program. The student is presented with the following

obligatories: Pedagogy (4 ECTS), Didactics (4 ECTS), Psychology of development and learning (6 ECTS), and others subjects, which are necessary to graduate on the 2nd degree study program Educational Design;

- d) a graduate of a one- or two-stream pedagogical higher professional study program and study program leading to specialization of Technical science direction, accepted before 11. 6. 2004, which is recognized with 60 ECTS at the entry in the study program;
- e) a graduate of a one- or two-stream non-pedagogical higher professional study program and study program leading to specialization in the Technical science direction, accepted before 11. 6. 2004, which is recognized with 30 ECTS at the entry in the study program. The student is presented with the following obligatories: Pedagogy (4 ECTS), Didactics (4 ECTS), Psychology of development and learning (6 ECTS), and others subjects, which are necessary to graduate on the 2nd degree study program Educational Design;
- f) a graduate of a one- or two-stream non-pedagogical higher professional study program and study program leading to specialization in direction of natural sciences, accepted before 11. 6. 2004, which is recognized with 15 ECTS at the entry in the study program. The student is presented with the following obligatories: Pedagogy (4 ECTS), Didactics (4 ECTS), Psychology of development and learning (6 ECTS), and others subjects, which are necessary to graduate on the 2nd degree study program Educational Design.

Transition to 2nd degree Bologna Study Programme Educational Design is possible from 2nd degree study programmes of technical and natural sciences direction, if a student meets the conditions for entry of the proposed course and if a sufficient number of available study places. The student is presented with the following obligatories: Pedagogy (4 ECTS), Didactics (4 ECTS), Psychology of development and learning (6 ECTS), and others subjects, which are necessary to graduate on the 2nd degree study program Educational Design. The academic requirements that the student completed at the previous course of study, may be recognized.

EDUCATIONAL AND PROFESSIONAL GOALS

Basic goals of the programme

The Master in Educational Design will acquire:

- the basic professional knowledge of the technical field, which is important for education of the technology;
- the basic pedagogical, psychological and special didactical knowledge, important for working in education. Those knowledge offers wide employment possibility in the design and technology fields, where tolerant and democratical work with people is acquired;
- the mindset that leads to a systematic treatment of a wide range of problems;
- the specific knowledge for further study or work, chosen from the list of elective courses, by a student;
- emphasize the importance, benefits and social value of teamwork;
- develop critical state and critical self-awareness.

Common competences achieved through the programme

Competencies are defined as a combination of knowledge, skills and attitudes appropriate to the context (the EU's Official Gazette No. 394/10, 2006):

- understanding and application of curriculum theory and basic didactical knowledge;
- the ability to analysis and synthesis solutions and professional outlook and teaching problems;
- integration of interdisciplinary content;
- the ability to apply knowledge in practice for solving various problems;
- the ability to encourage creative thinking of the pupils;
- the ability to research approach and focus on problem solving and responsible guidance of its own professional development in lifelong learning;
- the ability to creative and autonomous operation;
- knowledge and understanding of the legality of development, differences and needs of individuals;
- knowledge and understanding of diversity and multiculturalism, consideration of non-discrimination at work;
- qualification for the research approach;
- the capacity to use ICT for teaching and other professional work and development of information literacy at students;
- the ability to peer dialogue, international cooperation and the creation of project management;
- the capacity for reflection and evaluation of the results of their work;
- good knowledge of his profession, and regulations governing the operation of schools;
- using previously acquired theoretical knowledge in practical situations.

Subject specific competences achieved through the programme

- Knowledge and application of established technical terminology;
- professionally mastered the curriculum, content and concepts of higher education, secondary, vocational and technical content of all primary school subjects to create such learning conditions, which allows students to build knowledge of quality (durability, portability, integrity);
- the sovereign control of specific organizational forms of teaching technical subjects: the creation of project days, mentoring in research tasks, cross-curricular planning and implementation of instruction, research;
- in-depth knowledge of modeling and design;
- knowledge and use of modern numerical procedures for the design of machine parts and structures;
- knowledge and use of conventional and modern materials in the design and manufacture of products;
- knowledge and use of conventional and modern processing technologies (CAM, CIM, CQM, robotics ...);
- knowledge and application of methods for programming modern computer aided machinery and equipment;
- knowledge and use of modern design methods, processes and systems;
- knowledge and use of calculations, financial calculations and financial analysis in the design of products;
- organize and conduct training.

ACCESS TO FURTHER STUDIES

Graduates of the master university programme “*Educational Design*” are able to continue their studies at the third level, leading to the Doctor degree.

COURSE STRUCTURE DIGRAM WITH CREDITS

Complete curricula of the master university programme “*Educational Design*” 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

S – seminar

T – tutorial

LW – lab work

IW – independent work

The master study programme Educational Design

1st year, 1st semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	SW	LW			
1.	Didactic of technology education I	obligatory	A. Papotnik	30	20		20	70	140	210/7
2.	Modelling and Design	obligatory	S. Glodež	30	20		20	70	140	210/7
3.	Robotics in engineering	obligatory	N. Muškinja	30	15		15	60	120	180/6
4.	Pedagogy	obligatory	M. Pšunder	30	15			45	75	120/4
5.	Psychology of development and learning	obligatory	K. Bakračević Vukman	30	15	15		60	120	180/6
Total hours/ ECTS				150	85	15	55	305	595	900/30

1st year, 2nd semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	SW	LW			
6.	Advanced Materials and technologies	obligatory	B. Aberšek	30	15		15	60	120	180/6
7.	Teaching practicum	obligatory	B. Aberšek	15	30	25		70	80	150/5
8.	Pedagogical practice for technology education I.	obligatory	A. Papotnik	30	6 ¹⁾		10 ¹⁾	46	194	240/8
9.	Modern approaches of dimensioning	obligatory	S. Glodež, Z. Ren	30	20		20	70	140	210/7
10.	Didactics	obligatory	M. Ivanuš Grmek	30	15			45	75	120/4
Total hours/ ECTS				135	86	25	45	291	609	900/30

¹⁾ Individual work with professor.

2nd year, 3rd semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	SW	LW			
11.	Didactic of technology education II	obligatory	A. Papotnik	30	20		20	70	110	180/6
12.	Electrical engineering in energetics and technology	obligatory	N. Muškinja	30	15		15	60	120	180/6
13.	Engineers pedagogy	obligatory	B. Aberšek	30	15		15	60	120	180/6
14.	Computer maintenance	obligatory	A. Vesel	30	15		15	60	120	180/6
15.	Elective course ^{2), 4)}	elective		15	15			30	60	90/3
16.	Didactical elective course ^{3), 4)}	elective		15	15			30	60	90/3
Total hours/ ECTS				150	95		65	310	590	900/30

²⁾ Students choose an elective course totaling at least 3 ECTS. The elective course can be chosen from the list of elective courses of the study programme *Educational Design* or from the list of elective courses of any master study programme on any other home or foreign university.

³⁾ Students choose didactic elective course totaling at least 3 ECTS. The elective course can be chosen from the list of didactic elective courses of the study programme *Educational Design* or from the list of didactic elective courses of any master study programme on any other home or foreign university.

⁴⁾ The course is carried out in full contact hours only if at least 10 students enrolled. If fewer than 10 students, the course will be held in the form of individual consultations.

2nd year, 4th semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	SW	LW			
17.	Pedagogical practice for technology education II.	obligatory	A. Papotnik	30	6 ⁵⁾		10 ⁵⁾	46	194	240/8
18.	Elective course ^{6), 4)}	elective		15	15			30	60	90/3
19.	Didactical elective course ^{7), 4)}	elective		15	15			30	60	90/3
20.	Master thesis ⁸⁾	obligatory			15				480	480/16
Total hours/ ECTS				60	51		10	121	779	900/30

⁵⁾ Individual work with professor.

⁶⁾ Students choose an elective course totaling at least 3 ECTS. The elective course can be chosen from the list of elective courses of the study programme *Educational Design* or from the list of elective courses of any master study programme on any other home or foreign university.

⁷⁾ Students choose didactic elective course totaling at least 3 ECTS. The elective course can be chosen from the list of didactic elective courses of the study programme *Educational Design* or from the list of didactic elective courses of any master study programme on any other home or foreign university.

⁸⁾ Master thesis have to be interdisciplinary work, containing pedagogical-didactical and technical content, valued 16 ECTS. 8 ECTS of them considered in the total quota of teaching content of the whole study program.

Elective Courses

List of elective courses of the master study programme *Educational Design*:

Course number	Course title	L	S	T	LW	Total contact hours	Individual work	Total hours/ ECTS
1	Drives	15	15			30	60	90/3
2	Drawing in technology documentation	15	15			30	60	90/3
3	Computer based Measurement Systems	15	15			30	60	90/3
4	Modelling and Identification	15	15			30	60	90/3
5.	Energetic and environment	15	15			30	60	90/3
6	Basics of structural programming	15	15			30	60	90/3
7	Layered Technologies	15	15			30	60	90/3
8	Computer Aided Technologies	15	15			30	60	90/3
9	Strategies and methods of maintenance	15	15			30	60	90/3

List of didactic elective courses of the master study programme *Educational Design*:

Course number	Course title	L	S	T	LW /LD	Total contact hours	Individual work	Total hours/ ECTS*
1	Fundamental School Ergonomics	15	15			30	60	90/3
2	Ethics	15	15			30	60	90/3
3	Philosophy of Science	15	15			30	60	90/3
4	Communication and the team work	15	15			30	60	90/3
5	Scientific writing	15	15			30	60	90/3
6	Rhetorics and public appearance	15	15			30	60	90/3
7	Learning strategies	15	15			30	60	90/3
8	Selected topics in school discipline	15	15			30	60	90/3
9	Psihology for teachers	15	15			30	60	90/3
10	Information management in education	15	15			30	60	90/3
11	Web services in education	15	15			30	60	90/3
12	Composing e-materials	15	15			30	60	90/3
13	E-education in education of engineering	15	15			30	60	90/3
14	Communication in education	15	15			30	60	90/3
15	Working with children with special needs	15	15			30	60	90/3

FINAL EXAMINATION

There is no final examination.

EXAMINATION AND ASSESMENT REGULATIONS

The examinations are usually written and 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 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 6 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.

List of Courses

The master study programme Educational Design

Code	Course title	Type	ECTS
1	Didactic of technology education I	O	7
2	Modelling and Design	O	7
3	Robotics in engineering	O	6
4	Pedagogy	O	4
5	Psychology of development and learning	O	6
6	Advanced Materials and technologies	O	6
7	Teaching practicum	O	5
8	Pedagogical practice for technology education I.	O	8
9	Modern approaches of dimensioning	O	7
10	Didactics	O	4
11	Didactic of technology education II	O	6
12	Electrical engineering in energetics and technology	O	6
13	Engineers pedagogy	O	6
14	Computer maintenance	O	6
15	Pedagogical practice for technology education II.	O	8
16	Drives	E	3
17	Drawing in technology documentation	E	3
18	Computer based Measurement Systems	E	3
19	Modelling and Identification	E	3
20	Energetic and environment	E	3
21	Basics of structural programming	E	3
22	Layered Technologies	E	3
23	Computer Aided Technologies	E	3
24	Strategies and methods of maintenance	E	3
25	Fundamental School Ergonomics	DE	3
26	Ethics	DE	3
27	Philosophy of Science	DE	3
28	Communication and the team work	DE	3
29	Scientific writing	DE	3
30	Rhetorics and public appearance	DE	3
31	Learning strategies	DE	3
32	Selected topics in school discipline	DE	3
33	Psihology for teachers	DE	3
34	Information management in education	DE	3
35	Web services in education	DE	3
36	Composing e-materials	DE	3
34	E-education in education of engineering	DE	3
35	Communication in education	DE	3
36	Working with children with special needs	DE	3

O - obligatory course; E - elective course; DE - didactic elective course.